

# POWER QUALITY / ENERGY ANALYZERS, METERS & LOGGERS

## THREE-PHASE POWER QUALITY ANALYZERS



### POWERPAD® III MODELS 8333 & 8336

*SD card for trend recordings and data storage,  
extensive memory for high snapshot quantity,  
captured transients/inrush and alarm events*

### SPECIFICATIONS

| MODELS                  | 8333                                                                                                                                                                                                                                           | 8336                                                                                     |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Input Terminals         | 4 voltage / 3 current                                                                                                                                                                                                                          | 5 voltage / 4 current                                                                    |
| Inputs                  | 3 voltage / 3 current                                                                                                                                                                                                                          | 4 voltage / 4 current                                                                    |
| Voltage (TRMS AC+DC)    | (2 to 1000) V                                                                                                                                                                                                                                  |                                                                                          |
| Voltage Ratio           | up to 500 kV                                                                                                                                                                                                                                   |                                                                                          |
| Current (TRMS AC+DC)    | MN93: 500 mA to 200 Aac; MN193: (0.005 to 100) Aac<br>SR193 Clamp: (1 to 1000) Aac<br>AmpFlex® or MA193 Clamps: 100 mA to 10000 Aac<br>MR193 Clamp: (1 to 1000) Aac/1300 Adc<br>SL261 Clamp: 50 mA to 100 Aac/Dc<br>Current Ratio: up to 60 kA |                                                                                          |
| Frequency (Hz)          | (40 to 69) Hz                                                                                                                                                                                                                                  |                                                                                          |
| Distribution Systems    | 1P 2W, 1P 3W, 2P 2W, 2P 3W, 2P 4W, 3P 3W, 3P, 4W, Split-Phase 2W & 3W and Aron meters                                                                                                                                                          | 1P 2W, 1P 3W, 2P 2W, 2 P 3W, 2P 4W, 3P 3W, 3P, 4W and 3P 5W, 2 ½ Element and Aron meters |
| Power Values            | W, VA, var, VAD, PF, DPF, cos $\Phi$ , tan $\Phi$                                                                                                                                                                                              |                                                                                          |
| Energy Values           | Wh, varh, VAh, VADh                                                                                                                                                                                                                            |                                                                                          |
| Harmonics               | 1 <sup>st</sup> to 50 <sup>th</sup> , Direction, Sequence; THD: 0 to 50, phase                                                                                                                                                                 |                                                                                          |
| Transients              | up to 51                                                                                                                                                                                                                                       | up to 210                                                                                |
| Flicker (Pst/Plt)       | Yes/No                                                                                                                                                                                                                                         | Yes/Yes                                                                                  |
| Unbalance               | Yes                                                                                                                                                                                                                                            |                                                                                          |
| Recording               | Yes                                                                                                                                                                                                                                            |                                                                                          |
| Alarm Mode              | 10 types; 4000 recorded                                                                                                                                                                                                                        | 40 types; 16,000 recorded                                                                |
| Peak                    | Yes                                                                                                                                                                                                                                            |                                                                                          |
| Phasor Display          | Automatic                                                                                                                                                                                                                                      |                                                                                          |
| Display                 | Color ¼ VGA TFT screen (320 x 240) diagonal 5.82 in (148 mm)                                                                                                                                                                                   |                                                                                          |
| Snapshots               | 12                                                                                                                                                                                                                                             | 50                                                                                       |
| Languages               | > 27                                                                                                                                                                                                                                           |                                                                                          |
| Communication Interface | USB                                                                                                                                                                                                                                            |                                                                                          |
| MECHANICAL              |                                                                                                                                                                                                                                                |                                                                                          |
| Battery Life            | ≤ 10 h, ≥ 15 h in Record mode                                                                                                                                                                                                                  |                                                                                          |
| Power Supply            | 9.6 V NiMH rechargeable battery pack (included)<br>External AC supply: (110/230) VAc ±10 % (50/60) Hz                                                                                                                                          |                                                                                          |
| Dimensions / Weight     | (9.8 x 7.8 x 2.6) in (249 x 198 x 66) mm / 4.3 lb (1.95 kg)                                                                                                                                                                                    |                                                                                          |
| SAFETY                  |                                                                                                                                                                                                                                                |                                                                                          |
| Safety Rating / IP      | IEC 61010, 1000 V CAT III; 600 V CAT IV / IP53                                                                                                                                                                                                 |                                                                                          |

Consult factory for NIST Calibration prices

### KIT OPTIONS

#### 8333

AS ABOVE WITH AMPFLEX®  
193 FLEXIBLE CURRENT PROBE  
(10 kA) CATALOG # 2136.11  
24 IN, RATED 600 V CAT IV

OR

AS ABOVE, MN193 CURRENT  
PROBE (5/100 A)  
CATALOG # 2136.12  
Rated 600 V CAT III

#### 8336

AS ABOVE WITH AMPFLEX®  
193 FLEXIBLE CURRENT PROBE  
(10 kA) CATALOG # 2136.31  
24 IN, Rated 600 V CAT IV

OR

AS ABOVE, MN193 CURRENT  
PROBE (5/100 A)  
CATALOG # 2136.32  
Rated 600 V CAT III



\* 3 YEAR WARRANTY ONLY APPLIES WHEN METER IS REGISTERED WITHIN 30 DAYS OF PURCHASE

# POWER QUALITY/ENERGY ANALYZERS, METERS & LOGGERS

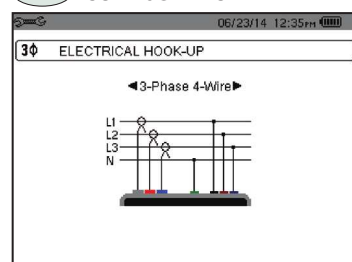
## THREE-PHASE POWER QUALITY ANALYZERS

**Captures and Records  
Transients, Events & Waveforms  
Simultaneously!**

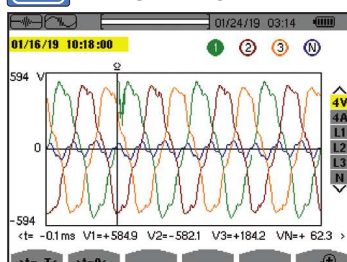
### MODELS 8333 & 8336

### Large Functional Displays

#### CONFIGURATION



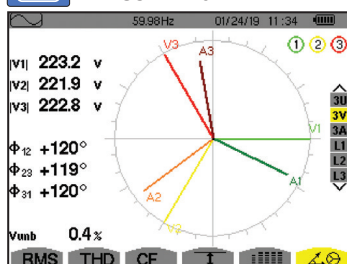
#### TRANSIENT MODE



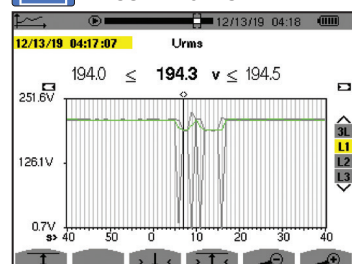
#### POWER AND ENERGY MODE



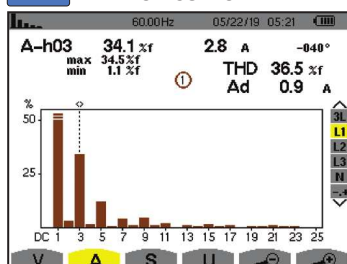
#### PHASOR DIAGRAM



#### RECORDING MODE



#### HARMONICS MODE



### FEATURES

- True RMS single-, two- and three-phase measurements at 256 samples/cycle, plus DC
- Real-time color waveforms
- Easy-to-use on-screen setup
- Automatic current probe recognition and scaling
- True RMS voltage and current measurement
- Measures DC volts, amps and power
- Displays and captures voltage, current and power harmonics to 50<sup>th</sup> order, including direction, in real-time
- Captures transients down to 1/256<sup>th</sup> of a cycle
- Stores comprehensive data base of logged data
- Phasor diagram display
- kVA, kvar and kW per phase and total
- kVAh, kvarh and kWh per phase and total
- Neutral current calculated and displayed for three-phase
- Transformer Factor K display (8333, 8336)
- Power Factor, displacement PF display
- Captures up to 210 transients (8336)
- Short term (8333) and Long term (8336) flicker display
- Phase unbalance (current and voltage)
- Harmonic Distortion (total and individual) from 1<sup>st</sup> to 50<sup>th</sup>
- Alarms, surges and sags
- Screen snapshot function captures waveforms or other information on the display
- Includes FREE DataView® software for configuring, data retrieval, real-time display, analysis and report generation

### ACCESSORIES/REPLACEMENTS

**CATALOG #2133.73** Extra Large Classic Tool Bag (18 x 9 x 12) in

**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

**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 #2140.40** BNC Adapter for AC/DC Current Probe Model SL261 and models for use with 8220, 8333, 8335, 8336, 8435, 8436 & PEL Series

**CATALOG #2140.44** (1) 10 ft (3 M) Black Lead w/(1) Black Alligator Clip (Lead rated 1000 V CAT IV 15 A, Clip rated 1000 V CAT IV 15 A, UL)

**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 #2140.77** Phase Power Adapter (8333 & 8336)

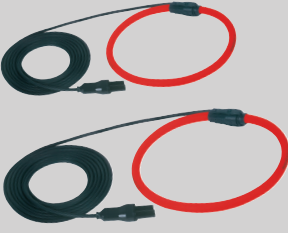
| CATALOG NO. | DESCRIPTION                                    |
|-------------|------------------------------------------------|
| 2136.10     | PowerPad® III Model 8333 (no probes)           |
| 2136.11     | PowerPad® III Model 8333 w/3 193-24-BK Sensors |
| 2136.12     | PowerPad® III Model 8333 w/3 MN193-BK Probes   |
| 2136.30     | PowerPad® III Model 8336 (no probes)           |
| 2136.31     | PowerPad® III Model 8336 w/4 193-24-BK Sensors |
| 2136.32     | PowerPad® III Model 8336 w/4 MN193-BK Probes   |



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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><br><br>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<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8436<br>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><br><br>Battery operated                                            | (1 to 1000) Aac<br>(1 to 1300) Adc  | ± 2.5 %            | -0.80 °                               | 1.6 in (41 mm)                   | PEL 102<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8436<br>8345 | 2140.28                |
| <b>SR193-BK</b><br>                                                              | (1 to 1200) Aac                     | ± 0.3 %            | 0.2 °                                 | 2.05 in (52 mm)                  | PEL 102<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8436<br>8345 | 2140.33                |
| <b>AmpFlex® 193-BK*</b><br><br>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<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8436<br>8345 | 2140.34 (24 in sensor) |
|                                                                                                                                                                     |                                     |                    |                                       | 11.46 in (291 mm) (36 in sensor) |                                                               | 2140.35 (36 in sensor) |
| <b>MiniFlex® 196-BK*</b><br><br><b>Waterproof, IP67</b><br>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<br>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><br>  | (0.5 to 240) Aac |                    | $\pm 1 \%$         | $0.8^\circ$                           | 0.78 in (20 mm)    | PEL 102<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8345 | N/A                              | 2140.32        |
| <b>MN193-BK</b><br> | 100 A            | 200 mA to 120 Aac  | $\pm 1 \%$         | $0.75^\circ$                          | 0.78 in (20 mm)    | PEL 102<br>PEL 103<br>PEL 105<br>8333<br>8336<br>8345 | N/A                              | 2140.36        |
|                                                                                                      | 5 A              | 5 mA to 6 Aac      | $\pm 1 \%$         | $1.7^\circ$                           |                    |                                                       |                                  |                |
| <b>SL261</b><br>    | 100 A            | (5 to 100) AAC/DC  | $\pm 4 \%$         | $\pm 0.5^\circ$                       | 0.46 in (12 mm)    | PEL 102<br>PEL 103<br>PEL 105<br>8333<br>8336<br>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



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

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