



# AEL-5000 系列

交 / 直流 電子負載

## 特 點

- 定電流、線性定電流、定電阻、定電壓、定功率及整流性負載工作模式
- 頻率範圍：DC, 40~440Hz
- Turbo模式可在1秒內將電子負載的電流和功率提高2倍
- 八台單相並聯最大功率180kW, 三相 $\Delta$  或 Y 接負載, 最大功率540kW, 三相 $\Delta$  或 Y 接負載可由主機同步控制
- 拉載與卸載角度控制; 0-359度全範圍都可設定
- 支援正半週或負半週抽載
- 支援SCR/TRIAC的電流調變波形, 90度前沿及後緣波形
- 選配: GPIB、RS-232、USB、LAN

**GW INSTEK**  
Simply Reliable

## AEL-5000 系列



AEL-5002-350-18.75    AEL-5006-350-56    AEL-5012-350-112.5    AEL-5015-350-112.5    AEL-5019-350-112.5    AEL-5023-350-112.5  
 AEL-5003-350-28    AEL-5008-350-75    AEL-5012-425-112.5    AEL-5015-425-112.5    AEL-5019-425-112.5    AEL-5023-425-112.5  
 AEL-5004-350-37.5    AEL-5006-425-56  
 AEL-5002-425-18.75    AEL-5008-425-75  
 AEL-5003-425-28  
 AEL-5004-425-37.5  
 AEL-5003-480-18.75  
 AEL-5004-480-28



MODEL	Power (W)		Current(Ampere)		Voltage(Volt)
	Turbo OFF	Turbo ON	Turbo OFF	Turbo ON	
AEL-5002-350-18.75	1875 W	3750W (x2)*	18.75 Arms / 56.25Apeak	37.5Arms/56.25Apeak (x2)*	50~350Vrms / 500Vdc
AEL-5003-350-28	2800W	5600W (x2)*	28 Arms / 84Apeak	56Arms/84Apeak (x2)*	
AEL-5004-350-37.5	3750 W	7500W (x2)*	37.5 Arms / 112.5Apeak	75.0Arms/112.5Apeak (x2)*	
AEL-5002-425-18.75	1875 W	3750W (x2)*	18.75 Arms / 56.25Apeak	37.5Arms/56.25Apeak (x2)*	50~425Vrms / 600Vdc
AEL-5003-425-28	2800W	5600W (x2)*	28 Arms / 84Apeak	56Arms/84Apeak (x2)*	
AEL-5004-425-37.5	3750 W	7500W (x2)*	37.5 Arms / 112.5Apeak	75.0Arms/112.5Apeak (x2)*	
AEL-5006-350-56	5600 W	11200W (x2)*	56.0 Arms / 168Apeak	112.0Arms/ 168Apeak (x2)*	50~350Vrms / 500Vdc
AEL-5008-350-75	7500 W	15000W (x2)*	75.0 Arms / 225Apeak	150.0Arms/225Apeak (x2)*	
AEL-5012-350-112.5	11250W	22500W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	
AEL-5015-350-112.5	15000W	30000W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	50~350Vrms / 500Vdc
AEL-5019-350-112.5	18750W	37500W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	
AEL-5023-350-112.5	22500W	45000W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	
AEL-5006-425-56	5600 W	11200W (x2)*	56.0 Arms / 168Apeak	112.0Arms/ 168Apeak (x2)*	50~425Vrms / 600Vdc
AEL-5008-425-75	7500 W	15000W (x2)*	75.0 Arms / 225Apeak	150.0Arms/225Apeak (x2)*	
AEL-5012-425-112.5	11250W	22500W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	
AEL-5015-425-112.5	15000W	30000W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	50~425Vrms / 600Vdc
AEL-5019-425-112.5	18750W	37500W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	
AEL-5023-425-112.5	22500W	45000W (x2)*	112.5 Arms / 337.5Apeak	225Arms/337.5Apeak (x2)*	
AEL-5003-480-18.75	2800W	5600W (x2)*	18.75 Arms / 56.25Apeak	37.5Arms/56.25Apeak (x2)*	50~480Vrms / 700Vdc
AEL-5004-480-28	3750 W	7500W (x2)*	28 Arms / 84Apeak	56Arms/84Apeak (x2)*	

\* Turbo ON 功率與電流提升的倍率

## 特 性

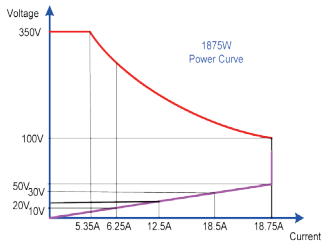
- 四個電錶可同時顯示電壓值( $V_{rms}$ ,  $V_{peak}$ ,  $V_{max.}$ ,  $V_{min.}$ )、電流值( $I_{rms}$ ,  $I_{peak}$ ,  $I_{max.}$ ,  $I_{min.}$ )、瓦特值、伏安值(VA)、頻率值、峰值因素、功率因素、電壓失真度( $V_{THD}$ ,  $V_H$ )、電流失真度( $I_{THD}$ ,  $I_H$ )等。
- 交/直流負載具定電流、線性定電流、定電阻、定電壓、定功率及整流性負載等工作模式。
- 峰值因素範圍：1.414~5.0。
- 功率因素範圍：0~1 超前或落後。
- 內建測試模式包括 UPS Efficiency, PV Inverter efficiency, UPS Back-up time, Battery discharge time, UPS transfer time, Fuse/Breaker trip/Non-trip, 短路模擬, OCP, OPP 等測試模式。
- Turbo mode(倍增模式)，能夠在短時間內承受多達2倍電流與功率的電子負載，最適合 Fuse/Breaker 及交流電源的短路、OCP、OPP測試。
- 時間量測可應用於電池、UPS、保險絲和斷路器等測試。
- 支援帶載開機；先設定 Load ON 便可支持帶載開機，逆變器或不斷電電源開機時便直接帶著所設定負載電流開機，用來驗證 Inverter 連接電器時啟動是否穩定。
- 支援拉載與卸載角度控制；拉載卸載角度控制，0-359度全範圍都可設定，用來驗證實際電器插拔時，Inverter 輸出電壓暫態反應是否穩定，Overshoot/Undershoot 是否在容許範圍內。
- 支援正半週或負半週拉載；用來驗證實際電器只有正半周或負半周負載電流時，Inverter 輸出電壓是否維持穩定。
- 支援 SCR/TRIAC 的電流調變波形，90度 Trailing Edge 及 Leading Edge。
- 支援電源供應器於開機時之電容性負載(Inrush Current)與運行中負載突然接入(Hot Plug-in)時的瞬間電流(Surge Current)測試。
- 頻率範圍：DC, 40~440Hz
- 電壓，電流監控。
- 外部電壓控制定電流、線性定電流、定電阻、定電壓、定功率等工作模式。
- 過電壓警示、過電流、過功率、過溫度保護。
- GPIB、RS-232、USB、LAN(選配)控制介面。
- 最齊全的量測功能

AEL-5000系列交/直流電子負載內建16位元A/D及DSP等精準的量測電路，提供了精確的量測值，量測項目共有電壓均方根值( $V_{rms}$ )、電流均方根值( $A_{rms}$ )、瓦特值(Watt)、伏安(VA)、波峰因素(CF)、功率因素(PF)、總諧波失真率(THD)、電壓總諧波失真率( $V_{THD}$ )、電流總諧波失真率( $I_{THD}$ )、峰值電流( $I_{peak}$ )、電流最大值( $A_{max}$ )、電流最小值( $A_{min}$ )、電壓最大值( $V_{max}$ )、電壓最小值( $V_{min}$ )。

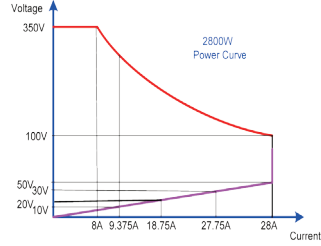
除了這些量測功能外，亦提供了時間量測，產品如 UPS、保險絲及斷路器等的跳脫或熔斷時間及 Off-line UPS 的轉換時間(Transfer time)。

# 交 / 直流 電子 負載

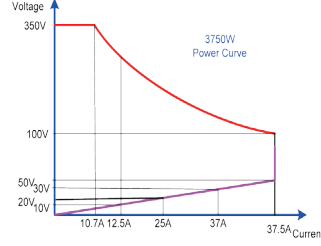
## 功率曲線



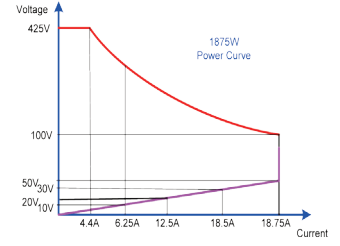
**AEL-5002-350-18.75**



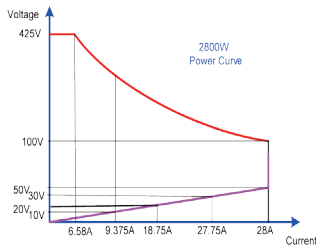
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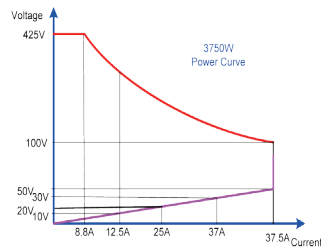
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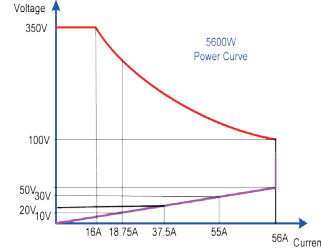
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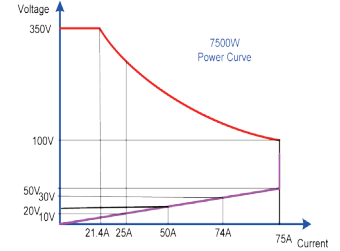
**AEL-5003-425-28**



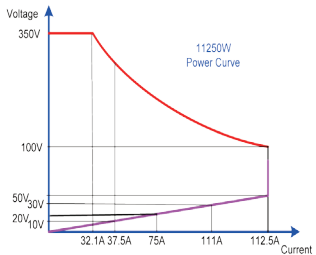
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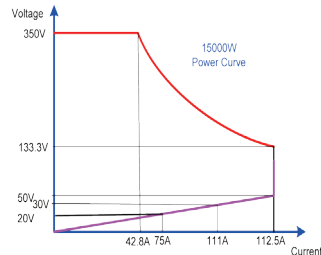
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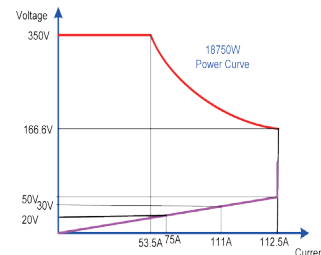
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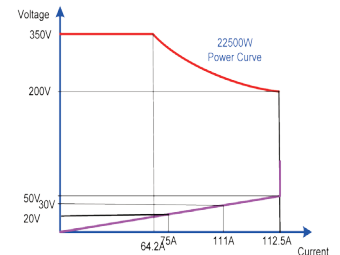
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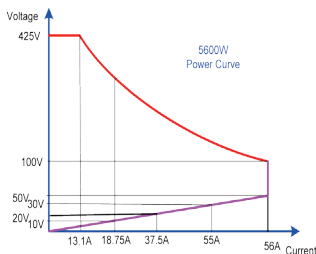
**AEL-5015-350-112.5**



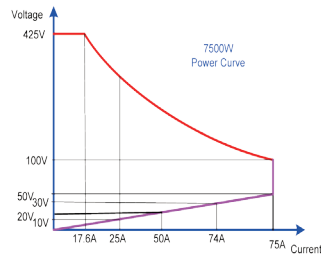
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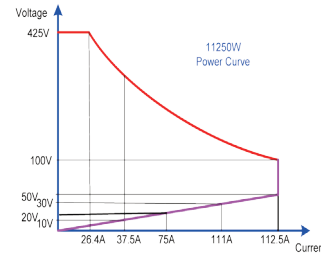
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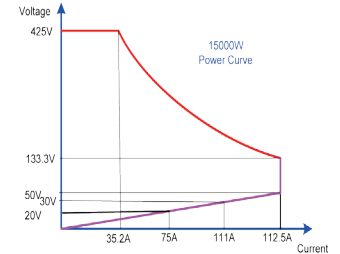
**AEL-5006-425-56**



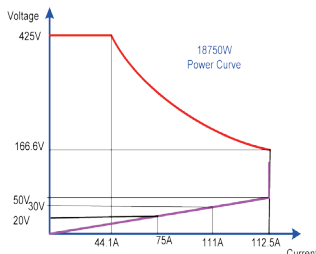
**AEL-5008-425-75**



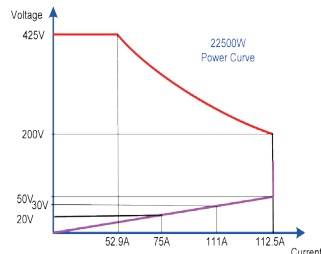
**AEL-5012-425-112.5**



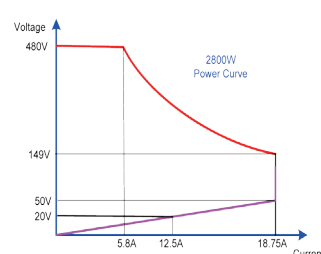
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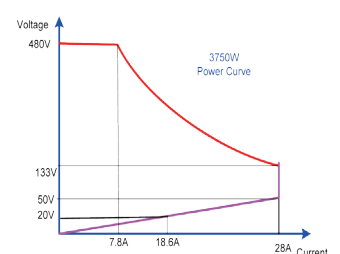
**AEL-5019-425-112.5**



**AEL-5023-425-112.5**



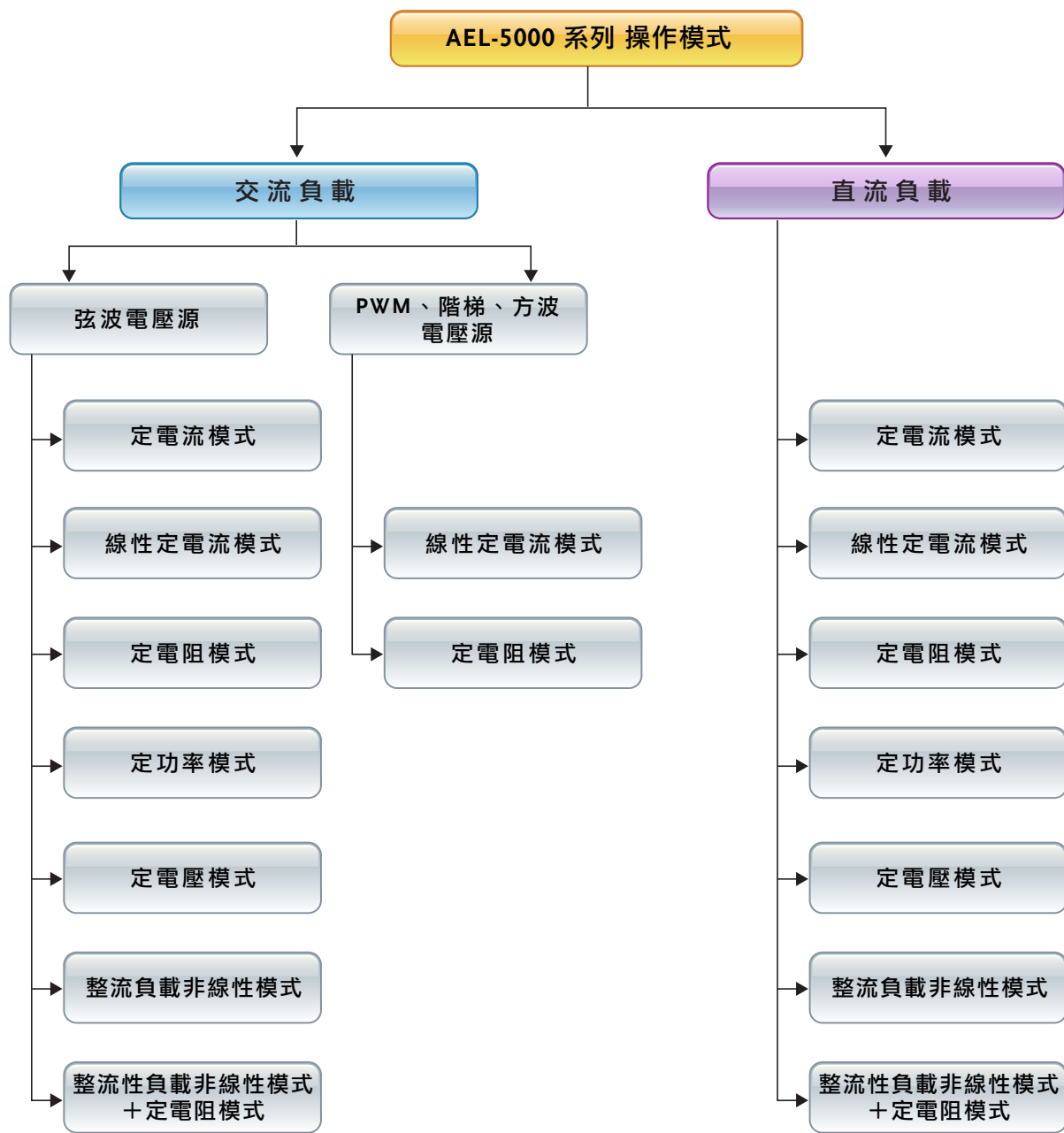
**AEL-5003-480-18.75**



**AEL-5004-480-28**

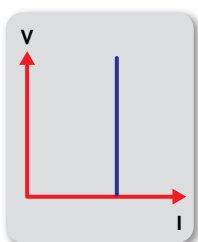
# 交 / 直流 電子 負載

完整的交流及直流負載模式

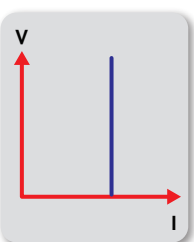


## 交流負載模式

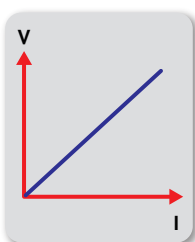
定電流模式



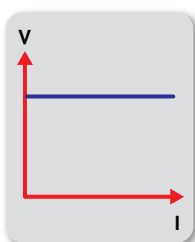
線性定電流模式



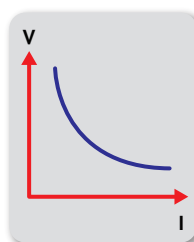
定電阻模式



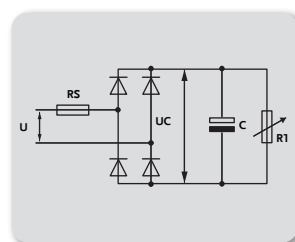
定電壓模式



定功率模式



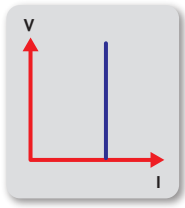
整流性負載模式



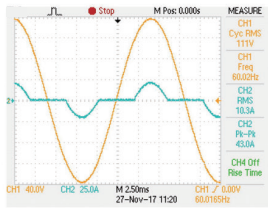
# 交 / 直流電子負載

## 交流負載模式

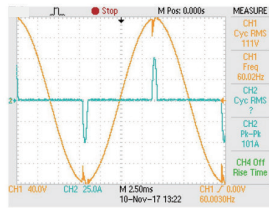
交流負載的定電流模式：僅適用於弦波電壓源，提供線性負載的CF，PF測試。



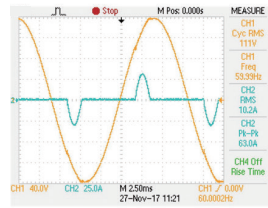
CC mode



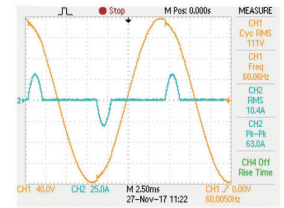
CC mode, CF = 2



CC mode, CF = 5

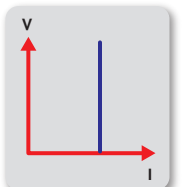


CC mode, CF = +0.5

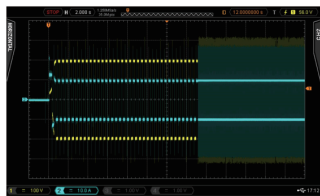


CC mode, CF = -0.5

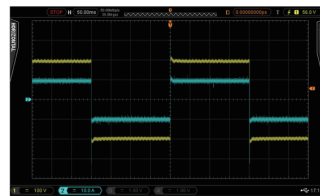
線性定電流模式：可以適用於弦波與非弦波電壓源，如下圖所示的 PWM 變頻驅動器，階梯(Step)電壓源，及 UPS 弦波變方波，方波變弦波。



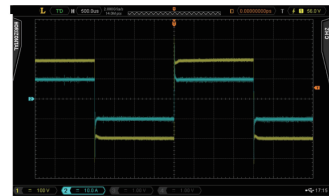
Linear CC mode



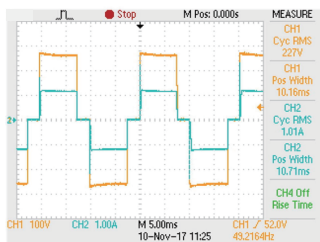
Linear CC mode, PWM 10A 2.5Hz to 250Hz



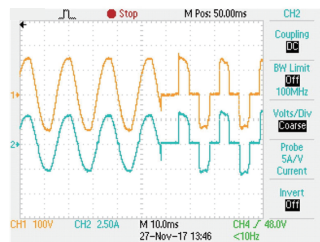
Linear CC mode, PWM 10A 2.5Hz



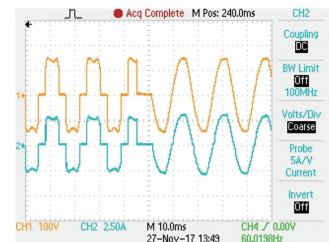
Linear CC mode, PWM 10A 250Hz



Linear CC mode, Step 10A

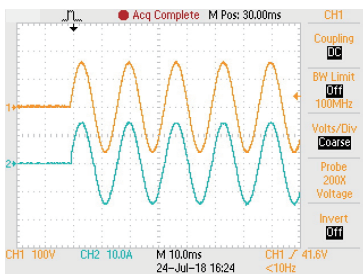


Linear CC mode, UPS Sine to Square Waveform

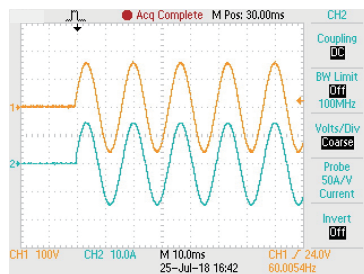


Linear CC mode, UPS Sine to Square Waveform

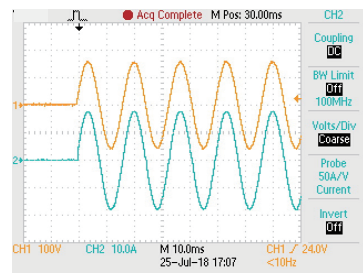
支援帶載開機：模擬待測物直接插入(Plug-in)拉載；先設定 Load ON 便可支持帶載開機，逆變器或不斷電源開機時便直接帶著所設定負載電流開機，用來驗證 Inverter 連接電器時啟動是否穩定。



CC 10A 帶載開機



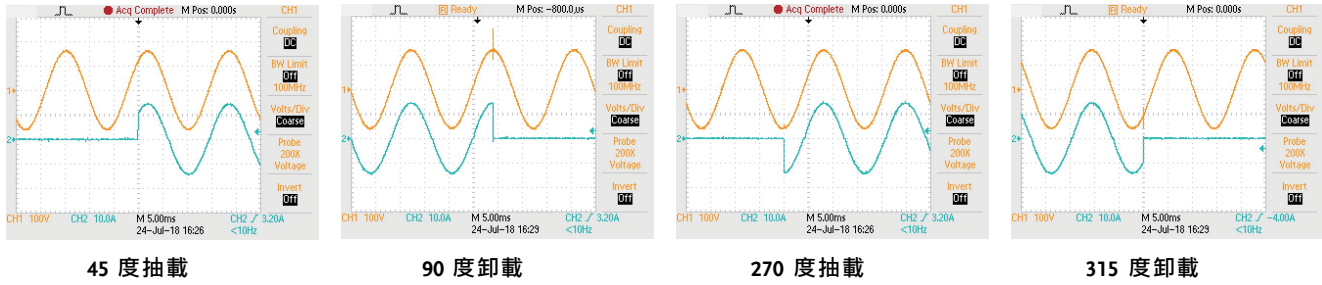
CR 10A 帶載開機



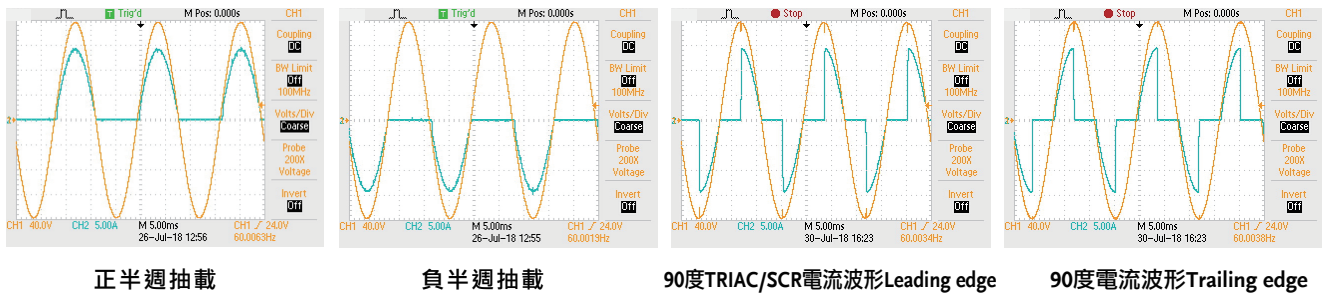
CV 10A 帶載開機

# 交 / 直流 電子 負 載

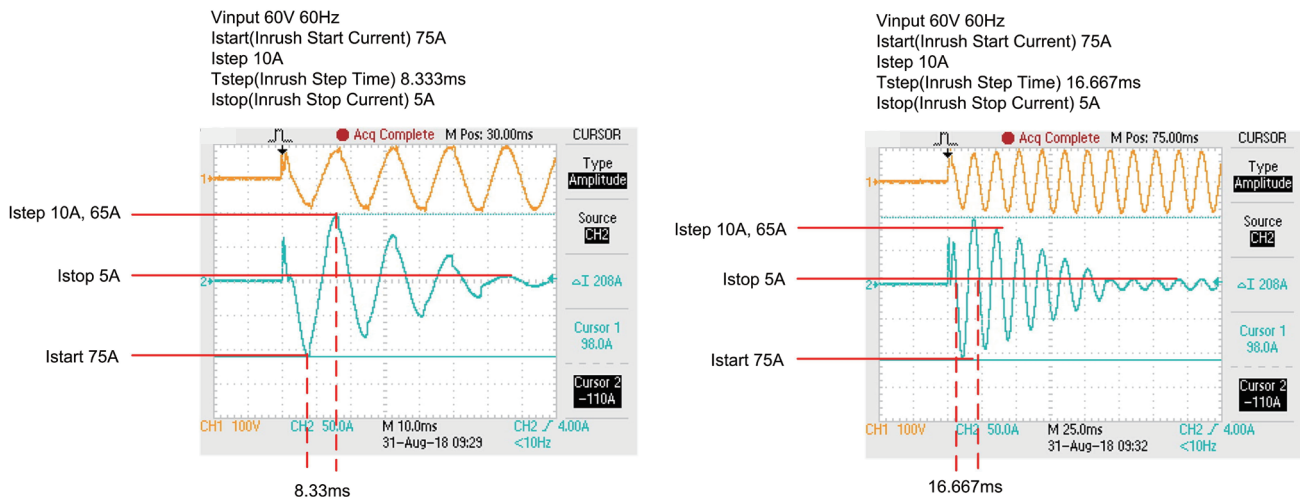
支援拉載與卸載角度控制：拉載卸載角度控制，0-359度全範圍都可設定，用來驗證實際電器插拔時，Inverter輸出電壓暫態反應是否穩定，Overshoot / Undershoot 是否在容許範圍內。



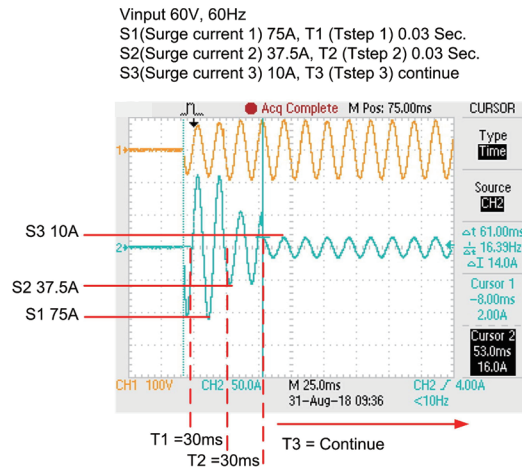
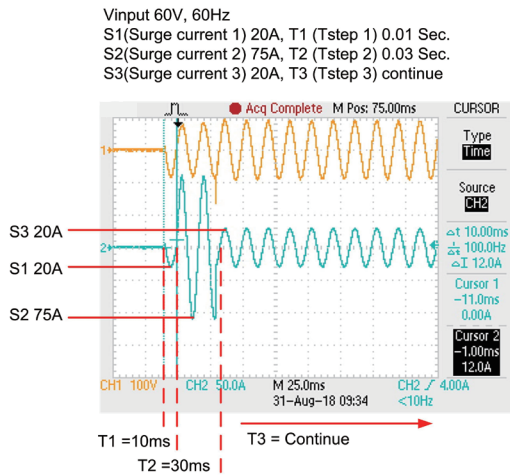
支援正半週與負半週拉載及SCR/TRIAC的電流調變波形，90度Trailing edge及Leading Edge；用來驗證實際電器只有正半週或負半週及 SCR/TRIAC負載電流時，Inverter輸出電壓是否維持穩定。



支援電源供應器於開機時之電容性負載(Inrush Current)與運行中負載突然接入(Hot Plug-in)測試 用來驗證電器在開機時的瞬間啟動電流(Inrush Current)及電器突然接上(Surge Current)時，Inverter輸出電壓暫態反應是否穩定，如下圖所示。



開機時的瞬間啟動電流 (Inrush Current) 測試

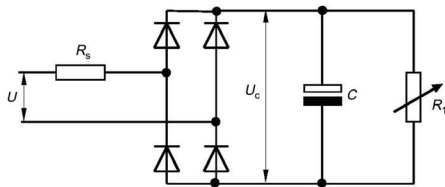


電器突然接上時的瞬間突波電流(Surge Current)測試

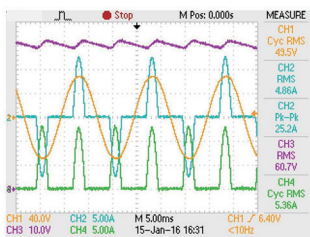
## 交流整流負載模擬符合 IEC62040-3 and IEC61683 測試規範

AEL-5000系列 AC/DC 電子負載的交流整流模式，完全符合 IEC 對 UPS及 PV Inverter 的測試規範要求，分別是 IEC62040-3 UPS Efficiency Measurement non-Linear and IEC61683 Resistive Plus Non-Linear。  
 AEL-5000系列的交流整流性負載模式，是使用CC+CR負載模式並維持電流的THD在80%，來模擬實際PV Inverter所連接的電子設備。

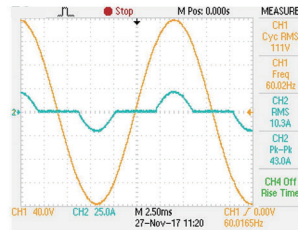
整流性負測試



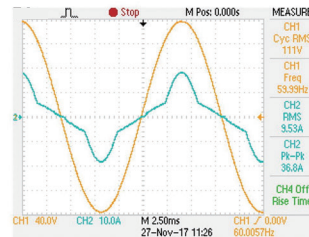
IEC 508/99



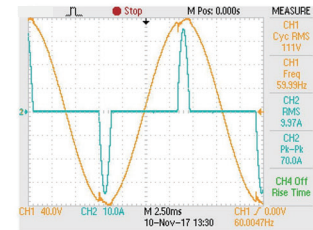
實際的V/A波形



UPS測試的Non-Linear CC mode



110V, 5A + 22ohm Test Waveform 110V, 10A+11ohm Test Waveform  
 PV Inverter 測試的 Non-Linear CC+Resistive mode(CC+CR)

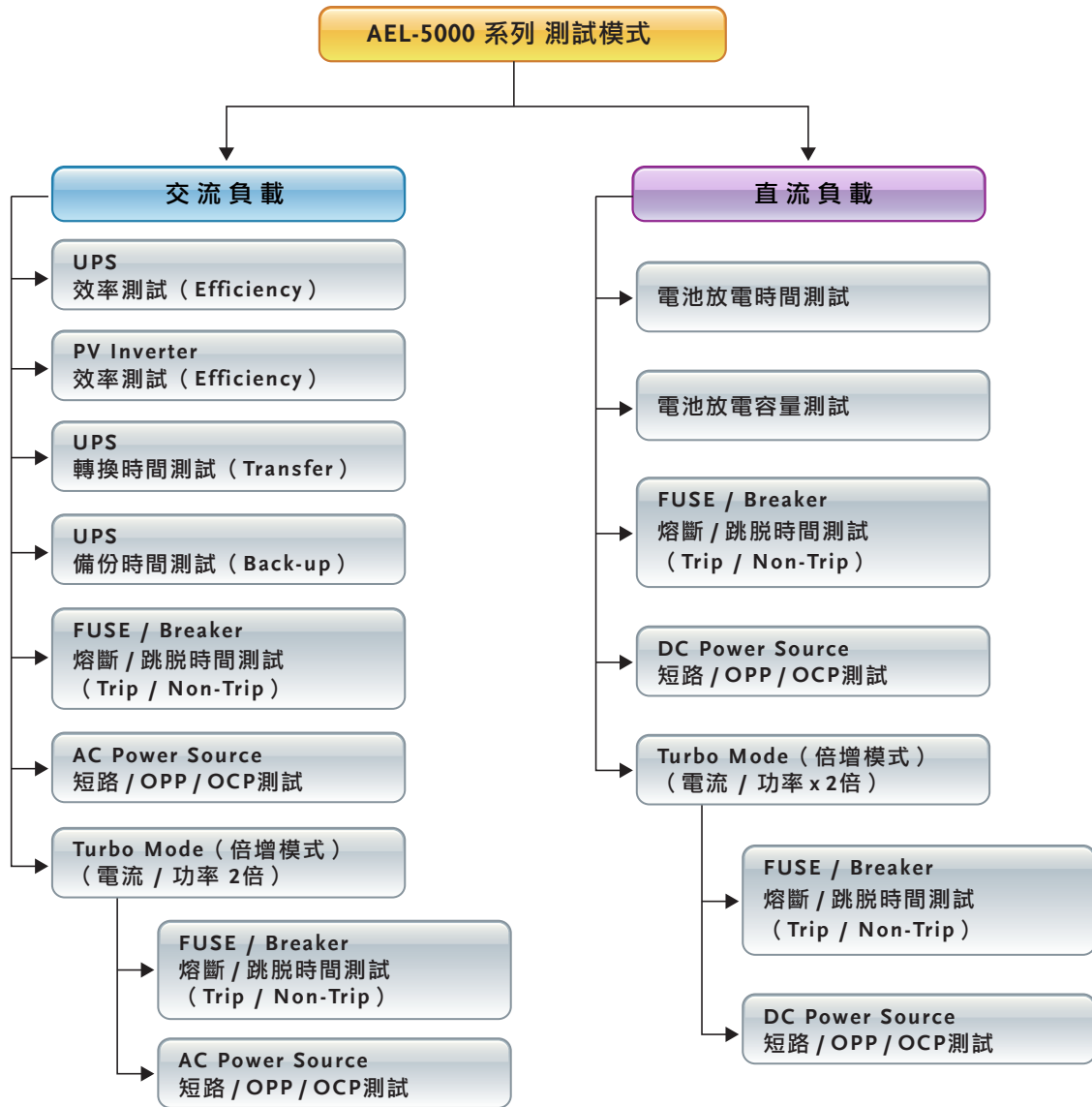




# 交 / 直流 電子 負載

## AEL-5000 負載的各種測試模式

AEL-5000系列AC/DC 電子負載特別內建各種產品所需的測試模式，包括交流部分的UPS, Inverter, Fuse/Breaker, AC Power Source，及直流部份的 Battery, Fuse/Breaker, DC Power Source等，如下圖所示。



# 交 / 直流 電子 負 載

## 電 流 保 護 元 件 測 試

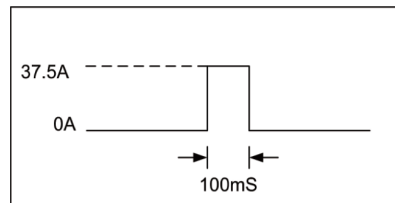
電 流 保 護 元 件 包 括 Fuse 保 險 絲， Breaker 斷 路 器 及 新 型 的 PTC Resettable fuse 自 恢 復 保 險 絲 等， 其 作 用 是 當 電 路 電 流 超 過 設 計 的 額 定 值 時， 也 就 是 負 荷 超 過 設 計 的 電 流 容 量 時 便 將 電 路 斷 開。 以 避 免 發 生 過 熱、 甚 至 著 火， 起 火 等 危 險。 上 述 保 護 元 件 中 Fuse 是 一 次 性 使 用， Breaker 與 PTC 就 可 以 重 覆 使 用。

電 流 保 護 元 件 的 保 護 電 流 值 與 保 護 反 應 時 間 通 常 是 具 有 乘 積 的 關 係， 也 就 是 通 過 電 流 保 護 元 件 的 電 流 愈 大， 則 其 保 護 斷 路 的 反 應 時 間 就 愈 短， 這 就 類 似 是 能 量 保 護 元 件。

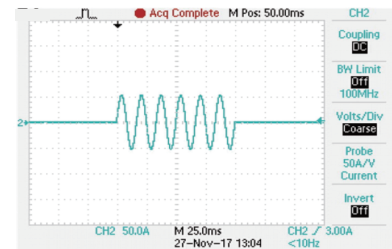
針 對 這 樣 的 特 性， AEL-5000 系 列 交 直 流 電 子 負 載 特 別 針 對 電 流 保 護 元 件 的 測 試 驗 證 開 發 出 Fuse Test 功 能， 就 能 夠 用 一 額 定 電 流 與 功 率 的 電 子 負 載 來 測 試 驗 證 此 類 保 護 元 件。 當 Turbo mode(倍 增 模 式) 設 置 為 ON 時， 在 1 秒 的 測 試 時 間 內， 測 試 電 流 可 以 倍 增 到 最 大 電 流 的 2 倍， 以 AEL-5000 為 例， 最 大 測 試 電 流 可 倍 增 為 75A， 也 就 是 使 用 AEL-5000 系 列 的 Turbo mode 為 ON 時， 於 1 秒 測 試 時 間 內 就 可 以 達 到 2 台 AEL-5000 系 列 的 測 試 電 流 值。



Turbo OFF, Short 100ms 37.5A 測試結果畫面



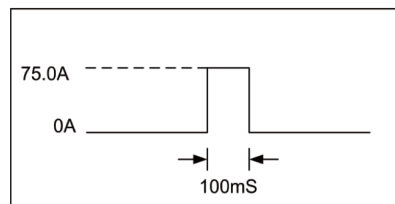
Turbo OFF, Short 100ms 37.5A 設定



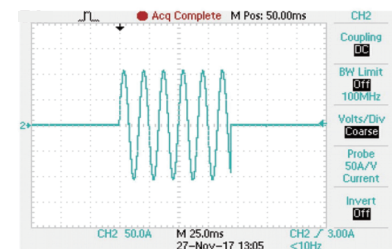
Turbo OFF, Short 100ms 37.5A  
實際測試波形



Turbo ON, Short 100ms 75.0A 測試結果畫面



Turbo ON, Short 100ms 75.0A 設定

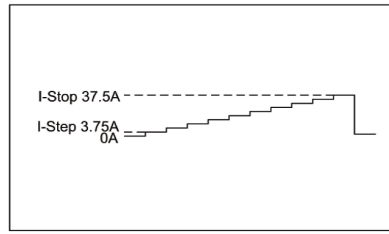


Turbo ON, Short 100ms 75.0A  
實際測試波形

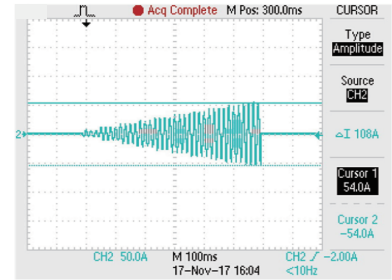
# 交 / 直流電子負載



Turbo OFF, OCP Istep 3.75 A Istop 37.5A  
測試結果畫面



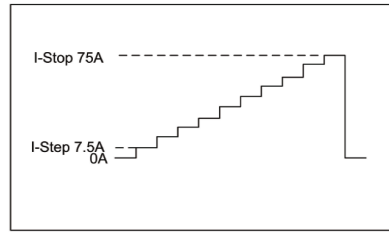
Turbo OFF, OCP Istep 3.75 A Istop 37.5A  
設定



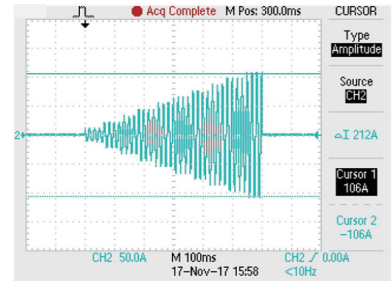
Turbo OFF, OCP Istep 3.75 A Istop 37.5A  
實際測試波形



Turbo ON, OCP Istep 7.5 A Istop 75A  
測試結果畫面



Turbo ON, OCP Istep 7.5 A Istop 75.0A  
設定



Turbo ON, OCP Istep 7.5 A Istop 75.0A  
實際測試波形

Fuse Test基本上分為Trip（熔斷）與Non-Trip（沒有熔斷）2種。

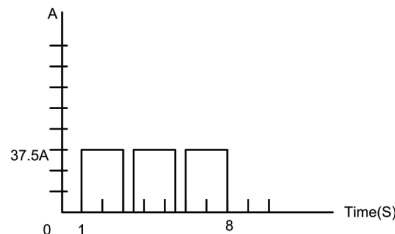
Fuse Test設定參來包括測試電流（Istart），測試時間（Time），測試重覆次數REPEAT TIME等。

在Trip熔斷測試下，是用來測試電流過大異常發生時必須能夠提供斷路的保護能力，表示電流保護元件需熔斷的動作，因此測試電流需要大於熔斷的電流規格，當AEL-5000系列電子負載偵測到電壓低於1.0V，LCD就顯示Repeat次數及電流保護元件的熔斷時間 XXXX.X sec。

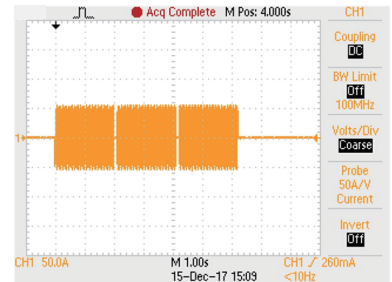
在Non-Trip測試下，表示電流保護元件需達到不熔斷的動作，因此測試電流需要低於熔斷的電流規格，用來驗證在正常電流範圍內就必須不熔斷，當AEL-5000系列電子負載在測試時間（Pulse Time）與重覆Repeat次數結束後都沒熔斷，LCD顯示Repeat次數的資訊。



Turbo : OFF, Fuse mode 測試結果畫面



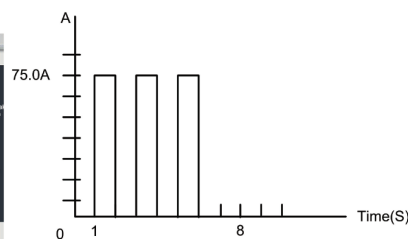
設定 : Turbo : OFF, Fuse ON,  
CC pulse 37.5A, 2s, 測試3次



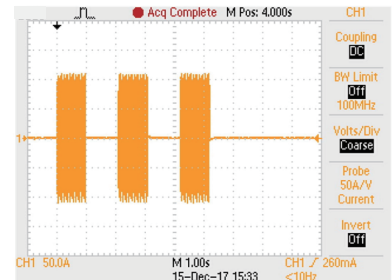
Turbo : OFF, Fuse ON,  
CC pulse 37.5A, 2s, 測試3次實際測試波形



Turbo : ON, Fuse mode 測試結果畫面



設定 : Turbo : ON, Fuse ON,  
CC pulse 75.0A, 1s, 測試3次

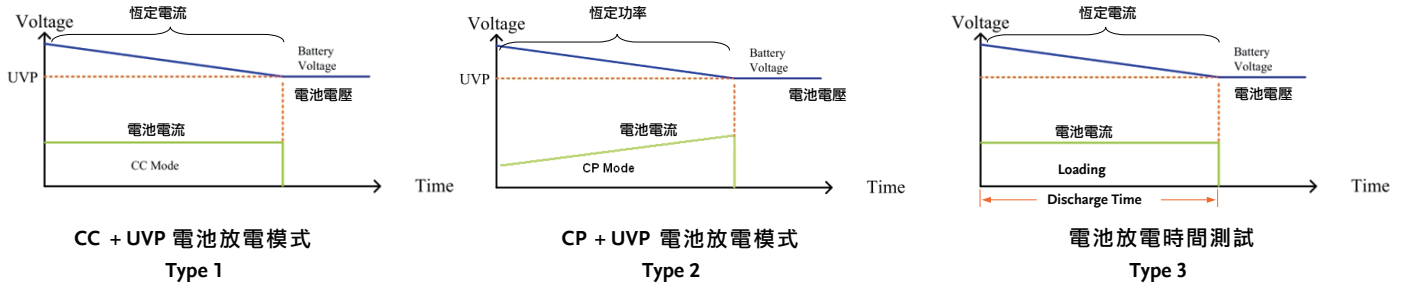


Turbo : ON, Fuse ON,  
CC pulse 75A, 1s, 測試3次實際測試波形

# 交 / 直流 電子 負載

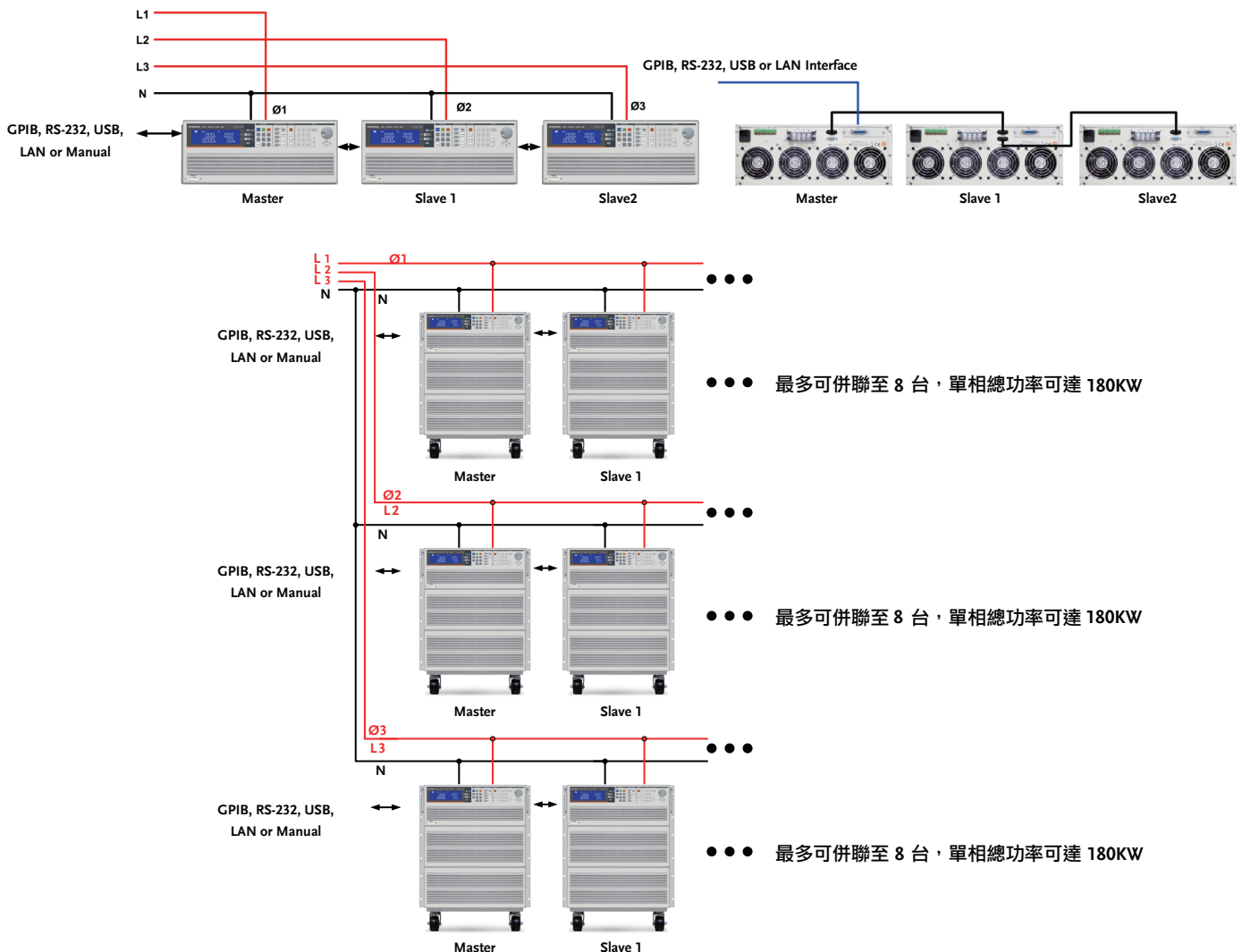
## 電池 測試 功能

AEL-5000系列負載新增TYPE1~TYPE3共二種電池放電測試，可以依需要選擇適當的電池測試模式，測試結果可以直接在LCD顯示器上顯示電池的AH容量、放電後的電壓值、放電的累計時間等數據。



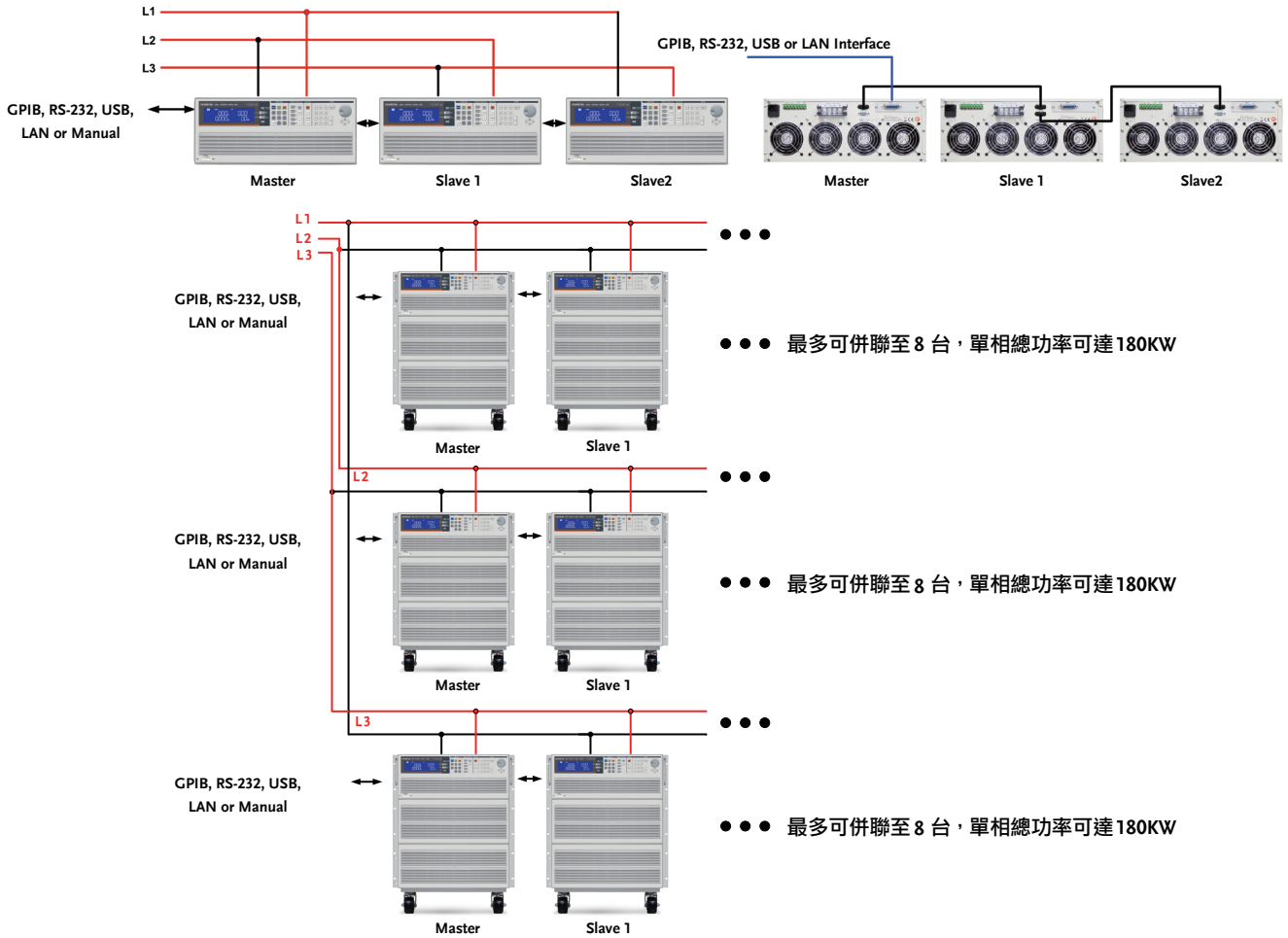
## 並聯 及 三相 控制

AEL-5000系列負載提供多台並聯、三相應用功能，讓使用者能夠進行更大功率或三相交流電源的測試應用，這樣可以更靈活、更彈性的使用AEL-5000系列交流電子負載，以節省成本。在並聯/三相的操作上，使用者如同操作單機一樣，只要對 Master進行操作即可，Slave1 及 Slave2 會自動進行該相的吃載及量測。並聯及三相的連接如下圖所示。

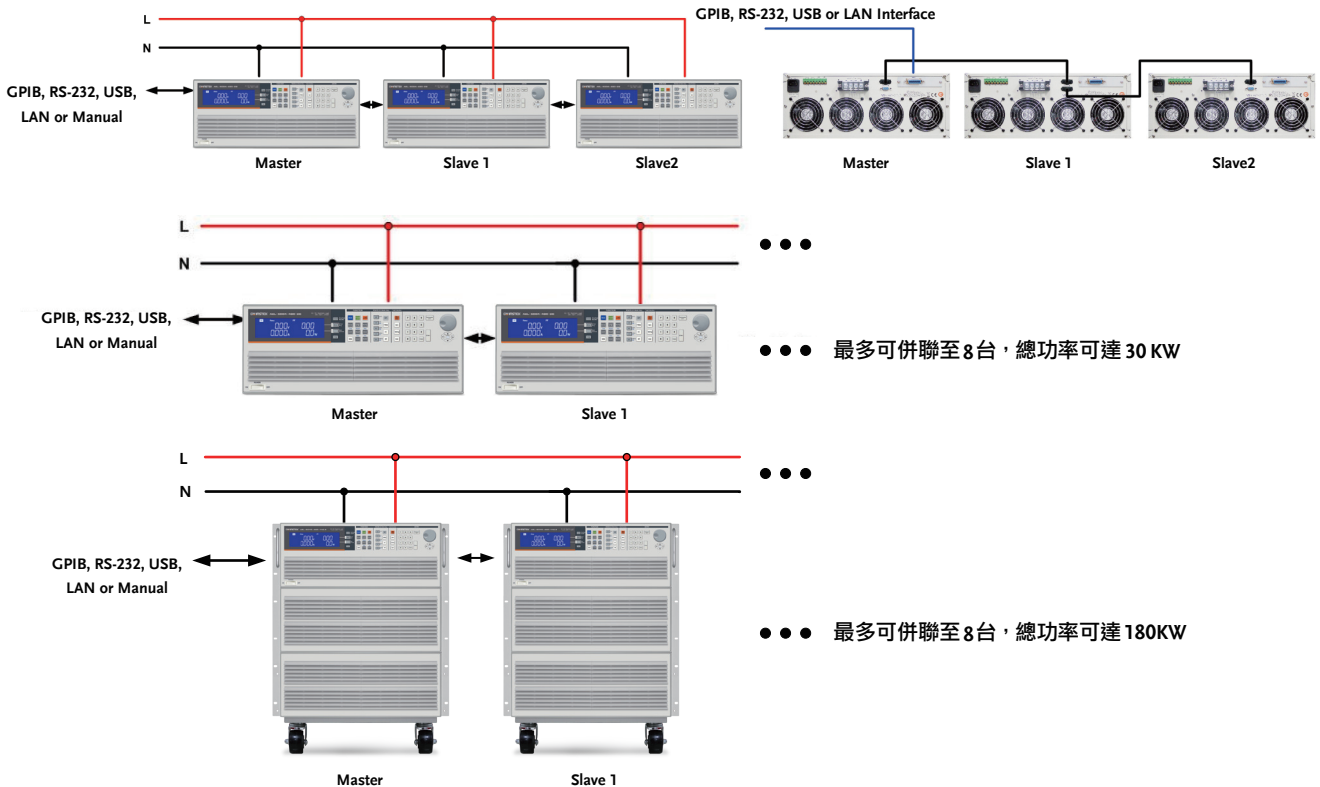


最大單相功率可達 180kW，3 相總功率達 540kW 之 3 相 Y 連接

# 交 / 直流電子負載



最大單相功率可達 180kW，3 相總功率達 540kW 之 3 相  $\Delta$  連接



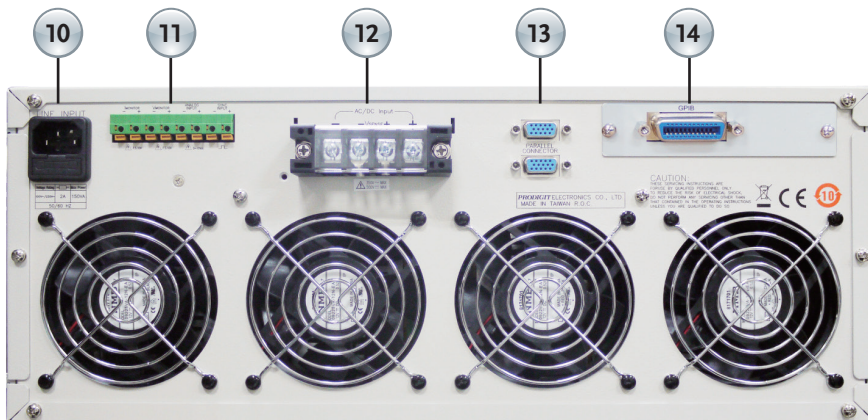
並聯連接

# 交 / 直流電子負載

## 面板說明



1	LCD 多功能顯示器 四個電錶可同時顯示電壓值 (Vrms, Vpeak, Vmax., Vmin)、電流值 (Irms, Ipeak, Imax., Imin.)、瓦特值、伏安值(VA)、頻率值、峰值因素、功率因素、電壓諧波失真度(VTHD, VH)、電流諧波失真度(ITHD, IH)等。	4	波形庫按鍵 可快速設定 CF $\sqrt{2}$ / 2 / 2.5 / 3 / 3.5, +/- PF0.6 / 0.7 / 0.8 / 0.9 / 1.0, FREQ Auto / 50Hz / 60Hz / 400Hz。
2	電錶切換鍵 V/A/W 鍵可設定顯示 Rms/Peak/Max/Min, Meter 鍵可選擇 PF/CF/FREQ, 可切換顯示 WATT/VA/VAR 鍵, THD 鍵選擇顯示 THD	5	測試功能鍵 可選擇 Short / OPP / OCP / Non-L / NL-CR / Fuse / Batt (Battery Discharge) / Trans (UPTransfer time) 等測試功能。
3	操作功能鍵 Mode, Preset ON/OFF, Load ON/OFF, Sense ON/OFF, Level A/B, Config, Limit, Recall, Store, SEQ, Local, System 等操作功能鍵。	6	數字按鍵區
		7	設定旋鈕
		8	電源開關
		9	游標與設定按鍵



10	交流電源輸入連接器	13	主從控制連接器 Master: 上端或下端連接至下一台 Slave: 上端連接至前一台, 下端連接至下一台
11	Vmonitor、Imonitor、Analog input、SYNC input 輸入端子		
12	Vload, Vsense 輸入端子	14	通訊界面 (GPIB、RS-232、USB、LAN)

# 交 / 直 流 電 子 負 載

## 規 格

MODEL	AEL-5002-350-18.75	AEL-5003-350-28	AEL-5004-350-37.5	AEL-5002-425-18.75	AEL-5003-425-28	AEL-5004-425-37.5	
Power (W)	1875 W	2800W	3750 W	1875 W	2800W	3750 W	
Current(Ampere)	18.75 Arms / 56.25Apeak	28 Arms / 84Apeak	37.5 Arms / 112.5Apeak	18.75 Arms / 56.25Apeak	28 Arms / 84Apeak	37.5 Arms / 112.5Apeak	
Voltage(Volt)	50-350Vrms / 500Vdc			50-425Vrms / 600Vdc			
FREQUENCY Range	DC,40-440Hz(CC,CP Mode), DC-440Hz(LIN,CR,CV Mode)			DC,40-440Hz(CC,CP Mode), DC-440Hz(LIN,CR,CV Mode)			
<b>PROTECTIONS</b>							
Over Power Protection	≅ 1968.75Wrms or Programmable	≅ 2940Wrms or Programmable	≅ 3937.5Wrms or Programmable	≅ 1968.75Wrms or Programmable	≅ 2940Wrms or Programmable	≅ 3937.5Wrms or Programmable	
Over Current Protection	≅ 19.687 Arms or Programmable	≅ 29.4 Arms or Programmable	≅ 39.375 Arms, or Programmable	≅ 19.687 Arms or Programmable	≅ 29.4 Arms or Programmable	≅ 39.375 Arms, or Programmable	
Over Voltage Protection	≅ 367.5 Vrms / 525Vdc			≅ 446.25 Vrms/630Vdc			
Over Temp. Protection	Yes			Yes			
<b>OPERATION MODE</b>							
<b>Constant Current Mode for Sine-Wave</b>							
Range	0-18.75A	0-28A	0-37.5A	0-18.75A	0-28A	0-37.5A	
Resolution	0.3125mA/16bits	0.5mA/16bits	0.625mA/16bits	0.3125mA/16bits	0.5mA/16bits	0.625mA/16bits	
Accuracy	± ( 0.1% of setting + 0.2% of range ) @ 50/60Hz, ± 0.5% of ( setting + range ) @ DC and 400Hz			± ( 0.1% of setting + 0.2% of range ) @ 50/60Hz, ± 0.5% of ( setting + range ) @ DC and 400Hz			
<b>Linear Constant Current Mode for Sine-Wave, Square-Wave or Quasi-Square Wave, PWM Wave</b>							
Range	0-18.75A	0-28A	0-37.5A	0-18.75A	0-28A	0-37.5A	
Resolution	0.3125mA/16bits	0.5mA/16bits	0.625mA/16bits	0.3125mA/16bits	0.5mA/16bits	0.625mA/16bits	
Accuracy	± ( 0.1% of setting + 0.2% of range ) @ 50/60Hz, ± 0.5% of ( setting + range ) @ DC and 400Hz			± ( 0.1% of setting + 0.2% of range ) @ 50/60Hz, ± 0.5% of ( setting + range ) @ DC and 400Hz			
<b>Constant Resistance Mode</b>							
Range	3.2 ohm ~ 64k ohm	2.0 ohm ~ 40k ohm	1.6 ohm ~ 32k ohm	3.2 ohm ~ 64k ohm	2.0 ohm ~ 40k ohm	1.6 ohm ~ 32k ohm	
Resolution*1	0.0053081ms/16bits	0.003333ms/16bits	0.010416ms/16bits	0.0053081ms/16bits	0.003333ms/16bits	0.010416ms/16bits	
Accuracy	±0.2% of ( setting + range ) @ 50/60Hz, ± 1.0% of setting + 2% of range @ DC and 400Hz			±0.2% of ( setting + range ) @ 50/60Hz, ± 1.0% of setting + 2% of range @ DC and 400Hz			
<b>Constant Voltage Mode</b>							
Range	50-350Vrms / 500Vdc			50-425Vrms / 600Vdc			
Resolution	0.01V			0.1V			
Accuracy	±(0.1% of setting + 0.1% of range)			±(0.1% of setting + 0.1% of range)			
<b>Constant Power Mode</b>							
Range	1875W	2800W	3750W	1875W	2800W	3750W	
Resolution	0.1W	0.1W	0.1W	0.1W	0.1W	0.1W	
Accuracy*4	±0.5% of ( setting + range ) @ 50/60Hz, ±2% of ( setting + range )			±0.5% of ( setting + range ) @ 50/60Hz, ±2% of ( setting + range )			
<b>CREST FACTOR (CC &amp; CP MODE ONLY)</b>							
Range	-2~5			-2~5			
Resolution	0.1			0.1			
Accuracy	(0.5% / Irms) + 1% F.S.			(0.5% / Irms) + 1% F.S.			
<b>POWER FACTOR (CC &amp; CP MODE ONLY)</b>							
Range	0-1 Lag or Lead			0-1 Lag or Lead			
Resolution	0.01			0.01			
Accuracy	1% F.S.			1% F.S.			
<b>TEST MODE</b>							
<b>UPS Efficient Measurement</b>							
Operating Frequency	Non-Linear Mode Auto: 40-440Hz			Non-Linear Mode Auto: 40-440Hz			
Current Range	0-18.75A	0-28A	0-37.5A	0-18.75A	0-28A	0-37.5A	
PF Range	0-1			0-1			
<b>Measuring Efficiency For PV Systems, Power Conditioners for THD 80%</b>							
Operating Frequency	Auto: 40-440Hz			Auto: 40-440Hz			
Current Range	0-18.75A	0-28A	0-37.5A	0-18.75A	0-28A	0-37.5A	
Resistive Range	3.2 ohm ~ 64k ohm	2.0 ohm ~ 40k ohm	1.6 ohm ~ 32k ohm	3.2 ohm ~ 64k ohm	2.0 ohm ~ 40k ohm	1.6 ohm ~ 32k ohm	
<b>UPS Back-Up Function(CC,LIN,CR,CP)</b>							
UPS Back-Up Time	50-350Vrms / 500Vdc 1-99999 Sec. (-27H)			50-425Vrms / 600Vdc 1-99999 Sec. (-27H)			
<b>Battery Discharge Function(CC,LIN,CR,CP)</b>							
UPS Back-Up Time	50-350Vrms / 500Vdc 1-99999 Sec. (-27H)			50-425Vrms / 600Vdc 1-99999 Sec. (-27H)			
<b>UPS Transfer Time</b>							
Current Range	0-18.75A	0-28A	0-37.5A	0-18.75A	0-28A	0-37.5A	
Voltage (VTH)	2.5V			2.5V			
Time Range							
<b>Fuse Test Mode</b>							
Max. Current	Turbo OFF(CC1-3)	18.75Arms	28.0Arms	37.5Arms	18.75Arms	28.0Arms	37.5Arms
	Turbo ON(CC3)						
	Turbo ON(CC1-2)	37.5Arms (x2) *3	56.0Arms (x2) *3	75.0Arms (x2) *3	37.5Arms (x2) *3	56.0Arms (x2) *3	75.0Arms (x2) *3
Trip & Non-Trip Time	Turbo OFF(Time1-3)		0.01-333.33 Sec.		0.01-333.33 Sec.		
	Turbo ON(Time1-2)		0.01-0.5 Sec.		0.01-0.5 Sec.		
	Turbo ON(Time3)		0.01-600.00 Sec.		0.01-600.00 Sec.		
OFF Time		0.1-999.9 Sec.		0.1-999.9 Sec.			
Meas. Accuracy		±0.003 Sec.		±0.003 Sec.			
Repeat Cycle		0-99999		0-99999			
<b>Short/OPP/OCF Test Function</b>							
Short Time	Turbo OFF	0.1-10Sec. or Cont.			0.1-10Sec. or Cont.		
	Turbo ON	0.1-1Sec.			0.1-1Sec.		
	Turbo OFF	100ms			100ms		
OPP/OCF Step Time	Turbo ON	100ms, up to 10 Steps			100ms, up to 10 Steps		
	Turbo OFF	18.75Arms	28.0Arms	37.5Arms	18.75Arms	28.0Arms	37.5Arms
	Turbo ON	37.5Arms	56.0Arms	75.0Arms	37.5Arms	56.0Arms	75.0Arms
OCF Istop	Turbo OFF	18.75Arms	28.0Arms	37.5Arms	18.75Arms	28.0Arms	37.5Arms
	Turbo ON	37.5Arms	56.0Arms	75.0Arms	37.5Arms	56.0Arms	75.0Arms
	Turbo OFF	1875W	2800W	3750W	1875W	2800W	3750W
OPP Pstop	Turbo ON	3750W	5600W	7500W	3750W	5600W	7500W
	Turbo OFF						
	Turbo ON						
<b>Programmable Inrush Current Simulation: Istart - Istop / Tsep</b>							
Istart, Inrush Start Current	0-37.5A	0-56A	0-75A	0-37.5A	0-56A	0-75A	
Inrush Step Time		0.1ms-100ms			0.1ms-100ms		
Istop, Inrush Stop Current	0-18.75A	0-28A	0-37.5A	0-18.75A	0-28A	0-37.5A	
<b>Programmable Surge Current Simulation: S1/T1 - S2/T2 - S3/T3</b>							
S1 and S2 Current	0-37.5A	0-56A	0-75A	0-37.5A	0-56A	0-75A	
T1 and T2 Time		0.01-0.5Sec			0.01-0.5Sec.		
S3 Current	0-18.75A	0-28A	0-37.5A	0-18.75A	0-28A	0-37.5A	
T3 Time		0.01-9.99Sec. or Cont.			0.01-9.99Sec. or Cont.		
<b>MEASUREMENTS</b>							
<b>VOLTAGE READBACK V METER</b>							
Range	500V			600V			
Resolution	0.01V			0.01V			
Accuracy	±0.05% of (reading + range)			±0.05% of (reading + range)			
Parameter	Vrms, V Max/Min, +/-Vpk			Vrms, V Max/Min, +/-Vpk			
<b>CURRENT READBACK A METER</b>							
Range	9.375Arms/18.75Arms	14Arms/28Arms	18.75Arms/37.5Arms	9.375Arms/18.75Arms	14Arms/28Arms	18.75Arms/37.5Arms	
Resolution	0.2mA/0.4mA	0.3mA/0.6mA	0.4mA/0.8mA	0.2mA/0.4mA	0.3mA/0.6mA	0.4mA/0.8mA	
Accuracy	±0.05% of ( reading + range ) @ 50/60Hz			±0.05% of ( reading + range ) @ 50/60Hz			
Parameter	Irms, I Max/Min, +/-Ipk			Irms, I Max/Min, +/-Ipk			
<b>WATT READBACK W METER</b>							
Range	1875W	2800W	3750W	1875W	2800W	3750W	
Resolution	0.03125W	0.05W	0.0625W	0.03125W	0.05W	0.0625W	
Accuracy*4	±0.5% of ( reading + range ) @ 50/60Hz, ±2% of ( reading + range )			±0.5% of ( reading + range ) @ 50/60Hz, ±2% of ( reading + range )			
<b>VA METER</b>							
Parameter	Vrms x Arms Correspond To Vrms and Arms			Vrms x Arms Correspond To Vrms and Arms			
<b>POWER FACTOR METER</b>							
Range	+/- 0.000-1.000			+/- 0.000-1.000			
Accuracy	±(0.002±(0.001)/(PF)*F)			±(0.002±(0.001)/(PF)*F)			
<b>FREQUENCY METER(Hz)</b>							
Range	DC,40-440Hz			DC,40-440Hz			
Accuracy	0.1%			0.1%			
<b>Other Parameter METER</b>							
Parameter	VA, VAR, CF, I, Ipeak, Imax, Imin, Vmax, Vmin, IHD, VHD, ITHD, VTHD						
<b>OTHERS</b>							
Start up Loading	Yes, Power on loading during Inverter / UPS start up			Yes, Power on loading during Inverter / UPS start up			
Load ON / OFF Angle	0 - 359 degree can be programmed for the angle of load ON and load OFF loading			0 - 359 degree can be programmed for the angle of load ON and load OFF loading			
Half Cycle and SCR/TRIAC Loading	Positive or Negative half cycle, 90 Trailing edge or Leading edge current waveform can be programmed			Positive or Negative half cycle, 90 Trailing edge or Leading edge current waveform can be programmed			
Master/Slave (3 Phase or Parallel Application)	Yes, 1 master and upto 7 slave units			Yes, 1 master and upto 7 slave units			
External Programming Input (OPTION)	F.S / 10Vdc, Resolution 0.1V			F.S / 10Vdc, Resolution 0.1V			
External SYNC Input	TTL			TTL			
Vmonitor (Isolated)	±500V ±10V			±600V ±10V			
Imonitor (Isolated)	±84Apk / ±10Vpk			±84Apk / ±10Vpk			
Interface (OPTION)	GPIB ; RS-232 ; LAN ; USB			GPIB ; RS-232 ; LAN ; USB			
MAX. Power Consumption	150VA			150VA			
Operation Temperature *2	0 ~ 40 °C			0 ~ 40 °C			
Current of Input Impedance(mA)@50/60Hz ; @ 400Hz	-V*0.3 ; -V*2.2	-V*0.45 ; -V*3.3	-V*0.6 ; -V*4.4	-V*0.3 ; -V*2.2	-V*0.45 ; -V*3.3	-V*0.6 ; -V*4.4	
Dimension (H x W x D)	177 x 440 x 552.6 mm	177 x 440 x 552.6 mm	177 x 440 x 552.6 mm	177 x 440 x 552.6 mm	177 x 440 x 552.6 mm	177 x 440 x 552.6 mm	
Weight	21.5kg	27.5kg	33.5kg	21.5kg	27.5kg	33.5kg	

\*1 ms (millisiemens) is the unit of conductance(G), one siemens equal to 1/Ω

\*2 Operating temperature range is 0-40°C, all specification apply for 25°C±5°C, Except as noted

\*3 Turbo mode for up to 2X Current rating & Power rating support Fuse, Short/OCF/OPP test function

\*4 The specification apply for current less than 20Arms

\* All specifications apply for 50/60Hz

\* All specifications subject to change without notice

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## 規 格

MODEL	AEL-5006-350-56	AEL-5008-350-75	AEL-5012-350-112.5	AEL-5015-350-112.5	AEL-5019-350-112.5	AEL-5023-350-112.5
Power (W)	5600 W	7500 W	11250W	15000 W	18750W	22500W
Current(Ampere)	56 Arms / 168Apeak	75 Arms / 225Apeak	112.5 Arms / 337.5Apeak	112.5 Arms / 337.5Apeak	112.5 Arms / 337.5Apeak	112.5 Arms / 337.5Apeak
Voltage(Volt)	50-350Vrms / 500Vdc					
FREQUENCY Range	DC,40-440Hz(CC,CP Mode), DC-440Hz(LIN,CR,CV Mode)					
<b>PROTECTIONS</b>						
Over Power Protection	≒ 5880Wrms or Programmable	≒ 7875Wrms or Programmable	≒ 11812.5Wrms or Programmable	≒ 11812.5Wrms or Programmable	≒ 19687.5Wrms or Programmable	≒ 23625Wrms or Programmable
Over Current Protection	≒ 58.8 Arms, or Programmable	≒ 78.75 Arms, or Programmable	≒ 118.125 Arms or Programmable	≒ 118.125 Arms or Programmable	≒ 118.125 Arms or Programmable	≒ 118.125 Arms or Programmable
Over Voltage Protection	≒ 367.5 Vrms/525Vdc					
Over Temp. Protection	Yes					
<b>OPERATION MODE</b>						
Constant Current Mode for Sine-Wave						
Range	0-56A	0-75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
Resolution	1mA/16bits	1.25mA/16bits	1.875mA/16bits	1.875mA/16bits	1.875mA/16bits	1.875mA/16bits
Accuracy	± 1.01% of setting + 0.2% of range   @ 50/60Hz, ± 0.5% of ( setting + range ) @ DC and 400Hz					
Linear Constant Current Mode for Sine-Wave, Square-Wave or Quasi-Square Wave, PWM Wave						
Range	0-56A	0-75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
Resolution	1mA/16bits	1.25mA/16bits	1.875mA/16bits	1.875mA/16bits	1.875mA/16bits	1.875mA/16bits
Accuracy	± 1.01% of setting + 0.2% of range   @ 50/60Hz, ± 0.5% of ( setting + range ) @ DC and 400Hz					
<b>Constant Resistance Mode</b>						
Range	1 ohm - 20k ohm	0.8 ohm - 16k ohm	0.533 ohm - 10.666k ohm	0.533 ohm - 10.666k ohm	0.533 ohm - 10.666k ohm	0.533 ohm - 10.666k ohm
Resolution*1	0.016666mS/16bits	0.020832mS/16bits	0.031248mS/16bits	0.031248mS/16bits	0.031248mS/16bits	0.031248mS/16bits
Accuracy	± 0.2% of ( setting + range ) @ 50/60Hz, ± 0.5% of setting + 2% of range   @ DC and 400Hz					
<b>Constant Voltage Mode</b>						
Range	50-350Vrms / 500Vdc					
Resolution	0.1V					
Accuracy	± 0.2% of ( setting + range ) @ 50/60Hz					
<b>Constant Power Mode</b>						
Range	5600W	7500W	11250W	15000 W	18750W	22500W
Resolution	0.1W	0.1W	1W	1W	1W	1W
Accuracy*4	± 0.5% of ( setting + range ) @ 50/60Hz, ± 2% of ( setting + range )					
<b>CREST FACTOR (CC &amp; CP MODE ONLY)</b>						
Range	-2-5					
Resolution	0.1					
Accuracy	(0.5% / Irms) + 1% F.S.					
<b>POWER FACTOR (CC &amp; CP MODE ONLY)</b>						
Range	0-1 Lag or Lead					
Resolution	0.01					
Accuracy	1% F.S.					
<b>TEST MODE</b>						
<b>UPS Efficient Measurement</b>						
Operating Frequency	Non-Linear Mode Auto: 40-440Hz					
Current Range	0-56A	0-75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
PF Range	0-1					
<b>Measuring Efficiency For PV Systems, Power Conditioners for THD 80%</b>						
Operating Frequency	Resistive + Non-Linear Mode Auto: 40-440Hz					
Current Range	0-56A	0-75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
Resistive Range	1 ohm - 20k ohm	0.8 ohm - 16k ohm	0.533 ohm - 10.666k ohm	0.533 ohm - 10.666k ohm	0.533 ohm - 10.666k ohm	0.533 ohm - 10.666k ohm
<b>UPS Back-Up Function(CC,LIN,CR,CP)</b>						
UPS (VTH)	50-350Vrms / 500Vdc					
UPS Back-Up Time	1-99999 Sec. (-27H)					
<b>Battery Discharge Function(CC,LIN,CR,CP)</b>						
UPS (VTH)	50-350Vrms / 500Vdc					
Battery Discharge Time	1-99999 Sec. (-27H)					
<b>UPS Transfer Time</b>						
Current Range	0-56A	0-75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
LVP (VTH)	2.5V					
Time range	0.15ms-999.99ms					
<b>Fuse Test Mode</b>						
Max. Current	Turbo OFF(CC1-3) Turbo ON(CC3)	56Arms	75Arms	112.5Arms	112.5Arms	112.5Arms
Trip & Non-Trip Time	Turbo OFF(CC1-2) Turbo ON(Time1-3) Turbo ON(Time1-2) Turbo ON(Time3)	112Arms (x2) <sup>*1</sup>	150Arms (x2) <sup>*1</sup>	225Arms (x2) <sup>*3</sup>	225Arms (x2) <sup>*3</sup>	225Arms (x2) <sup>*3</sup>
OFF Time	0.01-333.33 Sec. 0.01-600.00 Sec. 0.1-999.9 Sec. ± 0.003 Sec.					
Meas. Accuracy	0-99999					
Repeat Cycle	0-99999					
<b>Short/OPP/OCF Test Function</b>						
Short Time	Turbo OFF Turbo ON	0.1-10Sec. or Cont. 0.1-15Sec.				
OPP/OCF Step Time	Turbo OFF Turbo ON	100ms 100ms, up to 10 Steps				
OCF Istop	Turbo OFF Turbo ON	56Arms 112Arms	75Arms 150Arms	112.5Arms 225Arms	112.5Arms 225Arms	112.5Arms 225Arms
OPP Pstop	Turbo OFF Turbo ON	5600W 11200W	7500W 15000W	11250W 22500W	15000W 30000W	18750W 37500W
<b>Programmable Inrush Current Simulation: Istart - Istop / Tsep</b>						
Istart, Inrush Start Current	0-112A	0-150A	0-225A	0-225A	0-225A	0-225A
Inrush Step Time	0.1ms-100ms					
Istop, Inrush Stop Current	0-56A	0-75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
<b>Programmable Surge Current Simulation: S1/T1 - S2/T2 - S3/T3</b>						
S1 and S2 Current	0-112A	0-150A	0-225A	0-225A	0-225A	0-225A
T1 and T2 Time	0.01-0.55Sec.					
S3 Current	0-56A	0-75A	0-112.5A	0-112.5A	0-112.5A	0-112.5A
T3 Time	0.01-9.99Sec. or Cont.					
<b>MEASUREMENTS</b>						
<b>VOLTAGE READBACK V METER</b>						
Range	500V					
Resolution	0.01V					
Accuracy	± 0.05% of ( reading + range )					
Parameter	Vrms, V Max/Min, +/-Vpk					
<b>CURRENT READBACK A METER</b>						
Range	28Arms/56Arms	37.5Arms/75Arms	56.25Arms/112.5Arms	56.25Arms/112.5Arms	56.25Arms/112.5Arms	56.25Arms/112.5Arms
Resolution	0.6mA/1.2mA	0.8mA/1.6mA	1.2mA/2.4mA	1.2mA/2.4mA	1.2mA/2.4mA	1.2mA/2.4mA
Accuracy	± 0.1% of ( reading + range ) @ 50/60Hz					
Parameter	Irms, I Max/Min, +/-Ipk					
<b>WATT READBACK W METER</b>						
Range	5600W	7500W	11250W	15000W	18750W	22500W
Resolution	0.1W	0.125W	0.1875W	0.25W	0.3125W	0.375W
Accuracy*4	± 0.5% of ( reading + range ) @ 50/60Hz, ± 2% of ( reading + range )					
VA METER	Vrms x Arms Correspond To Vrms and Arms					
Power Factor METER	+/- 0.000-1.000 ± (0.002 ± (0.001 / PF) * F)					
Frequency METER(Hz)	DC,40-440Hz					
Range	0.1%					
Accuracy	0.1%					
Other Parameter METER	VA, VAR, CF, I, Ipeak, Imax, Imin, Vmax, Vmin, IHD, VHD, ITHD, VTHD					
<b>OTHERS</b>						
Start up Loading	Yes, Power on loading during Inverter / UPS start up					
Load ON / OFF Angle	0 - 359 degree can be programmed for the angle of load ON and load OFF loading					
Half Cycle and SCR/TRIAC Loading	Positive or Negative half cycle, 90° Trailing edge or Leading edge current waveform can be programmed					
Master/Slave (3 Phase or Parallel Application)	Yes, 1 master and upto 7 slave unit					
External Programming Input (OPTION)	F.S / 10Vdc, Resolution 0.1V					
External SYNC Input	TTL					
Vmonitor (Isolated)	± 500V / ± 10V					
Imonitor (Isolated)	± 168Apk / ± 10Vpk	± 225Apk / ± 10Vpk	± 337.5Apk / ± 10Vpk	± 337.5Apk / ± 10Vpk	± 337.5Apk / ± 10Vpk	± 337.5Apk / ± 10Vpk
Interface (OPTION)	GPIB ; RS-232 ; LAN ; USB					
MAX. Power Consumption	270VA	270VA	390VA	510VA	630VA	750VA
Operation Temperature *2	0 - 40 °C					
Current of Input Impedance(mA)@50/60Hz ; @ 400Hz	-V*0.9 ; -V*6	-V*1.2 ; -V*8	-V*1.8 ; -V*13.2	-V*2.4 ; -V*17.6	-V*3.0 ; -V*22	-V*3.6 ; -V*26.4
Dimension (H x W x D)	457.8 x 480 x 593 mm	457.8 x 480 x 593 mm	635.7 x 480 x 593 mm	813.5 x 480 x 593 mm	1283 x 600 x 600 mm	1283 x 600 x 600 mm
Weight	58 kg	70 kg	105kg	140kg	260kg	295kg

\*1 ms (millisemens) is the unit of conductance(G), one siemens equal to 1/Ω

\*2 Operating temperature range is 0-40°C, all specification apply for 25°C±5°C, Except as noted

\*3 Turbo mode for up to 2X Current rating & Power rating support Fuse, Short/OCF/OPP test function

\*4 The specification apply for current less than 20Arms

\* All specifications apply for 50/60Hz

\* All specifications subject to change without notice



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MODEL	AEL-5006-425-56	AEL-5008-425-75	AEL-5012-425-112.5	AEL-5015-425-112.5	AEL-5019-425-112.5	AEL-5023-425-112.5
Power (W)	5600 W	7500 W	11250 W	15000 W	18750 W	22500 W
Current(Ampere)	56 Arms / 168Apeak	75 Arms / 225Apeak	112.5 Arms / 337.5Apeak	112.5 Arms / 337.5Apeak	112.5 Arms / 337.5Apeak	112.5 Arms / 337.5Apeak
Voltage(Volt)	50~425Vrms / 600Vdc					
FREQUENCY Range	DC,40~440Hz(CC,CP Mode) , DC~440Hz(LIN,CR,CV Mode)					
<b>PROTECTIONS</b>						
Over Power Protection	≠ 5880Wrms or Programmable	≠ 7875Wrms or Programmable	≠ 11812.5Wrms or Programmable	≠ 15750Wrms or Programmable	≠ 19687.5Wrms or Programmable	≠ 23625Wrms or Programmable
Over Current Protection	≠ 58.8 Arms, or Programmable	≠ 78.75 Arms, or Programmable	≠ 118.125 Arms or Programmable	≠ 118.125 Arms or Programmable	≠ 118.125 Arms or Programmable	≠ 118.125 Arms or Programmable
Over Voltage Protection	≠ 446.25 Vrms/630Vdc					
Over Temp. Protection	Yes					
<b>OPERATION MODE</b>						
<b>Constant Current Mode for Sine-Wave</b>						
Range	0~56A	0~75A	0~112.5A	0~112.5A	0~112.5A	0~112.5A
Resolution	1mA/16bits	1.25mA/16bits	1.875mA/16bits	1.875mA/16bits	1.875mA/16bits	1.875mA/16bits
Accuracy	± ( 0.1% of setting + 0.2% of range ) @ 50/60Hz, ± 0.5% of ( setting + range ) @ DC and 400Hz					
<b>Linear Constant Current Mode for Sine-Wave, Square-Wave or Quasi-Square Wave, PWM Wave</b>						
Range	0~56A	0~75A	0~112.5A	0~112.5A	0~112.5A	0~112.5A
Resolution	1mA/16bits	1.25mA/16bits	1.875mA/16bits	1.875mA/16bits	1.875mA/16bits	1.875mA/16bits
Accuracy	± ( 0.1% of setting + 0.2% of range ) @ 50/60Hz, ± 0.5% of ( setting + range ) @ DC and 400Hz					
<b>Constant Resistance Mode</b>						
Range	1 ohm ~ 20k ohm	0.8 ohm ~ 16k ohm	0.533 ohm ~ 10.666k ohm	0.533 ohm ~ 10.666k ohm	0.533 ohm ~ 10.666k ohm	0.533 ohm ~ 10.666k ohm
Resolution*1	0.01666mS/16bits	0.020832mS/16bits	0.031248mS/16bits	0.031248mS/16bits	0.031248mS/16bits	0.031248mS/16bits
Accuracy	±0.2% of ( setting + range ) @ 50/60Hz, ± 0.5% of setting + 2% of range ! @ DC and 400Hz					
<b>Constant Voltage Mode</b>						
Range	50~425Vrms / 600Vdc					
Resolution	0.1V					
Accuracy	±0.2% of ( setting + range ) @ 50/60Hz					
<b>Constant Power Mode</b>						
Range	5600W	7500W	11250W	15000W	18750W	22500W
Resolution	0.1W	0.1W	1W	1W	1W	1W
Accuracy*4	±0.5% of ( setting + range ) @ 50/60Hz, ±2% of ( setting + range )					
<b>CREST FACTOR (CC &amp; CP MODE ONLY)</b>						
Range	√2~5					
Resolution	0.1					
Accuracy	(0.5% / Irms) + 1% F.S.					
<b>POWER FACTOR (CC &amp; CP MODE ONLY)</b>						
Range	0~1 Lag or Lead					
Resolution	0.01					
Accuracy	1% F.S.					
<b>TEST MODE</b>						
<b>UPS Efficient Measurement</b>						
Operating Frequency	Non-Linear Mode Auto : 40~440Hz					
Current Range	0~56A	0~75A	0~112.5A	0~112.5A	0~112.5A	0~112.5A
PF Range	0~1					
<b>Measuring Efficiency For PV Systems, Power Conditioners for THD 80%</b>						
Operating Frequency	Resistive + Non-Linear Mode Auto : 40~440Hz					
Current Range	0~56A	0~75A	0~112.5A	0~112.5A	0~112.5A	0~112.5A
Resistive Range	1 ohm ~ 20k ohm	0.8 ohm ~ 16k ohm	0.533 ohm ~ 10.666k ohm	0.533 ohm ~ 10.666k ohm	0.533 ohm ~ 10.666k ohm	0.533 ohm ~ 10.666k ohm
<b>UPS Back-Up Function(CC,LIN,CR,CP)</b>						
UVP (VTH)	50~425Vrms / 600Vdc					
UPS Back-Up Time	1~99999 Sec. (>27H)					
<b>Battery Discharge Function(CC,LIN,CR,CP)</b>						
UVP (VTH)	50~425Vrms / 600Vdc					
Battery Discharge Time	1~99999 Sec. (>27H)					
<b>UPS Transfer Time</b>						
Current Range	0~56A	0~75A	0~112.5A	0~112.5A	0~112.5A	0~112.5A
UVP (VTH)	2.5V					
Time range	0.15ms~999.99ms					
<b>Fuse Test Mode</b>						
Max. Current	Turbo OFF(CC1~3)	56Arms	75Arms	112.5Arms	112.5Arms	112.5Arms
	Turbo ON(CC3)					
	Turbo ON(CC1~2)	112Arms (x2) <sup>†3</sup>	150Arms (x2) <sup>†3</sup>	225Arms (x2) <sup>†3</sup>	225Arms (x2) <sup>†3</sup>	225Arms (x2) <sup>†3</sup>
Trip & Non-Trip Time	Turbo OFF(Time1~3)			0.01~333.33 Sec.		
	Turbo ON(Time1~2)			0.01~600.00 Sec.		
	Turbo ON(Time3)			0.01~999.9 Sec.		
OFF Time	0.1~999.9 Sec.					
Meas. Accuracy	±0.003 Sec.					
Repeat Cycle	0~99999					
<b>Short/OPP/OCF Test Function</b>						
Short Time	Turbo OFF	0.1~10Sec. or Cont.				
	Turbo ON	0.1~1Sec.				
OPP/OCF Step Time	Turbo OFF	100ms				
	Turbo ON	100ms, up to 10 Steps				
OCF Istop	Turbo OFF	56Arms	75Arms	112.5Arms	112.5Arms	112.5Arms
	Turbo ON	112Arms	150Arms	225Arms	225Arms	225Arms
OPP Pstop	Turbo OFF	5600W	7500W	11250W	15000W	18750W
	Turbo ON	11200W	15000W	22500W	30000W	45000W
<b>Programmable Inrush Current Simulation: Istart - Istop / Tsep</b>						
Istart, Inrush Start Current	0~112A	0~150A	0~225A	0~225A	0~225A	0~225A
Inrush Stop Time	0.1ms~100ms					
Istop, Inrush Stop Current	0~56A	0~75A	0~112.5A	0~112.5A	0~112.5A	0~112.5A
<b>Programmable Surge Current Simulation: S1/T1 - S2/T2 - S3/T3</b>						
S1 and S2 Current	0~112A	0~150A	0~225A	0~225A	0~225A	0~225A
T1 and T2 Time	0.01~0.5Sec.					
S3 Current	0~56A	0~75A	0~112.5A	0~112.5A	0~112.5A	0~112.5A
T3 Time	0.01~9.99Sec. or Cont.					
<b>MEASUREMENTS</b>						
<b>VOLTAGE READBACK V METER</b>						
Range	600V					
Resolution	0.01V					
Accuracy	±0.05% of ( reading + range )					
Parameter	Vrms, V Max/Min, +/-Vpk					
<b>CURRENT READBACK A METER</b>						
Range	28Arms/56Arms	37.5Arms/75Arms	56.25Arms/112.5Arms	56.25Arms/112.5Arms	56.25Arms/112.5Arms	56.25Arms/112.5Arms
Resolution	0.6mA/1.2mA	0.8mA/1.6mA	1.2mA/2.4mA	1.2mA/2.4mA	1.2mA/2.4mA	1.2mA/2.4mA
Accuracy	±0.1% of ( reading + range ) @ 50/60Hz					
Parameter	Irms, I Max/Min, +/-Ipk					
<b>WATT READBACK W METER</b>						
Range	5600W	7500W	11250W	15000W	18750W	22500W
Resolution	0.1W	0.125W	0.1875W	0.25W	0.3125W	0.375W
Accuracy*4	±0.5% of ( reading + range ) @ 50/60Hz, ±3% of ( reading + range )					
VA METER	Vrms x Arms Correspond To Vrms and Arms					
Power Factor METER						
Range	+/- 0.000~1.000					
Accuracy	±(0.002±(0.001)/PF)*F					
Frequency METER(Hz)						
Range	DC,40~440Hz					
Accuracy	0.1%					
Other Parameter METER	VA, VAR, CF, I, Ipeak, Imax., Imin, Vmax., Vmin., IHD, VHD, ITHD, VTHD					
<b>OTHERS</b>						
Start up Loading	Yes, Power on loading during Inverter / UPS start up					
Load ON / OFF Angle	0 ~ 359 degree can be programmed for the angle of load ON and load OFF loading					
Half Cycle and SCR/TRIAC Loading	Positive or Negative half cycle, 90° Trailing edge or Leading edge current waveform can be programmed					
Master/Slave (3 Phase or Parallel Application)	Yes, 1 master and upto 7 slave unit					
External Programming Input (OPTION)	F.S / 10Vdc, Resolution 0.1V					
External SYNC Input	TTL					
Vmonitor (Isolated)	±600V / ±10V					
Imonitor (Isolated)	±168Apk / ±10Vpk	±225Apk / ±10Vpk	±337.5Apk / ±10Vpk	±337.5Apk / ±10Vpk	±337.5Apk / ±10Vpk	±337.5Apk / ±10Vpk
Interface (OPTION)	GPIB ; RS-232 ; LAN ; USB					
MAX. Power Consumption	270VA	270VA	390VA	510VA	630VA	750VA
Operation Temperature *2	0 ~ 40 °C					
Current of Input Impedance(mA)@50/60Hz ; @ 400Hz	-V*0.9 ; -V*6.6	-V*1.2 ; -V*8.8	-V*1.8 ; -V*13.2	-V*2.4 ; -V*17.6	-V*3.0 ; -V*22	-V*3.6 ; -V*26.4
Dimension( H x W x D )	457.8 x 480 x 593 mm	457.8 x 480 x 593 mm	635.7 x 480 x 593 mm	813.5 x 480 x 593 mm	1283 x 600 x 600 mm	1283 x 600 x 600 mm
Weight	58 kg	70 kg	105kg	140kg	260kg	295kg

\*1 ms (millisiemens) is the unit of conductance(G), one siemens equal to 1/Ω

\*2 Operating temperature range is 0~40°C, all specification apply for 25°C±5°C, Except as noted

\*3 Turbo mode for up to 2X Current rating & Power rating support Fuse, Short/OCF/OPP test function

\*4 The specification apply for current less than 20Arms

\* All specifications apply for 50/60Hz

\* All specifications subject to change without notice

# 交 / 直 流 電 子 負 載

## 規 格

MODEL	AEL-5003-480-18.75	AEL-5004-480-28
Power (W)	2800W	3750 W
Current(Ampere)	18.75 Arms / 56.25Apeak	28 Arms / 84Apeak
Voltage(Volt)	50-480Vrms / 700Vdc	50-480Vrms / 700Vdc
FREQUENCY Range	DC,40-70Hz(CC,CP Mode), DC-70Hz(LIN,CR,CV Mode)	DC,40-70Hz(CC,CP Mode), DC-70Hz(LIN,CR,CV Mode)
<b>PROTECTIONS</b>		
Over Power Protection	≈2940Wrms or Programmable	≈3937.5Wrms or Programmable
Over Current Protection	≈ 19.687 Arms or Programmable	≈ 29.4 Arms or Programmable
Over Voltage Protection	≈ 504Vrms / 735Vdc	≈ 504Vrms / 735Vdc
Over Temp. Protection	Yes	Yes
<b>OPERATION MODE</b>		
Constant Current Mode for Sine-Wave		
Range	0-18.75A	0-28A
Resolution	0.3125mA/16bits	0.5mA/16bits
Accuracy	± ( 0.1% of setting + 0.2% of range ) @ 50/60Hz, ± 0.5% of ( setting + range ) @ DC and 400Hz	± ( 0.1% of setting + 0.2% of range ) @ 50/60Hz, ± 0.5% of ( setting + range ) @ DC and 400Hz
Linear Constant Current Mode for Sine-Wave, Square-Wave or Quasi-Square Wave, PWM Wave		
Range	0-18.75A	0-28A
Resolution	0.3125mA/16bits	0.5mA/16bits
Accuracy	± ( 0.1% of setting + 0.2% of range ) @ 50/60Hz, ± 0.5% of ( setting + range ) @ DC and 400Hz	± ( 0.1% of setting + 0.2% of range ) @ 50/60Hz, ± 0.5% of ( setting + range ) @ DC and 400Hz
<b>Constant Resistance Mode</b>		
Range	4 ohm - 80k ohm	2.5 ohm - 50k ohm
Resolution*1	0.004166mS/16bits	0.006666mS/16bits
Accuracy	±0.2% of ( setting + range ) @ 50/60Hz, ± ( 0.5% of setting + 2% of range ) @ DC and 400Hz	±0.2% of ( setting + range ) @ 50/60Hz, ± ( 0.5% of setting + 2% of range ) @ DC and 400Hz
<b>Constant Voltage Mode</b>		
Range	50-480Vrms / 700Vdc	50-480Vrms / 700Vdc
Resolution	0.0125V	0.0125V
Accuracy	±(0.1% of setting + 0.1% of range)	±(0.1% of setting + 0.1% of range)
<b>Constant Power Mode</b>		
Range	2800W	3750W
Resolution	0.1W	0.1W
Accuracy*4	±0.3% of ( setting + range ) @ 50/60Hz, ±2% of ( setting + range )	±0.3% of ( setting + range ) @ 50/60Hz, ±2% of ( setting + range )
<b>CREST FACTOR (CC &amp; CP MODE ONLY)</b>		
Range	-2-5	-2-5
Resolution	0.1	0.1
Accuracy	(0.5% / Arms) ± 1% F.S.	(0.5% / Arms) ± 1% F.S.
<b>POWER FACTOR (CC &amp; CP MODE ONLY)</b>		
Range	0-1 Lag or Lead	0-1 Lag or Lead
Resolution	0.01	0.01
Accuracy	1% F.S.	1% F.S.
<b>TEST MODE</b>		
UPS Efficient Measurement		
Operating Frequency	Auto; 40-70Hz	Auto; 40-70Hz
Current Range	0-18.75A	0-28A
PF Range	0-1	0-1
Measuring Efficiency for PV Systems, Power Conditioners for THD 80%		
Operating Frequency	Auto; 40-70Hz	Auto; 40-70Hz
Current Range	0-18.75A	0-28A
Resistive Range	4 ohm - 80k ohm	2.5 ohm - 50k ohm
<b>UPS Back-Up Function(CC,LIN,CR,CP)</b>		
UVP (VTH)	50-480Vrms / 700Vdc	50-480Vrms / 700Vdc
UPS Back-Up Time	1-99999 Sec. (>27H)	1-99999 Sec. (>27H)
<b>Battery Discharge Function(CC,LIN,CR,CP)</b>		
UVP (VTH)	50-480Vrms / 700Vdc	50-480Vrms / 700Vdc
Battery Discharge Time	1-99999 Sec. (>27H)	1-99999 Sec. (>27H)
<b>UPS Transfer Time</b>		
Current Range	0-18.75A	0-28A
LVP (VTH)	2.5V	2.5V
Time range	0.15ms-999.99ms	0.15ms-999.99ms
<b>Fuse Test Mode</b>		
Max. Current	Turbo OFF(CC1-3) Turbo ON(CC3) Turbo ON(CC1-2) 37.5Arms (x2) *3	28.0Arms 56.0Arms (x2) *3
Trip & Non-Trip Time	Turbo OFF(Time1-3) Turbo ON(Time1-2) Turbo ON(Time3)	0.01-333.33 Sec. 0.01-0.50 Sec. 0.01-600.00 Sec. 0.1-999.9 Sec. ±0.003 Sec.
OFF Time	Repeat Cycle	0-99999
<b>Short/OPP/OCF Test Function</b>		
Short Time	Turbo OFF Turbo ON	100ms
OPP/OCF Step Time	Turbo OFF Turbo ON	100ms, up to 10 Steps
OCF Istop	Turbo OFF Turbo ON	18.75Arms 37.5Arms
OPP Pstop	Turbo OFF Turbo ON	2800W 5600W
<b>Programmable Inrush Current Simulation: Istart - Istop / Tsep</b>		
Istart, Inrush Start Current	0-37.5k	0-56A k
Inrush Step Time	0.1ms-100ms	0.1ms-100ms
Istop, Inrush Stop Current	0-18.75A	0-28A
<b>Programmable Surge Current Simulation: S1/T1 - S2/T2 - S3/T3</b>		
S1 and S2 Current	0-37.5A	0-56A
T1 and T2 Time	0.01-0.5Sec.	0.01-0.5Sec.
S3 Current	0-18.75A	0-28A
T3 Time	0.01-9.99Sec. or Cont.	0.01-9.99Sec. or Cont.
<b>MEASUREMENTS</b>		
<b>VOLTAGE READBACK V METER</b>		
Range	700V	700V
Resolution	0.0125V	0.0125V
Accuracy	±0.05% of ( reading + range )	±0.05% of ( reading + range )
Parameter	Vrms,V Max/Min,+/-Vpk	Vrms,V Max/Min,+/-Vpk
<b>CURRENT READBACK A METER</b>		
Range	9.375Arms/18.75Arms	14Arms/28Arms
Resolution	0.2mA/0.4mA	0.3mA/0.6mA
Accuracy	±0.05% of ( reading + range ) @ 50/60Hz	±0.05% of ( reading + range ) @ 50/60Hz
Parameter	Irms,I Max/Min,+/-Ipk	Irms,I Max/Min,+/-Ipk
<b>WATT READBACK W METER</b>		
Range	2800W	3750W
Resolution	0.05W	0.0625W
Accuracy*4	±0.3% of ( reading + range ) @ 50/60Hz, ±2% of ( reading + range )	±0.3% of ( reading + range ) @ 50/60Hz, ±2% of ( reading + range )
VA METER	VrmsArms Correspond To Vrms and Arms	
Power Factor METER	+/- 0.000-1.000	
Accuracy	±(0.002±(0.001/PF)*F)	
Frequency METER(Hz)		
Range	DC,40-70Hz	DC,40-70Hz
Accuracy	0.1%	0.1%
Other Parameter METER		
VA, VAR, CF, L, Ipeak, Imax., Imin, Vmax., Vmin., IHD, VHD, ITHD, VTHD		
<b>OTHERS</b>		
Start up Loading	Yes, Power on loading during Inverter / UPS start up	
Load ON / OFF Angle	0 - 359 degree can be programmed for the angle of load ON and Load OFF loading	
Half Cycle and SCR/TRIAC Loading	Positive or Negative half cycle, 90° Trailing edge or Leading edge current waveform can be programmed	
Master/Slave (3 Phase or Parallel Application)	Yes, 1 master and upto 7 slave units	
External Programming Input (OPTION)	F.S / 10Vdc, Resolution 0.1V	
External SYNC Input	TTL	
Vmonitor (Isolated)	±700V / ±10V	
Imonitor (Isolated)	±56.25Apk / ±10Vpk	
Interface (OPTION)	GPIB ; RS-232 ; LAN ; USB	
MAX. Power Consumption	150VA	
Operation Temperature *2	0 - 40 °C	
Current of Input Impedance(mA)@50/60Hz ; @ 400Hz	-V*0.3 ; -V*2.2	
Dimension( H x W x D )	177 x 440 x 552.6 mm	
Weight	27.5kg	

\*1 ms (millisiemens) is the unit of conductance(C), one siemens equal to 1/Ω

\*2 Operating temperature range is 0-40 °C, all specification apply for 25 °C ±5 °C, Except as noted

\*3 Turbo mode for up to 2X Current rating & Power rating support Fuse, Short/OCF/OPP test function

\*4 The specification apply for current less than 20Arms

\* All specifications apply for 50/60Hz

\* All specifications subject to change without notice

PEL-022 GPIB Card



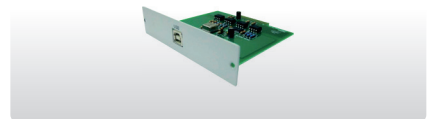
PEL-023 RS-232 Card



PEL-024 LAN Card



PEL-025 USB Card



PEL-028 HANDLES, U-shaped handle  
(for AEL-5006/5008/5012/5015)



PEL-029 HANDLES Rack Accessories  
(for AEL-5002/5003/5004)



## 訂 購 資 訊

AEL-5002-350-18.75	350V/18.75A/1875W	交/直流電子負載
AEL-5003-350-28	350V/28A/2800W	交/直流電子負載
AEL-5004-350-37.5	350V/37.5A/3750W	交/直流電子負載
AEL-5006-350-56	350V/56A/5600W	交/直流電子負載
AEL-5008-350-75	350V/75A/7500W	交/直流電子負載
AEL-5012-350-112.5	350V/112.5A/11250W	交/直流電子負載
AEL-5015-350-112.5	350V/112.5A/15000W	交/直流電子負載
AEL-5019-350-112.5	350V/112.5A/18750W	交/直流電子負載
AEL-5023-350-112.5	350V/112.5A/22500W	交/直流電子負載
AEL-5002-425-18.75	425V/18.75A/1875W	交/直流電子負載
AEL-5003-425-28	425V/28A/2800W	交/直流電子負載
AEL-5004-425-37.5	425V/37.5A/3750W	交/直流電子負載
AEL-5006-425-56	425V/56A/5600W	交/直流電子負載
AEL-5008-425-75	425V/75A/7500W	交/直流電子負載
AEL-5012-425-112.5	425V/112.5A/11250W	交/直流電子負載
AEL-5015-425-112.5	425V/112.5A/15000W	交/直流電子負載
AEL-5019-425-112.5	425V/112.5A/18750W	交/直流電子負載
AEL-5023-425-112.5	425V/112.5A/22500W	交/直流電子負載
AEL-5003-480-18.75	480V/18.75A/2800W	交/直流電子負載
AEL-5004-480-28	480V/28A/3750W	交/直流電子負載



### AEL-5015-425-112.5

Power rating: 15-> 15kW

Maximum output current:  
112.5-> 112.5A

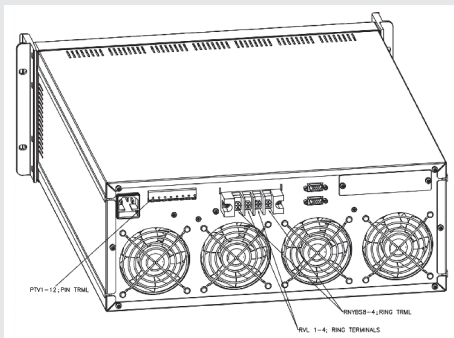
Maximum output voltage:  
425-> 425V

#### STANDARD ACCESSORIES

AEL-5000 Series operation manual

HD-DSUB : 15pin MALE to MALE 150cm x 1

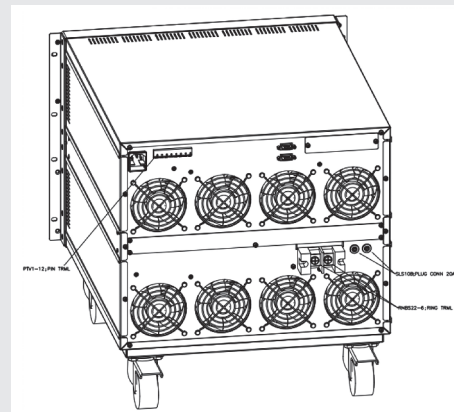
PTV1-12 PIN TRML : Please refer to Fig.1 x 6



AEL-5002-xxx-18.75/AEL-5003-xxx-28/AEL-5004-xxx-37.5

PVL 1-4 RING TERMINALS : Please refer to Fig.4 x 2

RNYBS8-4 RING TRML : Please refer to Fig.5 x 2



AEL-5006-xxx-56/AEL-5008-xxx-78/AEL-5012-xxx-112.5/

AEL-5015-xxx-112.5/AEL-5019-xxx-112.5/AEL-5023-xxx/112.5

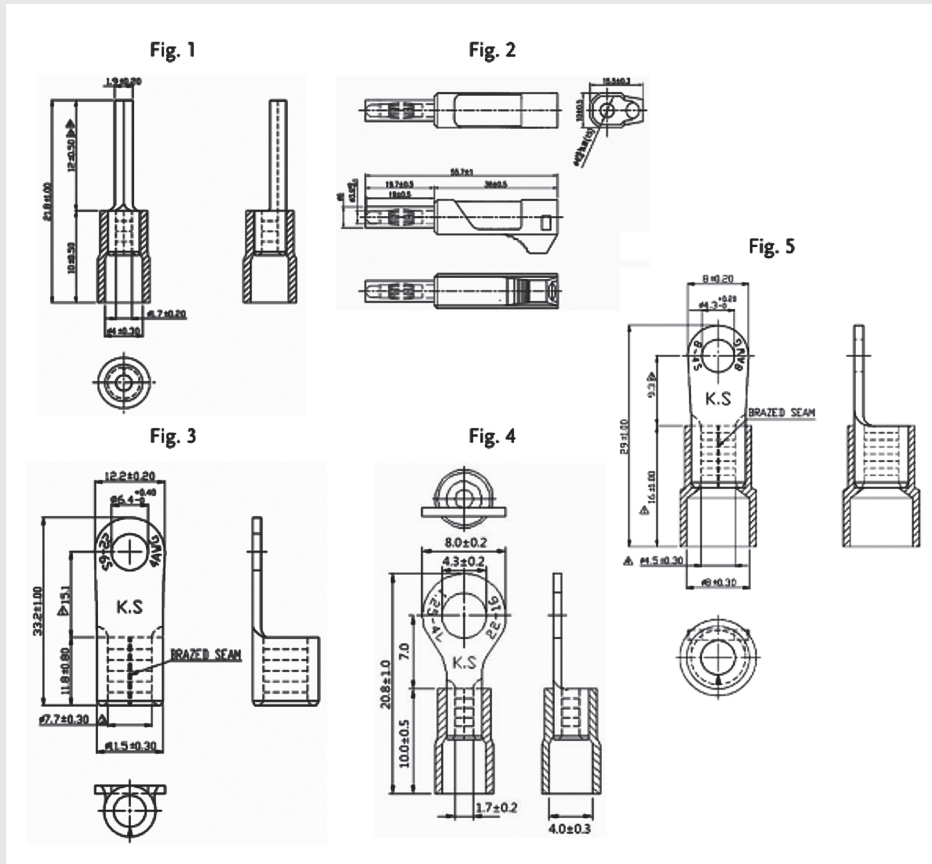
SLS10B RED PLUG CONN 20A RED : Please refer to Fig.2;

The terminal is used for Vsense x 1

SLS10B BLK PLUG CONN 20A BLK : Please refer to Fig.2;

The terminal is used for Vsense x 1

RNB S22-6 RING TRML, #4 : Please refer to Fig.3 x 2



### 選購介面

PEL-022	GPIB Card	GTL-246	USB Cable, USB 2.0, A-B Type, 1200mm
PEL-023	RS-232 Card	GTL-248	GPIB Cable, Double Shielded, 2000mm
PEL-024	LAN Card	GTL-250	GPIB Cable, Double Shielded, 600mm
PEL-025	USB Card		
PEL-028	HANDLES, U-shaped handle(fixed to the bracket)(for AEL-5006/5008/5012/5015)		
PEL-029	HANDLES Rack Accessories(for AEL-5002/5003/5004)		
PEL-030	GPIB+RS-232 Card		

Note: \* Regarding the product delivery date, please contact your regional sales representative.

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