新產品暨重點產品說明

台達資通訊電源方案事業部 應用技術資深副理 陳仲倉

Dec. 10, 2020

Agenda

- UPS新產品介紹
- 精密空調新產品介紹
- 問與答

UPS

停產及新機種-單相機

射手座Plus R系列
1/2/3kVA

射手座N系列
1/2/3kVA

RT系列
5/7/11kVA

N系列獅子座
6/12kVA

New RT系列
1/2/3kVA

Nx系列
1/2/3kVA

New RT系列
5/6/10kVA

停產及新機種-三相機

HPH Gen.1
20/30/40kVA(標準機)

NH+模組式
20/40/60/80/100/120kVA

DPS塔式
200/400/500kVA

2021 Q2

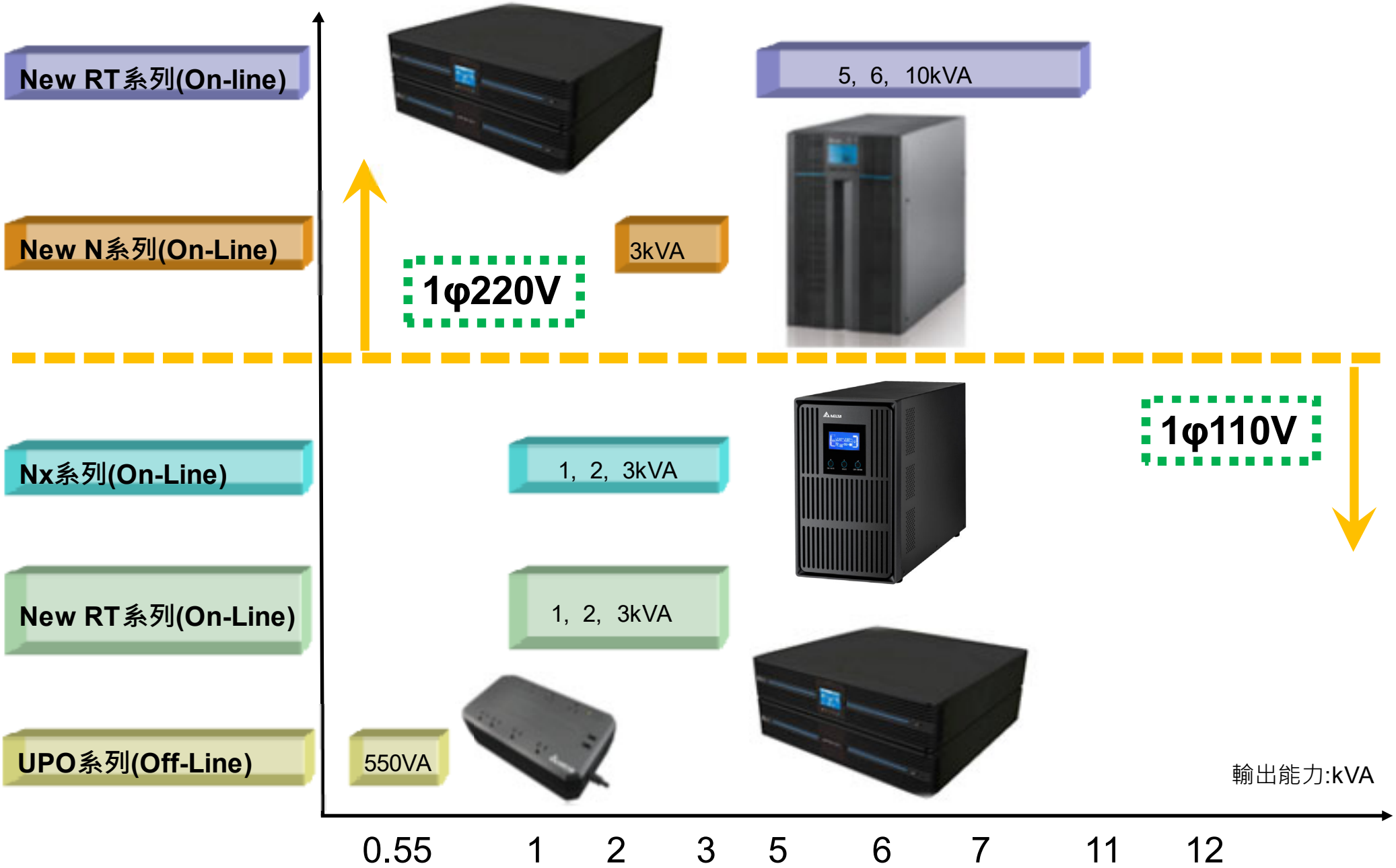
New RT系列
15/20/kVA

HPH Gen.2
20/30/40kVA

DPH 80/120模組式
20/40/60/80/100/120kVA

New DPS
300/400/500/600kVA

UPS單相機產品線



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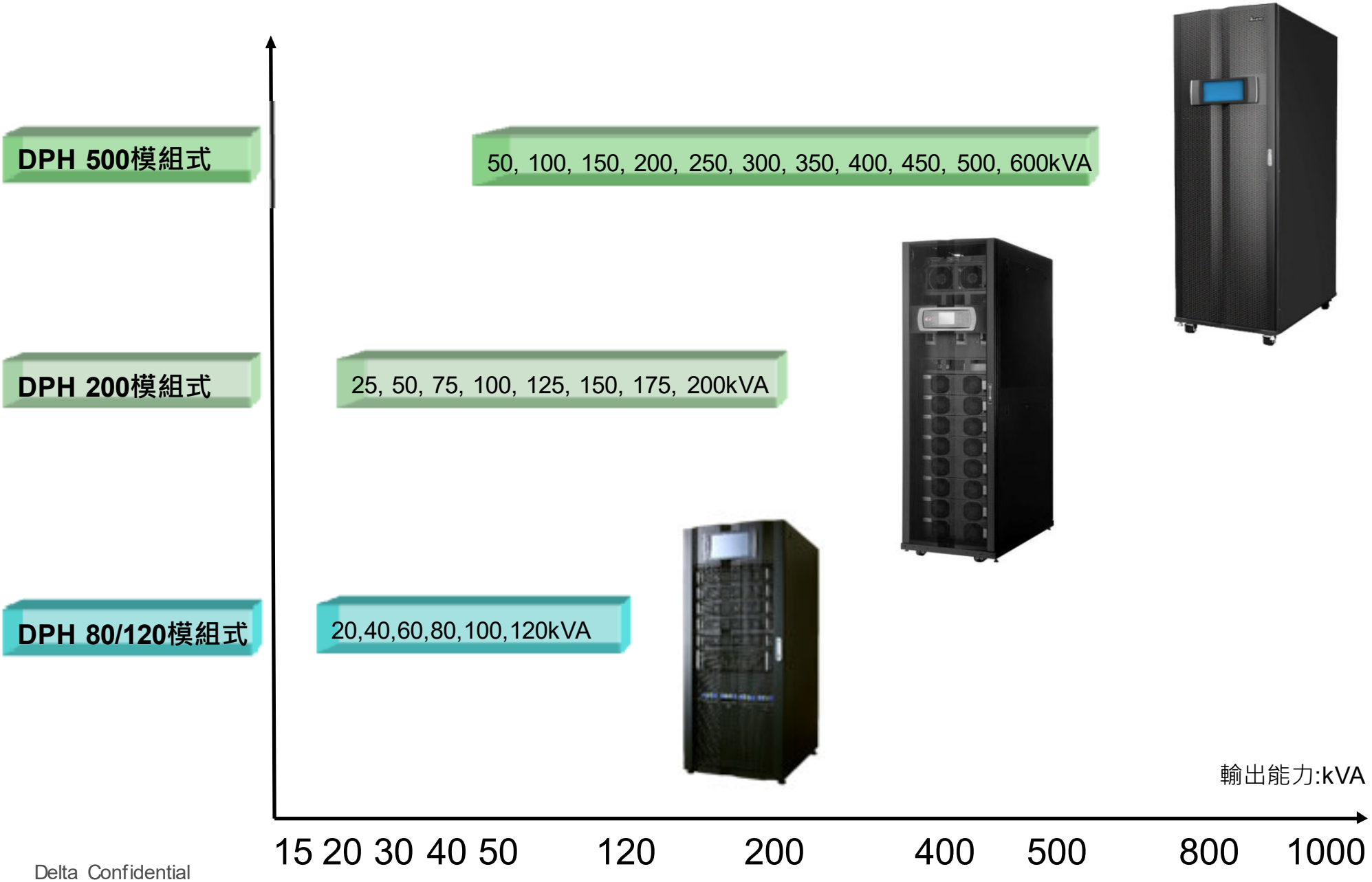
UPS三相機產品線-模組式



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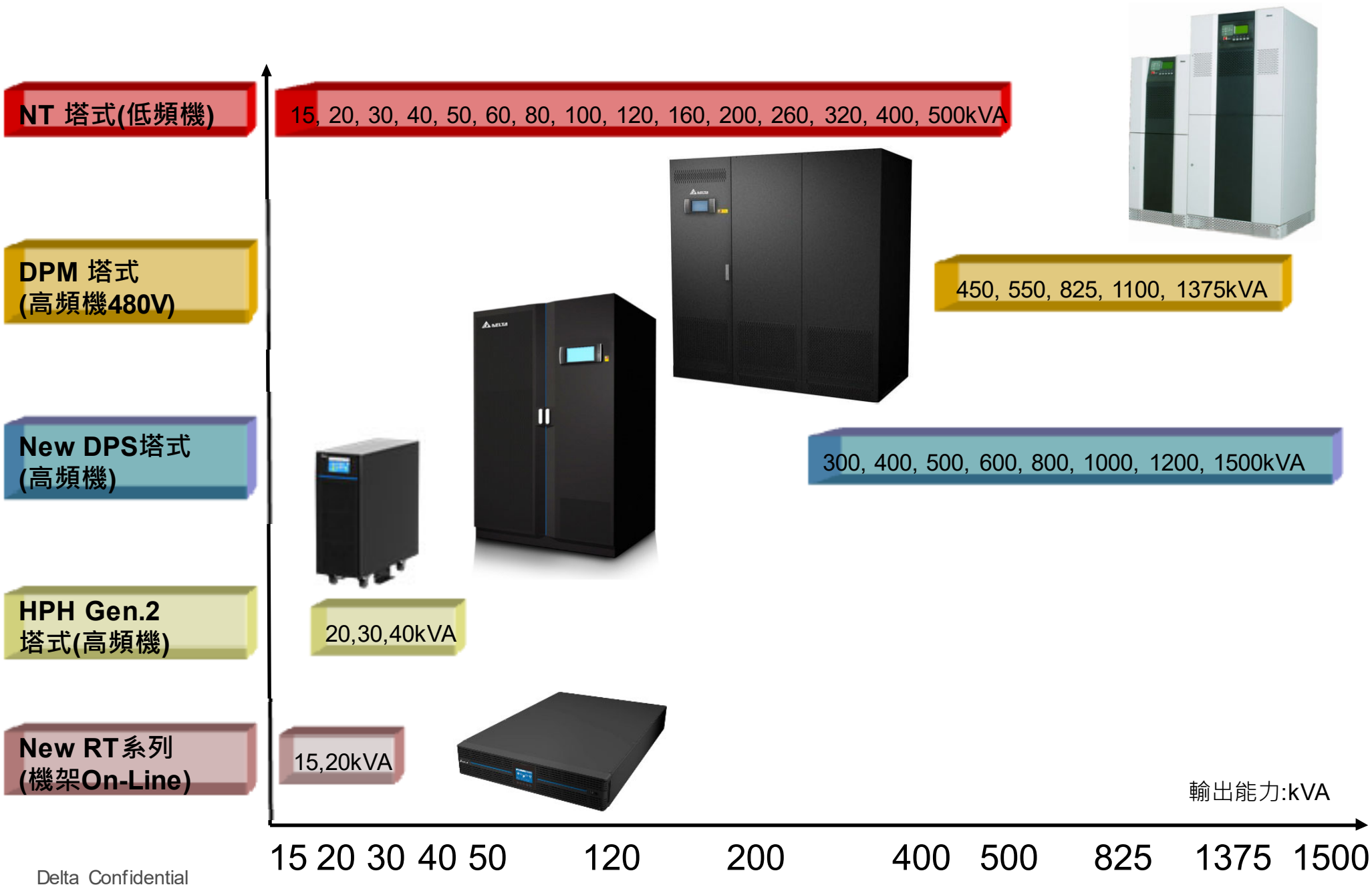
UPS三相機產品線-塔式



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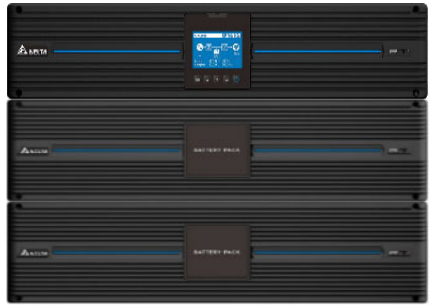
new RT系列

Online - Rack Mountable



RT 1/ 2/ 3kVA 100-120V
- 1:1
- Tower or rack in 2U
- O/P PF: 0.9
- Graphic LCD
- AC-AC efficiency: up to 92%
- ECO efficiency: up to 98%

RT 5/ 6/ 10kVA 200-240V
- 1:1
- Tower or rack in 2U
- O/P PF: Unity
- Graphic LCD
- AC-AC efficiency: up to 94%
- ECO efficiency: 98.5%
- Parallel expansion: up to 4 units
- Li-ion EBC compatibility

RT 15/ 20kVA 380-415V
- 3:1/3:3
- Tower or rack in 2U
- O/P PF: Unity
- Graphic LCD
- AC-AC efficiency: up to 96%
- ECO efficiency: up to 99.5%
- Parallel expansion: up to 4 units
- Li-ion EBC compatibility

All ENERGY STAR certified

RT 1-3kVA規格說明

Product Snapshot

Power rating:	1/2/3 kVA
Technology:	True online double-conversion design
Voltage:	Input: 100 ~ 150 Vac (full load) Output: 100*/110/115/120 Vac ±1%
Frequency:	Input: 40 ~ 70 Hz (auto selectable) Output: 50/60 Hz ± 0.05 Hz
Power Factor	Input power factor >0.99 Output power factor: 0.9
Efficiency	AC-AC mode: up to 92% ECO mode: up to 98%

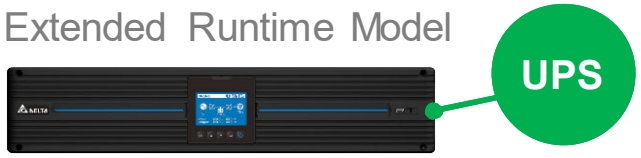
Note: The UPS capacity will be de-rated to 90% at 100Vac

RT 5-10kVA規格說明

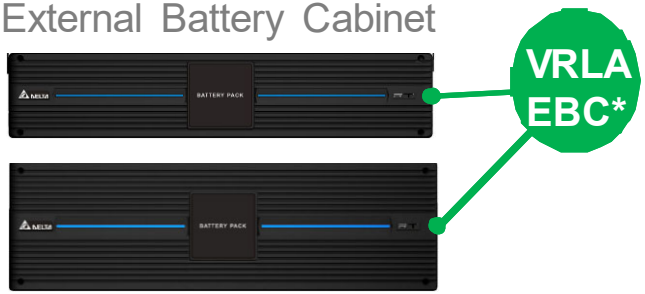
Product Snapshot

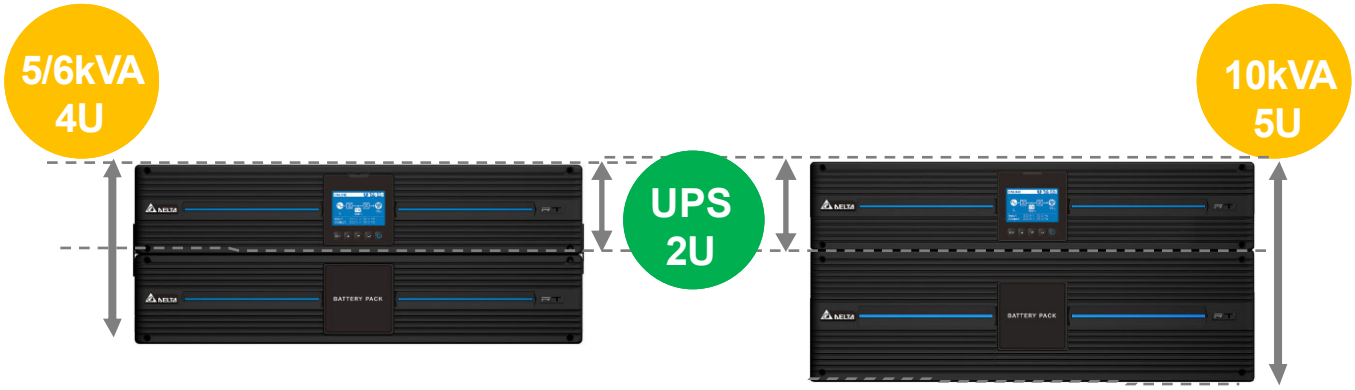
Power rating	5/6/10 kVA
Voltage	Input: 175 ~ 280 Vac (full load) Output: 200/208/220/230(default)/240 Vac
Frequency	Input: 40 ~ 70 Hz Output: 50/60 Hz (auto selectable)
Output Power Factor	Unity
Efficiency	AC-AC mode: up to 94% ECO mode: up to 98.5%
Battery Volt.	144, 192-264Vdc
Form Factor	2U

Extended Runtime Model



External Battery Cabinet





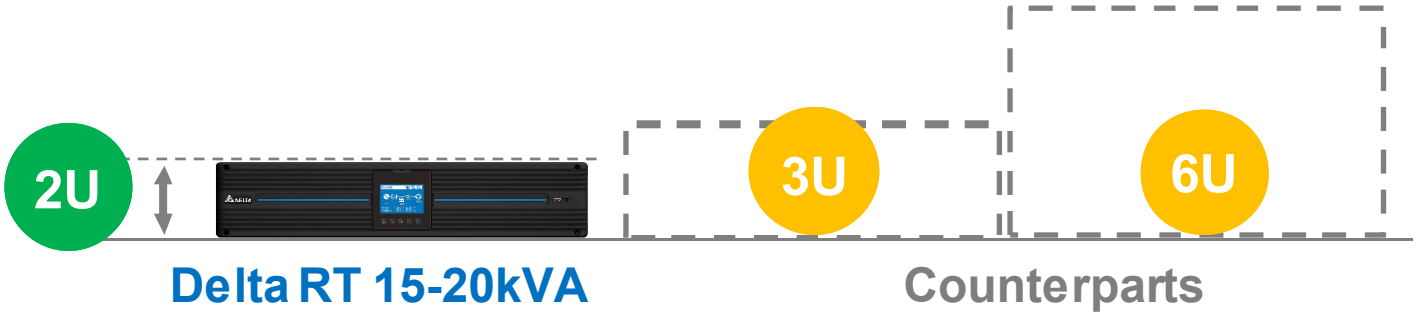
- EBC: External Battery Cabinet,
- PDB: Power Distribution Box,
- MBB: Maintenance Bypass Breaker

RT 15/20kVA規格說明

Product Snapshot

Power rating	15/20 kVA
Voltage	Input: 305 ~ 485 Vac (full load) Output: 380/400(default)/415 Vac
Frequency	Input: 40 ~ 70 Hz Output: 50/60 Hz (auto selectable)
Output Power Factor	Unity
Efficiency	AC-AC mode: up to 96% ECO mode: up to 99.5%
Battery Volt.	15/20kVA: ±144, ±192-264Vdc
Form Factor	2U

- EBC: External Battery Cabinet,
- PDB: Power Distribution Box,
- MBB: Maintenance Bypass Breaker



新舊RT 1-3kVA差異說明

	RT 1-3kVA	GAIA 1-3kVA(射手座Plus)
Power rating (kVA)	1/2/3	1/2/3
Power rating (kW)	0.9/1.8/2.7	0.8/1.6/2.4
O/P PF	0.9	0.8
Efficiency (AC-AC)	Up to 91/92/92%	87%
Efficiency (ECO)	Up to 97.5/98/98%	Not available
Outlet	1k: NEMA 5-15Rx8 2k: NEMA 5-20Rx8, L5-20Rx1 3k: NEMA 5-20Rx8, L5-30Rx1	1k: NEMA 5-15x2x3 2k: NEMA 5-20x6, L5-20x1 3k: NEMA 5-20x6, L5-30x1
Battery voltage	24/48/72Vdc (9Ah)	24/48/72Vdc (8.5Ah)
Backup time	4mins @ full load	4mins @ full load
Recharge time (internal battery)	3hrs to 90%	6hrs to 90%
Display	LCD	LED
Communication	RS232, USB, Mini slot, REPO/ROO, Dry contact, RS485	RS232, USB, Smart slot
Noise (full load)	46/53/53dBA (40/45/45dBA @75% load)	45/50/60dBA
Operation temp.	0-50°C (40-50°C @80% derating)	0-40°C
Dimension (mm)	1k: 440x335x89, 2k: 440x432x89 3k: 440x610x89	1k: 440x335x89, 2k: 440x432x89 3k: 440x610x89
Battery connector	2-pin connector	Anderson connector

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新舊RT 5-10kVA差異說明

	New RT 5-10kVA	RT 5-10kVA
Power rating (kVA)	5/6/10	5/7/11
Power rating (kW)	5/6/10	4.5/5.6/8.8
O/P PF	Unity	0.8~0.9
Efficiency (AC-AC)	Up to 94%	Up to 92%
Efficiency (ECO)	Up to 98.5%	Up to 96%
Battery voltage	144 (derating to 70%), 192-264Vdc	5/7k: 192Vdc, 11k: 240Vdc
Charging current	Up to 8A (8A@192Vdc, 6A@240Vdc)	4A, up to 8A with optional charger
Display	Graphic LCD	LCD
Communication	RS232, USB, Mini slot, REPO/ROO, Dry contact, RS485	RS232, USB, Smart slot, Mini slot, REPO/ROO
Noise (full load)	48/48/52 (w/ fan speed control)	56/58/58
Operation temp.	0-55°C (40-55°C @75% derating)	0-40°C
Dimension (Height)	2U	5/7k: 2U, 11k: 3U
Parallel	Up to 4	Up to 2
Common battery	**No**	Yes

New RT 1-3kVA系列特點

Availability & Flexibility

- True online double conversion & zero transfer time
- Wide input voltage range
- Cold-start & AC-start
- Load segment control
- Hot swappable batteries
- Scalable runtime

Manageability

- Graphical LCD display
- Intelligent battery management
- 2-stage & 3-stage charging mechanism
- Rack/tower configuration
- Communication ports
- UPS management software

Efficiency & Reliability

- O/P PF = 0.9
- AC-AC efficiency up to 92% and up to 98% in ECO mode
- Fan speed control and failure detection
- Fan life prediction

New RT 5-10kVA系列特點

Availability & Flexibility

- True online double conversion & zero transfer time
- Wide input voltage range
- Cold-start & AC-start
- Load segment control
- Hot swappable batteries
- Scalable runtime
- Parallel up to 4 units

Manageability

- Graphical LCD display
- Intelligent battery management
- 2-stage & 3-stage charging mechanism
- Rack/tower configuration
- Communication ports
- UPS management software

Efficiency & Reliability

- Unity O/P PF
- AC-AC efficiency up to 94% and up to 98.5% in ECO mode
- Fan speed control and failure detection
- Fan life prediction
- Battery aging detection

New RT 15/20kVA系列特點

Availability & Flexibility

- True online double conversion & zero transfer time
- Wide input voltage range
- Cold-start & AC-start
- Hot swappable batteries
- Flexible Battery Quantity
- Scalable runtime
- Parallel up to 4 units
- Common battery

Manageability

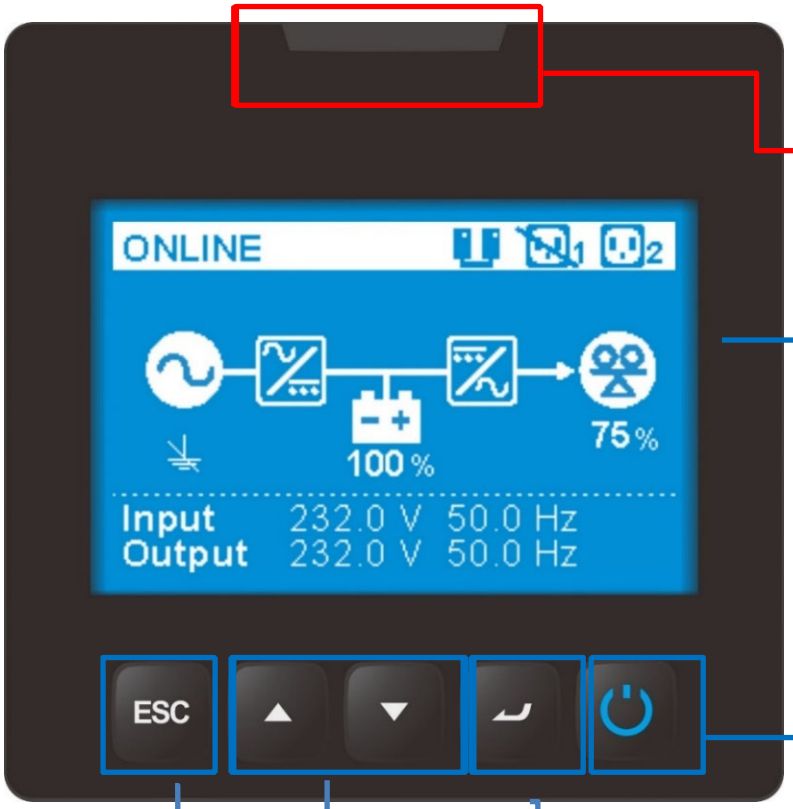
- Graphical LCD display
- Intelligent battery management
- 2-stage & 3-stage charging mechanism
- Rack/tower configuration
- Communication ports
- UPS management software

Efficiency & Reliability

- Unity O/P PF
- AC-AC efficiency up to 95.5% and up to 99% in ECO model
- Power Distribution Box + Manual Bypass Breaker
- Fan speed control and failure detection
- Fan life prediction

RoHS compliant

圖形液晶顯示器



LED Indicator

The flat LED indicator on the top of the panel will turn red when error occurs.

Graphic LCD Panel

To display various operating status and relevant monitoring data.

Power Bottom

The Power bottom stays blue when the UPS is under normal operation supplying power.

Escape/ Return

Selection

Enter

簡易機架或立式配置

- Rotatable display panel

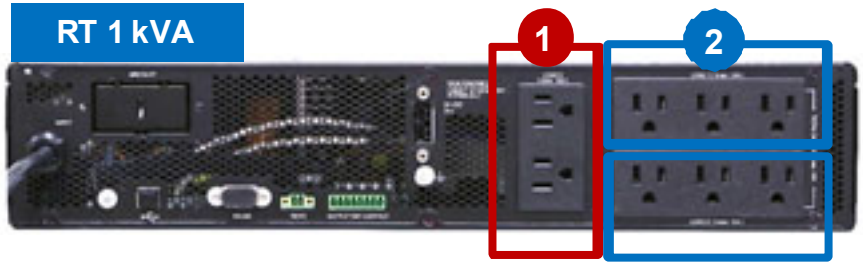
- Easy installation to tower configuration or in rack cabinets

- 2U compact design

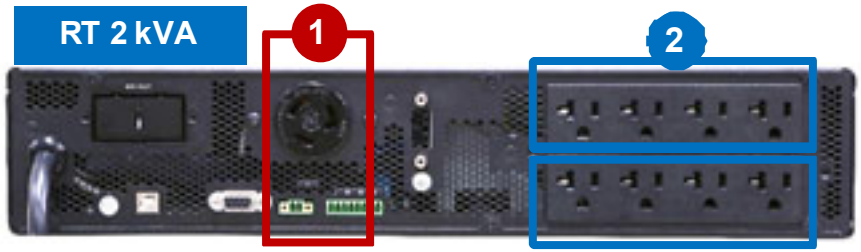
New RT 1-3kVA負載分段控制

- The output sockets can be programmed to do load segment control.

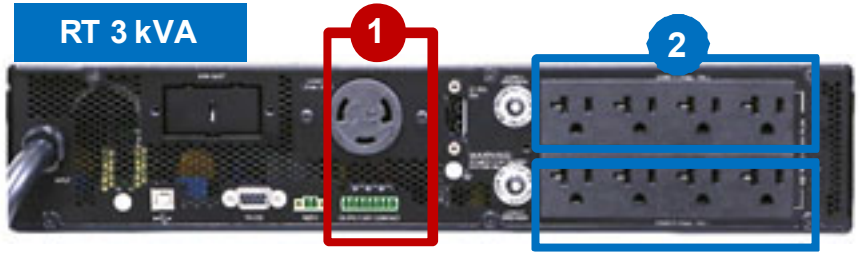
RT 1 kVA



RT 2 kVA



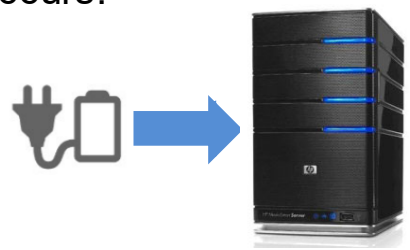
RT 3 kVA



編號	圖示	說明	
1	1_1 2_2	表示已連接負載的輸出狀態，有輸出時，負載的圖示會亮起，如果沒有輸出，則負載的圖示將以反斜線亮起。	負載 1 和負載 2 有輸出。
	1_1 2_2		負載 1 有輸出，但負載 2 沒有輸出。
	1_1 2_2		負載 1 沒有輸出，但負載 2 有輸出。
	1_1 2_2		負載 1 或負載 2 沒有輸出。

1 Main output sockets

- To connect to critical loads
- Power supply continues from battery when blackout occurs.



Critical loads

2 Programmable Load Segment Control

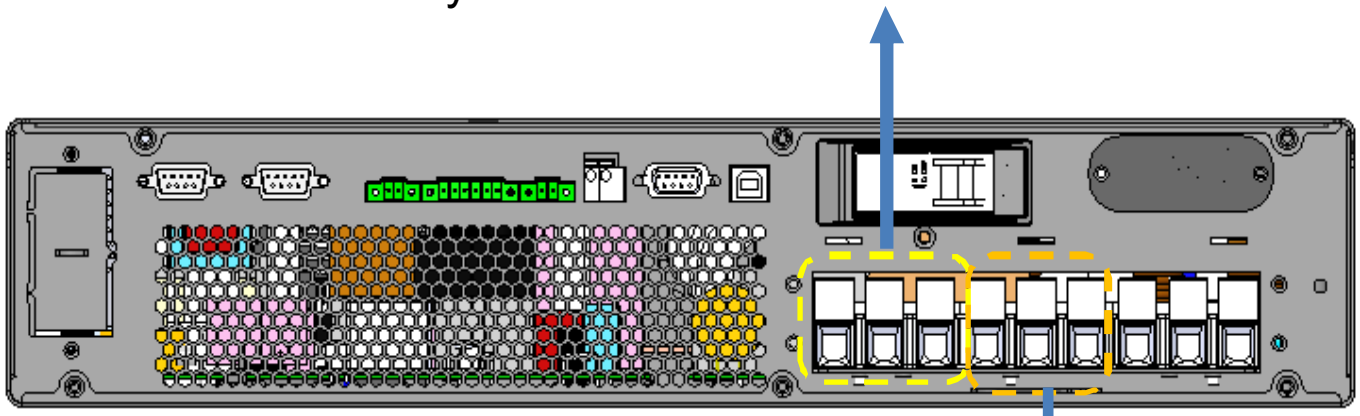
- 2 sets of programmable load segment
- To carry non-critical loads
- It is disconnected during blackout to reserve battery runtime for critical loads

New RT 5-10kVA負載分段控制

- The output sockets can be programmed to do load segment control.

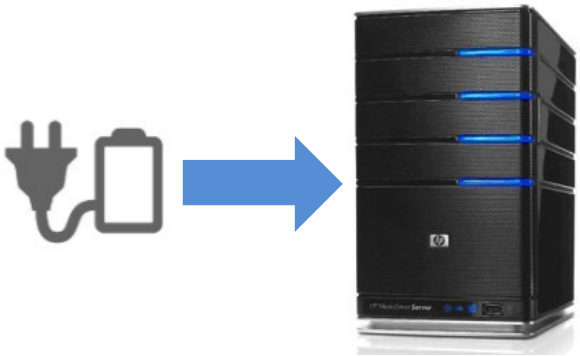
Programmable Load Segment Control

- It is disconnected during blackout to reserve battery runtime for critical loads



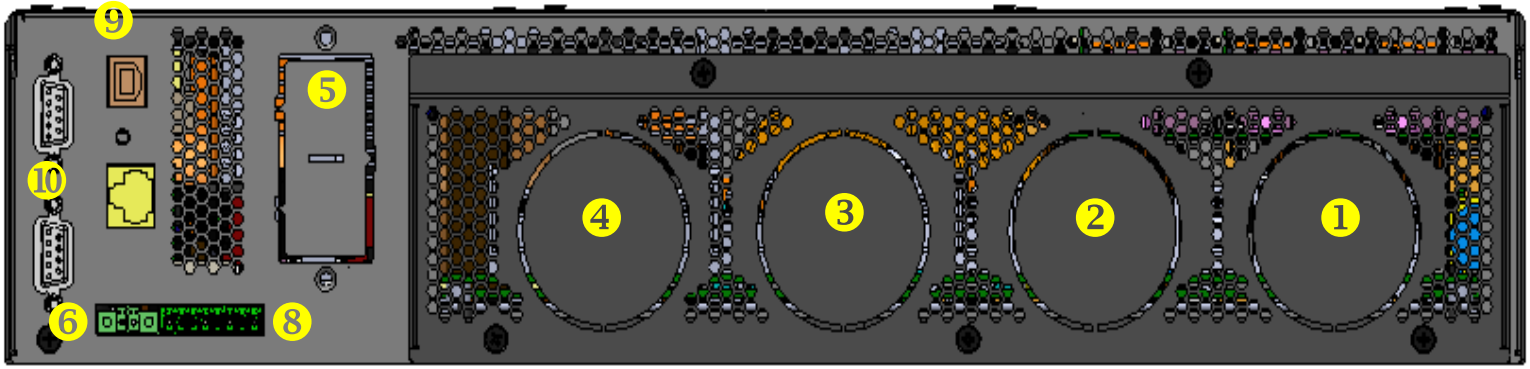
Main output sockets

- To connect to critical loads
- If the load segment control is activated, the power supply continues when a blackout occurs



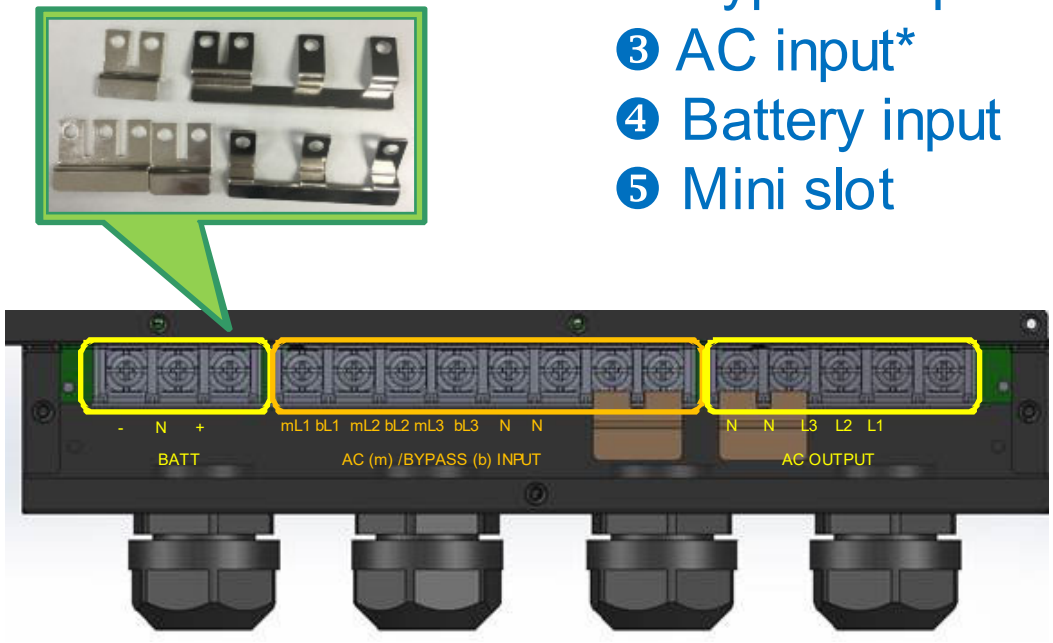
Critical loads

RT 15/20kVA多樣化輸出配置



RT 15/20 kVA

❶ AC output*
❷ Bypass input*
❸ AC input*
❹ Battery input
❺ Mini slot
❻ ROO/REPO
❽ Dry contact
❾ USB
❿ Parallel port



		3-P 15kVA	3-P 20kVA
3:1	One mains input	O	O
	Two mains input	O	O
3:3	One mains input	O	O
	Two mains input	O	O

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New RT 1-3kVA熱插拔電池組

1. Hot swappable battery

For continuous operation even when batteries are being replaced

2. Front access for battery replacement

3. Battery string design with plastic case

To eliminate electrolyte leakage

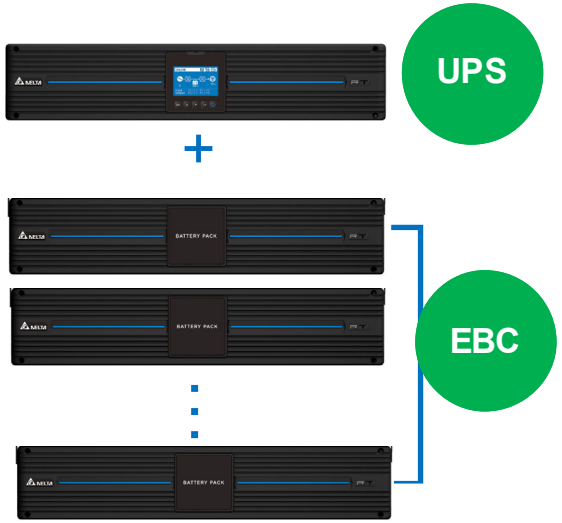
4. Plug-and-play external battery pack connector

for easy and fast connect external battery pack.

New RT 1-3kVA可擴充性的電池組

- External Battery Cabinet (EBC) for easy scaling of longer backup time.
- Standard configuration with easy cable connection & consistency in the outlook.

	1kVA	2kVA	3kVA
Internal charging current	1A		
Inbuilt Battery	9Ahx2	9Ahx4	9Ahx6
Runtime (75% load)	6.5mins	6.5mins	6.5mins
Runtime (Full load)	4mins	4mins	4mins
Battery Cabinet	2U (2x2x9Ah)	2U (2x4x9Ah)	2U (2x6x9Ah)



New RT 5-20kVA熱插拔電池組

1. Hot swappable battery

For continuous operation even when batteries are being replaced

2. Front access for battery replacement

3. Battery string design with plastic case

To eliminate electrolyte leakage

4. Plug-and-play external battery pack connector

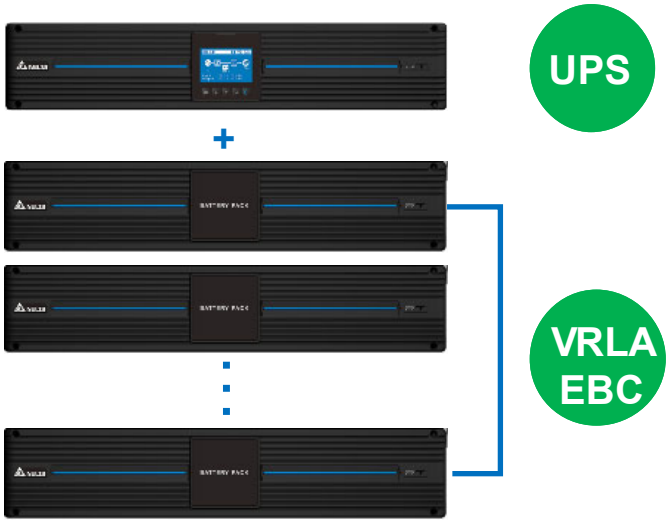
for easy and fast connect external battery pack.

5. Same EBC levered for RT 5-20kVA series for easy stock management

New RT 5-10kVA可擴充性的電池組

- Standard External Battery Cabinet (EBC) for easy scaling of longer backup time.

	5kVA	6kVA	10kVA
External Battery Cabinet	**2U (1 x 7Ah x 16 pcs) or 3U (1 x 9Ah x 20pcs)**		
Battery voltage	144*, 192-264Vdc (default: 192Vdc)		144*, 192-264Vdc (default: 240Vdc)
Charge Current	Up to 8A		



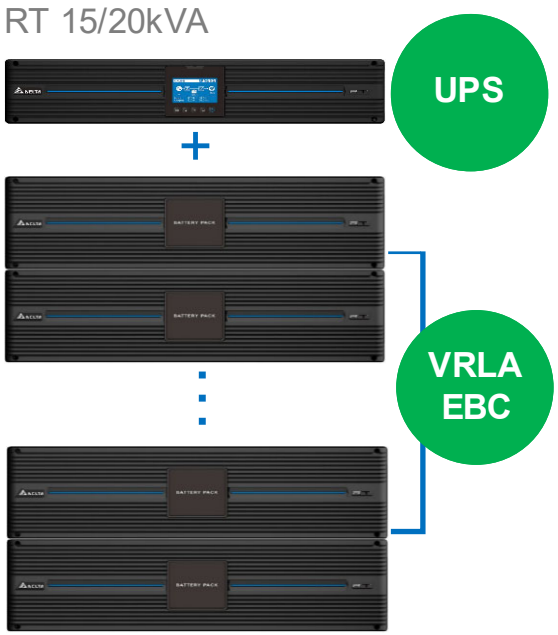
New RT 15/20kVA可擴充性的電池組

- Standard External Battery Cabinet (EBC) for easy scaling of longer backup time.

		15kVA	20kVA
Battery Cabinet		**6U (2 x 7.5Ah x 20 pcs)**	
Charge Current		Up to 8A	
Recharge Time		3 hours to 90% (UPS w/ 1 set of EBC)	
Runtime (1 set of EBC)	75% Load	9 min.	5.5 min.
	Full Load	5.5 min.	3.5 min.
Runtime: 5 minutes	75% Load	+ 1 Set	+ 1 Set
	Full Load	+ 1 Set	+ 2 Sets
Runtime: 10 minutes	75% Load	+ 2 Sets	+ 2 Sets
	Full Load	+ 2 Sets	+ 2 Sets
Runtime: 15 minutes	75% Load	+ 2 Sets	+ 3 Sets
	Full Load	+ 3 Sets	+ 3 Sets

Batt. source: Yuasa REW45-12FR

RT 15/20kVA



智慧的電池管理模式

Maximizes battery performance and sustains battery life.

Reduce battery recharge time

- 2-stage charging or 3-stage superior charging
- With internal battery: 3hrs recharge to 90%
- Charger capacity: 1A

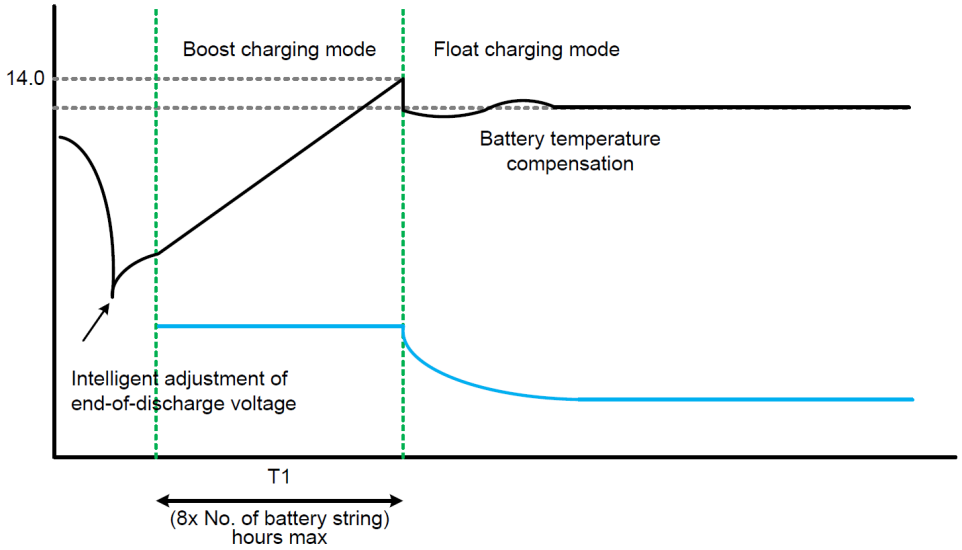
Extend battery life

- Intermission stage of 3-stage superior charging mechanism
- Over charge protection
- Automatic cut-off voltage adjustment basing on load or discharge time to avoid over discharge
- Battery temperature compensation
- Runtime limitation setting

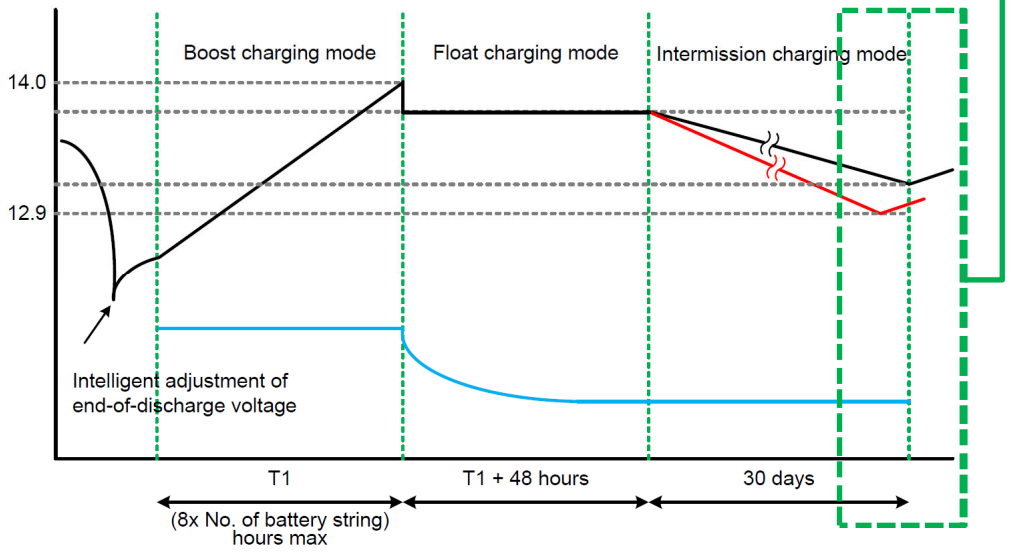
Compatibility with the SMF/ VRLA/GEL/ Ni-Cd/ LATB battery

The charger will re-turn on when:
1. Self-discharge after 30 days
2. Battery voltage @12.9V

2-stage charging mechanism



3-stage superior charging mechanism



Float charge dries up the electrolyte and corrodes the plates, reducing batt. potential life. To solve the challenge, we implement “intermission” stage to turn off the charger temporarily.

電池健康狀態偵測

On-site Battery Test

To immediately test battery health via LCD control panel for knowing battery conditions, and to detect battery missing every minute.

Automatic battery test

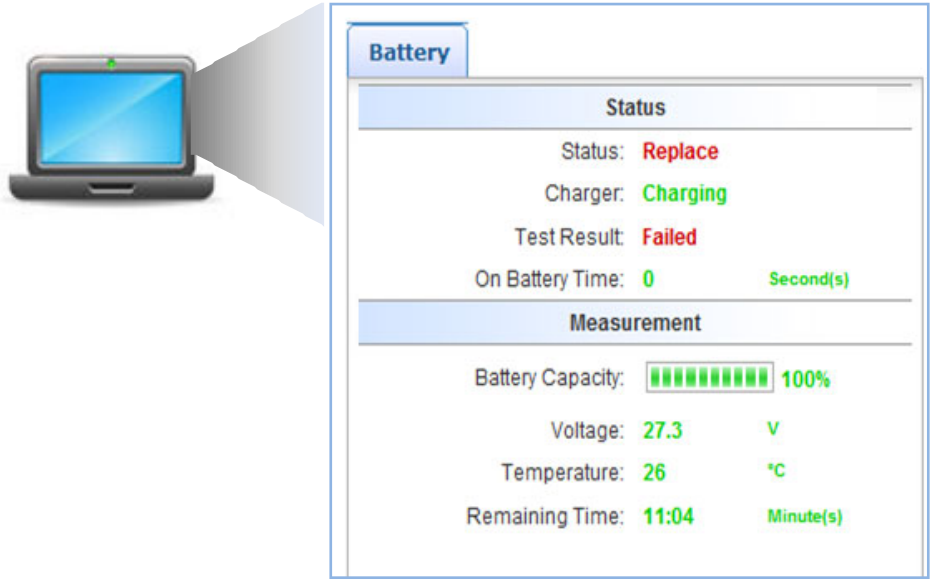
- Auto and cyclic battery missing detection
- The 10-sec test to check whether the battery runs well, available with weekly, monthly or bi-monthly interval

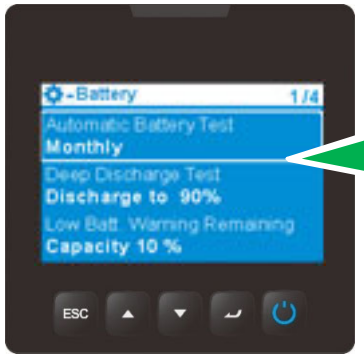
Remote Battery Test

To set up regular or immediate battery deep discharge test via UPSentry software to check battery health.

Deep discharge test

Automatic battery test + Battery activation through battery deep discharging and recharging. Battery capability setting from 90% (default) to 20% (available for on-site test only)





Simple setup via the graphic panel

The user will receive warning or notice based on the setting before the battery malfunctions and fails.

風扇故障偵測及轉速控制

- Risk management via fan failure detection which alerts users to failed fans
- Multi-stage fan speed control determined by work mode and loads to maximize efficiency and reduce audible noise

Fan failure detection

The UPS sends out alarms when it senses the fan stopping. This design provides early warning for customers to protect UPS from overheating to breakdown.

	1kVA	2kVA	3kVA
@ 75% load	< 40 dB	< 45 dB	
ECO mode	< 22 dB	< 45 dB	

* Typical environment temp.: ≤30℃

Fan speed control and low audible noise

The UPS automatically adjusts the fan speed based on the load or the work mode. It leads to lower audible noise which is friendly to applications close to users.

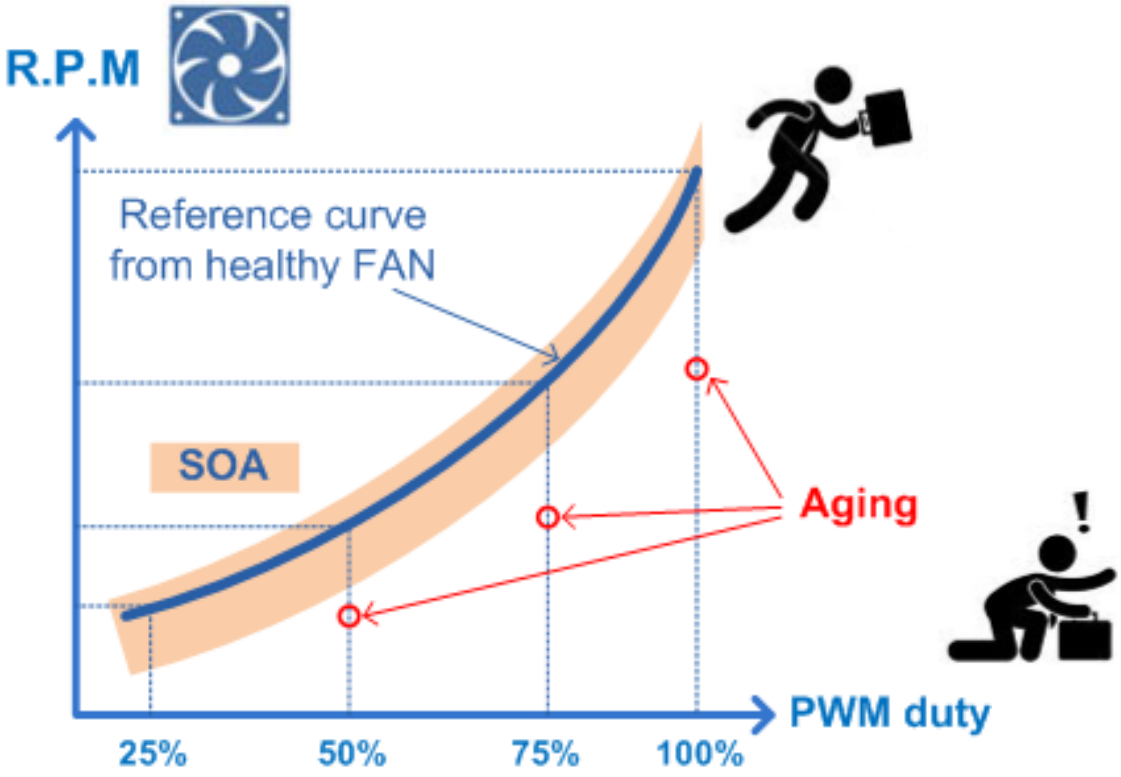
RT series	5-6kVA	8-10kVA
@ 75% load*	47 dB	48 dB
ECO mode	47 dB	48 dB

	15kVA	20kVA
@ 75% load*	54 dB	
ECO mode	48 dB	

* Typical environment temp.: ≤32℃

風扇壽命預測

- The Component Life Prediction is to monitor the operating conditions of different components, and send out alerts before failure happens to avoid downtime.



RPM: Rotation per minute
SOA: Safe operating area
PWM: Pulse Width Modulation

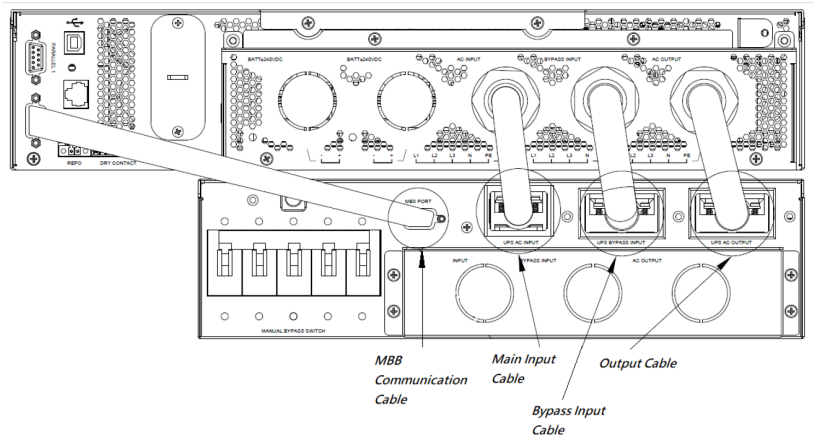
Taking the fan as an example:

- The fan rotational speed is defined in a range under specific load and ambient temperature.
- The rotational speed is monitored. When it is slower and beyond the defined tolerance, the fan is under the risk of failing so the UPS will send out warning.

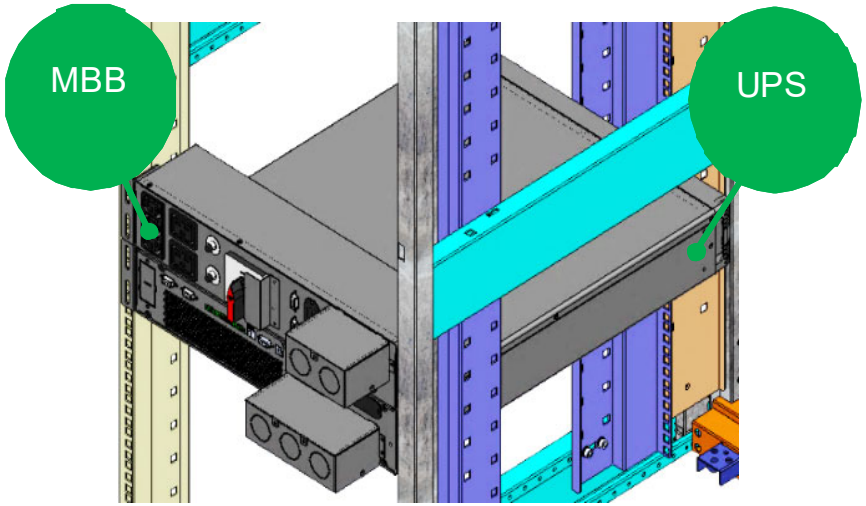
Maintenance Bypass Breaker Box

- MBB is available in single and parallel configurations to Extended Runtime models to enable continuous power during test, maintenance, service, or upgrade.

Single Config.



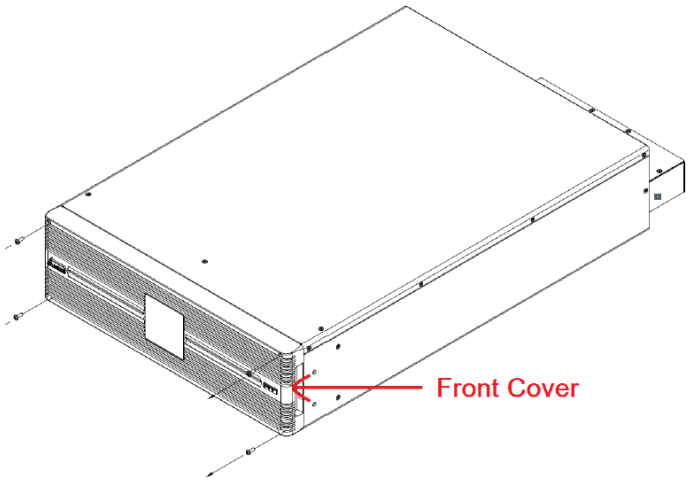
Compact MBB for different application scenarios



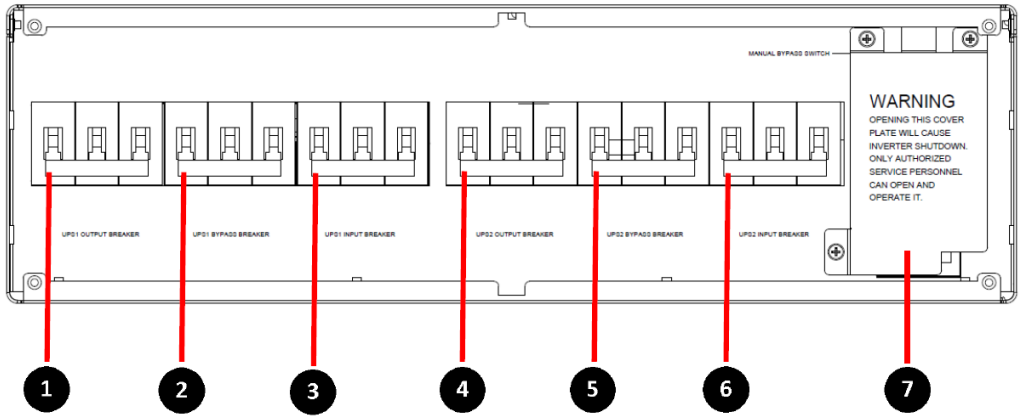
Rack-mount Configuration

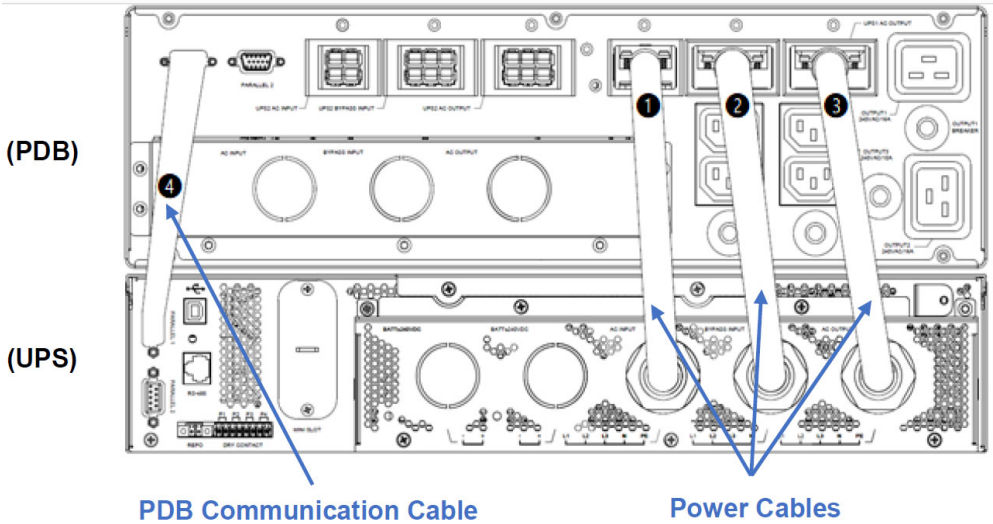
The MBB is installed on the UPS, fixed by the ear brackets in the rack.

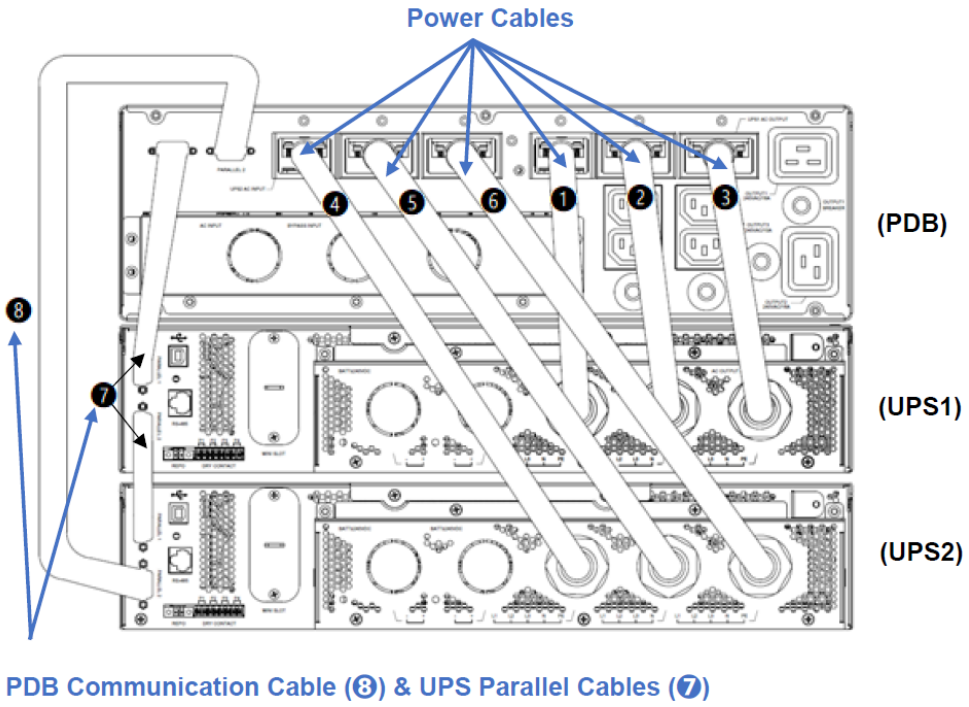
Power Distribution Box



(Figure 4-2: PDB's Front Cover)



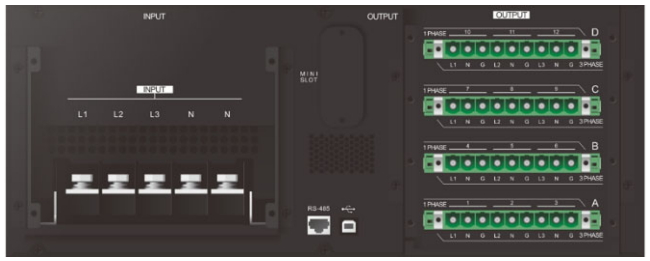




15k/20k Rack Remote Power Panel

- The Rack Remote Power Panel (rRPP) is to help users who need output power distribution and power monitoring functions.
- Ideal for server closet or small-mid datacenters, the rRPP can be perfectly integrated with standard server racks and results in saving valuable datacenter space.

rRPP front view



rRPP rear view

Input: 3 phase 380/400/415V or 3 phase 208/220V
Output: 12 x 1-phase terminals or 4 x 3 phase terminals

CE Breaker module: 1 phase(230V) 16A or 32A, 3 phase(400V) 16A or 32A
UL Breaker module: 1 phase(120V) 20A or 30A, 3 phase(208V) 20A or 30A

Communication: USB, RS232, RS485, Modbus, SNMP iPV6 (option)
Safety: CE, UL

Main Features

- ✓ Support up to 40kW
- ✓ 4 hot-swappable breaker modules(optional), that is, rRPP can connect 12 branches max.
- ✓ 1-P & 3-P output power distribution
- ✓ Hot-swappable branch breaker modules
- ✓ Branch parameter detection
- ✓ USB port, RS-485 port and Mini slot for optional card to fulfill monitoring demand

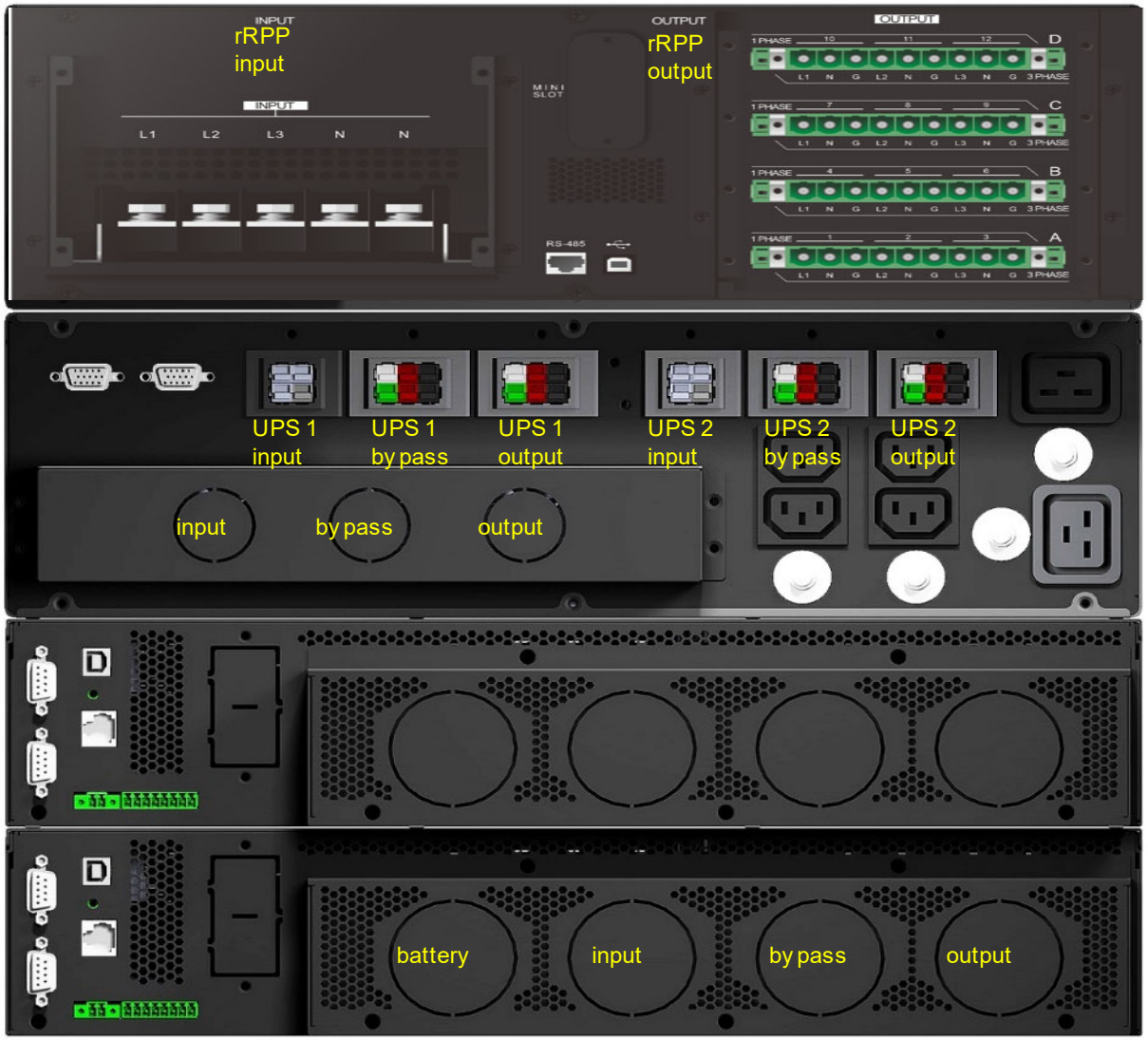
rRPP+PDB+UPS1+UPS2

RT 15-20kVA rRPP
(3U)

RT 15-20kVA PDB
(3U)

RT 20kVA UPS 2
(2U)

RT 20kVA UPS 1
(2U)



HPH G2 20-40K Overview

#1 UPS Performance

World 1st in <40kVA power range

Less footprint (40kW / 0.15m^2)

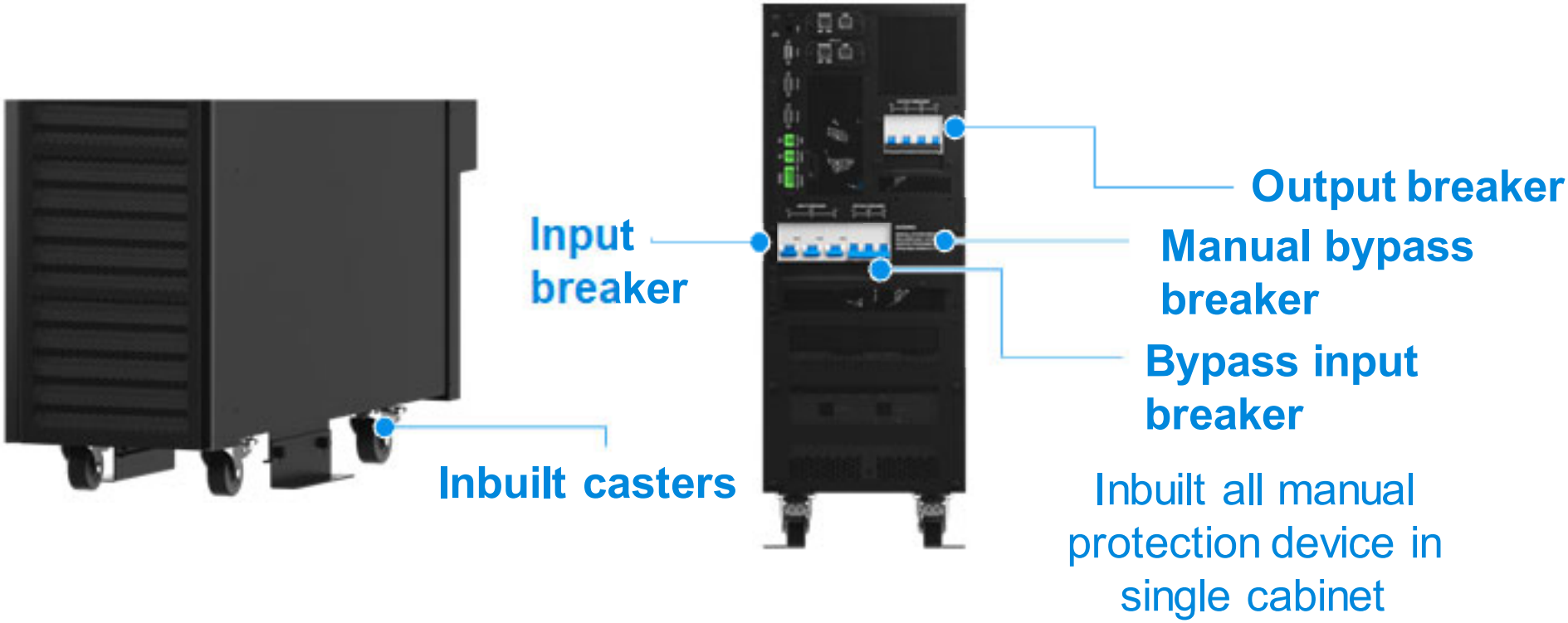
Less footprint to reduce the space wasting

Topology	On-line double conversion Three Phase In, Three Phase Out
Power Rating	20 kVA / 20 kW 30 kVA / 30 kW 40 kVA/40 kW
Voltage	220/380V, 230/400V, 240/415V (3-phase, 4-wire + G)
AC-AC Efficiency	Peak efficiency > 96%
Parallel & Redundancy	Up to 4 units
Battery Q'ty	30~46pcs configurable (Default: 40pcs)
Inbuilt Charger Current	Maximum 15A
Dimension (W*D*H in mm)	240 x 630 x 650 mm
Compliance	CE, RCM, BSMI

HPH G2 20-40K

Delta Confidential

容易佈署及維護



- ✓ Inbuilt casters for easy move-in, positioning and maintenance
- ✓ Inbuilt input / bypass input / output / maintenance bypass breakers for completed distribution panel

超低輸入諧波電流及輸出諧波電壓

iTHD < 2%

- Optimal generator size can be chosen
- Initial investment cost and installation cost can be reduced

Optimized generator size

iTHD

Lowest pollution (iTHD < 2%) to upstream power

vTHD < 1.5% (on linear load)

- Better power quality
- Less heat to prevent low performance and short life of load

vTHD

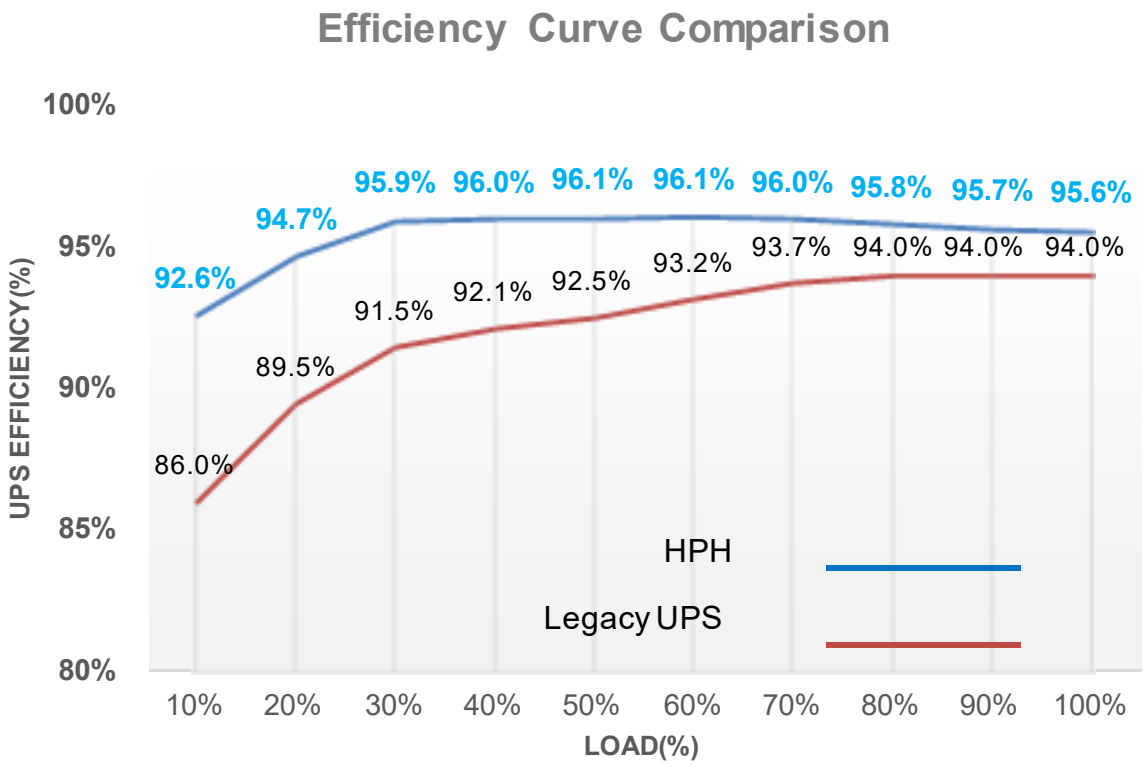
Lower vTHD for better power quality

Compute Loads

Industrial Loads

Networking Loads

高效運轉



Efficiency	Energy Cost		
	1st Year	3rd Year	5th Year
96.00%	58,400	175,200	292,000
92.10%	60,873	182,619	304,365
Energy Cost Saving	-2,473	-7,419	-12,365

Assumption:

- *40kVA UPS, 40% load (16kW)*
- *Considering 1+1 redundancy*
- *Energy cost: $0.2 per kW.h*

Save almost 2 UPS price after daily operation in 2nd year!!

靈活的電池配置

優化電池配置和總體擁有成本

可調整的充電電流

- 提供高達15A 的可調充電電流

多選擇性的電池總類

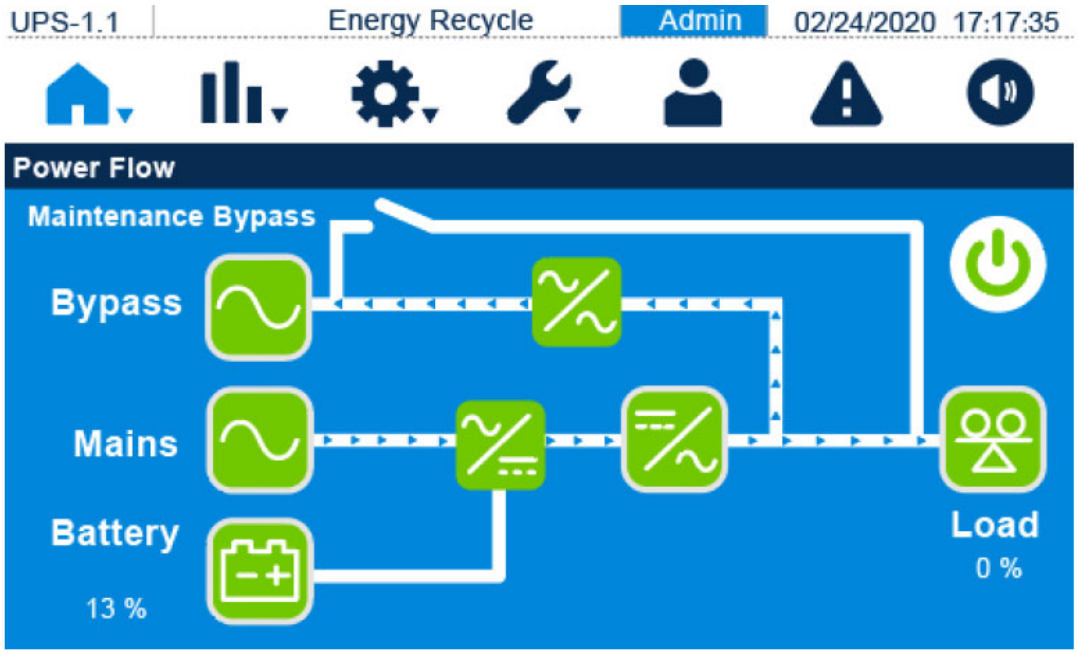
- 兼容鋰離子/ SMF / 鉛酸 /管狀/鎳鎘等種類電池。
- 浮充和均充電壓可通過觸控螢幕設定調節。

靈活的電池數量配置和電壓

- 可調節的電池數量（30～46pcs）和充電電壓範圍（204V～312V），以通過不同的備用時間要求來優化能源成本。

無負載軟體自我測試

Support the commission test without load bank.



Benefit:

Safe test and help customer to save the rental of traditional load back up to ***$ 892*** *for 40kW commissioning test*

40kW UPS test cost comparison

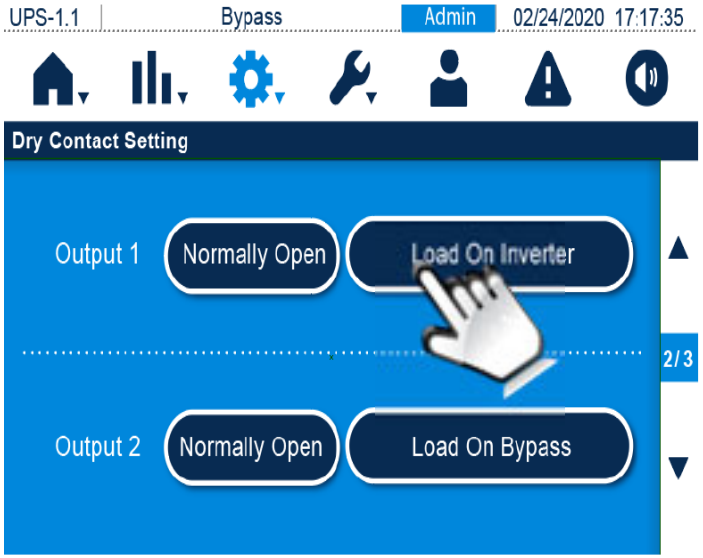
Operation	Traditional Test	Energy recycle mode
Cable connection to load bank	8 hours	0 hour
Burn-in Test	24 hours	24 hours
Load Bank Rental (2 days)	$ 600	$0
Electrician expense for cable connection to the load	$100/hour	$0
Energy Waste	$ 200	$8
Total Cost	$ 900	$8

Assumption:

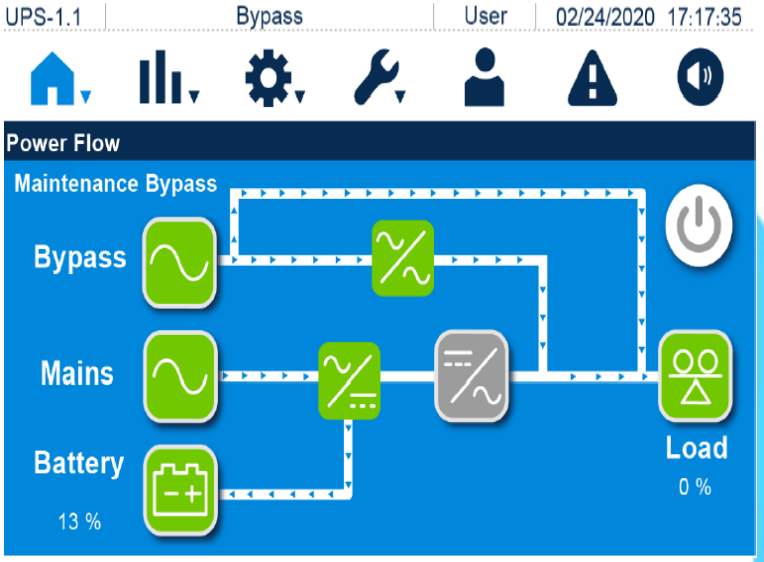
1. *Considering AC/AC UPS efficiency of 96%, utility cost is $0.2 per kW.h*
2. *Considering the average rental cost per day of load back is $300*

5” 彩色觸控螢幕

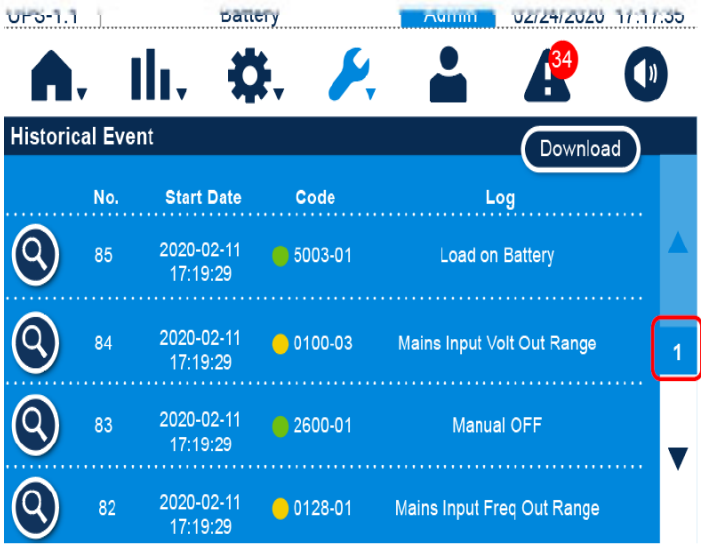
Configuration by a simple click!



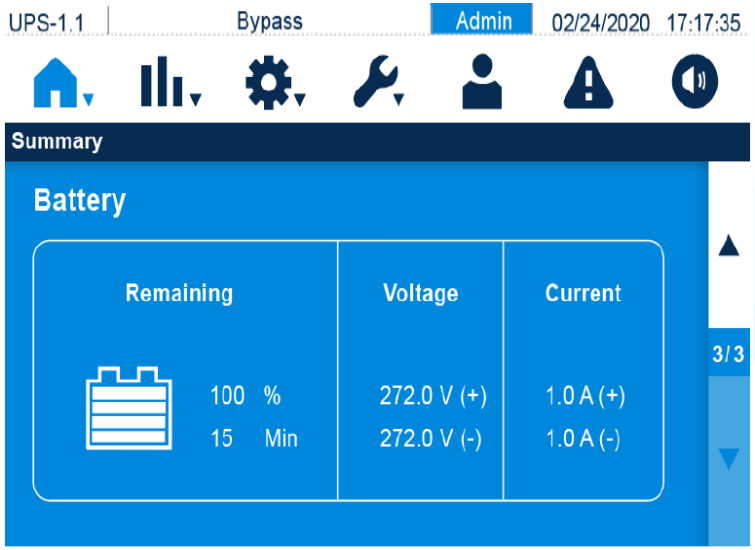
Easily monitor UPS at a glance



Event log tracking for easy maintenance

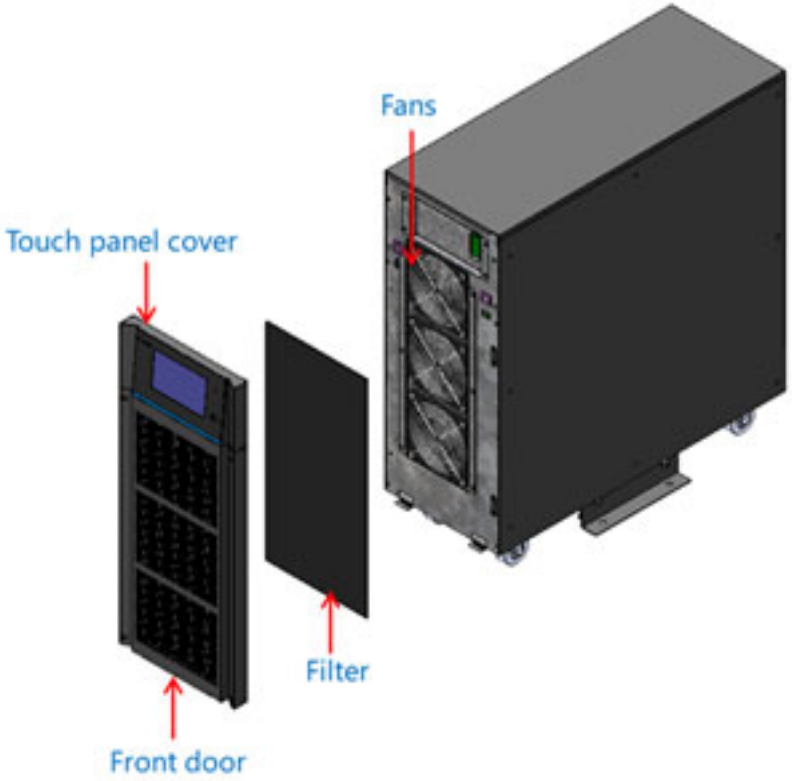


Clear summary of UPS and battery

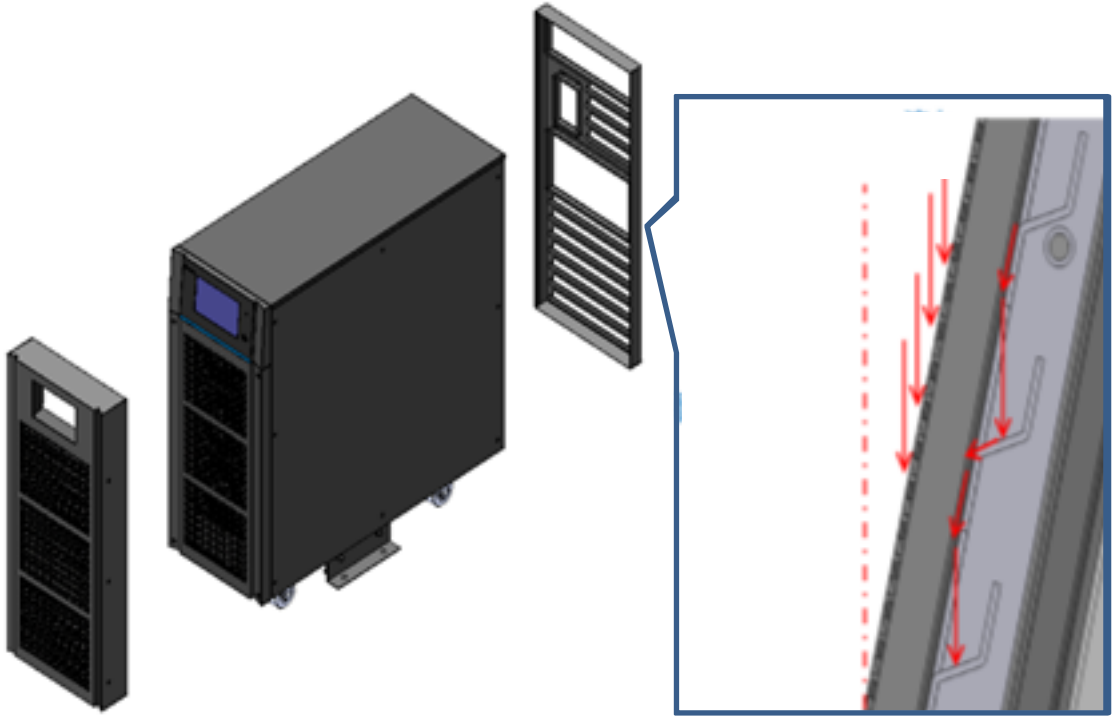


支援輕工業環境應用

Support IP40 by Optional filter



Support IPX2 by Optional front bezel & rear cover

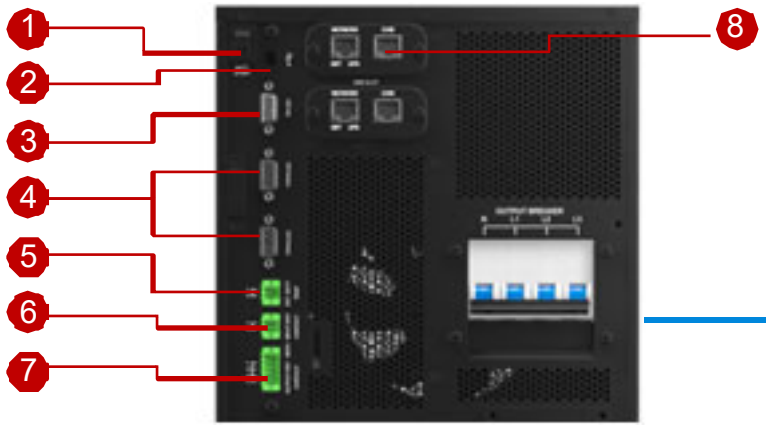


** UPS load need to be de-rated for IP4X: 70% load@40℃; 80% load@30℃.*

IPXX

可抵擋直徑大於
2.5mm 的固體入侵
>2.5mm
>12.5mm
可抵擋直徑大於
12.5mm 的固體入侵
可抵擋直徑大於
1mm 的固體入侵
>1mm
>50mm
可抵擋直徑大於
50mm 的固體入侵
灰塵有限度進入
防止灰塵堆積
防塵
等級
沒有保護
防止灰塵進入
完全防塵效果
能夠超過 1 米水深
長期浸泡，實際使用時間
視乎製造商而定
1M
80cm
60cm
40cm
20cm
spill 百科
IP68
Ingress
Protection
國際公認
防護等級
認證
#spill.hk
能夠處於 1 米水深
長達 30 分鐘
沒有保護
防水
等級
防重力噴射保護
至少維持 3 分鐘
防低壓水柱噴射保護
至少維持 3 分鐘
防垂直滴水保護
長達 10 分鐘
防傾斜 15° 滴水保護
長達 10 分鐘
防濺水保護
長達 5 分鐘
防噴灑保護
長達 5 分鐘

通訊介面



1. **Battery Start**
   Turn on UPS by battery mode
2. **USB port**
   Connect to the computer
3. **RS-232 port**
   Connect to the computer
4. **Parallel port**
   For UPS parallel usage
5. **External battery temp. contacts**
   For external battery temp. compensation
6. **Input dry contacts**
7. **REPO & Output dry contacts**
8. **Mini slots**
   For optional communication cards

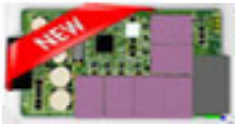
Mini SNMP IPv6 Card

Monitors and controls the status of the UPS via a network system and also log management.

* The Mini SNMP version adds the security protocols to response requirements, and it is the next generation of internet protocol standard with hot swappable support.

Mini ModBus Card

Provides continuous and reliable remote monitoring of a UPS system through Industrial Automation System (IAS) and Building Management System.



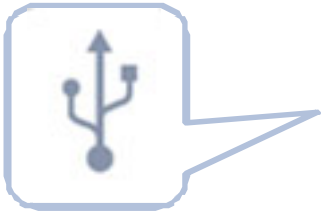
Mini Relay I/O Card

Increases the quantity of dry contacts.

- Mini SNMP IPv6 Card is covered by a card case. It is enabled via inserting to mini slot and then connecting with cable wire.
- No need to disassemble UPS's chassis, it is a plug in design.

優越的可用性

- Built-in USB port enables convenient firmware upgrade or event log download.
- Built-in SRAM records at maximum **10,000 event logs** supports maintenance analysis.
- Check event logs simply on the LCD screen for timely on-site service.
- Support event log download from SNMP interface



The USB port is located behind the front panel.

新舊HPH差異說明-外觀

HPH **Gen.2** 20-40kVA

HPH Gen.2 20-40kVA	
Dimension	240x630x650 mm
Weight	~64 kg (40kVA)
Power Density	407 kW/m^3 (40kVA)

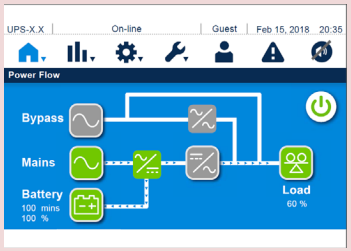
HPH Gen.1 20-40kVA

HPH Gen.1 20-40kVA	
Dimension	380x800x800 mm
Weight	86.5 kg (40kVA)
Power Density	164 kW/m^3 (40kVA)

Physical Improvement

- Weight: - 26% (Est.) ⬇
- Footprint: - 50% ⬇
- Power density: +148% ⬆

新舊HPH差異說明-規格

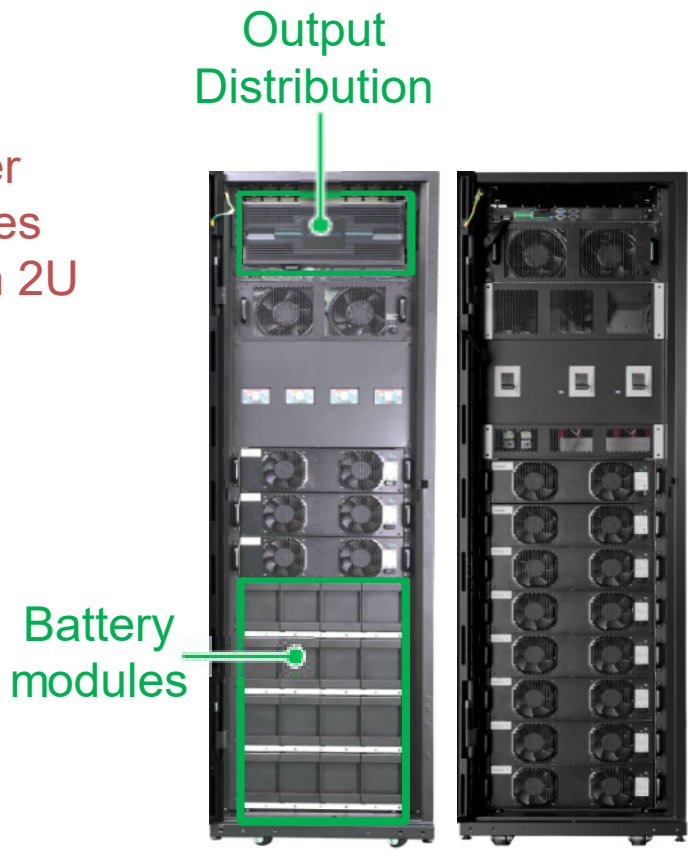
Item	HPH Gen.2 20-40kVA	HPH Gen.1 20-40kVA
Power Rating	20/30/40KVA	20/30/40KVA
Input Voltage Range (V)	304~477	304~477
Charge Current (A)	**15A**	9A
Battery Number	30~46 (30-32pcs: de-rating 20% power)	32~50
Output PF	1	1
Efficiency (Full Load)	>96%	96%
Inbuilt Breakers	Input / Bypass input / **Output** / Manual bypass	Input / Bypass input / Manual bypass
Overload	100~105%: continuous; **105~110%: 60min with no bypass transfer;** 110~125%: 10 min with no bypass transfer; 125≦150%: 1 min with no bypass transfer;	100~105%: continuous; 110~125%: 10 min with no bypass transfer; 125≦150%: 1 min with no bypass transfer;
Display	**5" touch panel:** 	**3" Graphic LCD**

DPH系列家族

80/120kVA

20kW Power Module
(2U height)

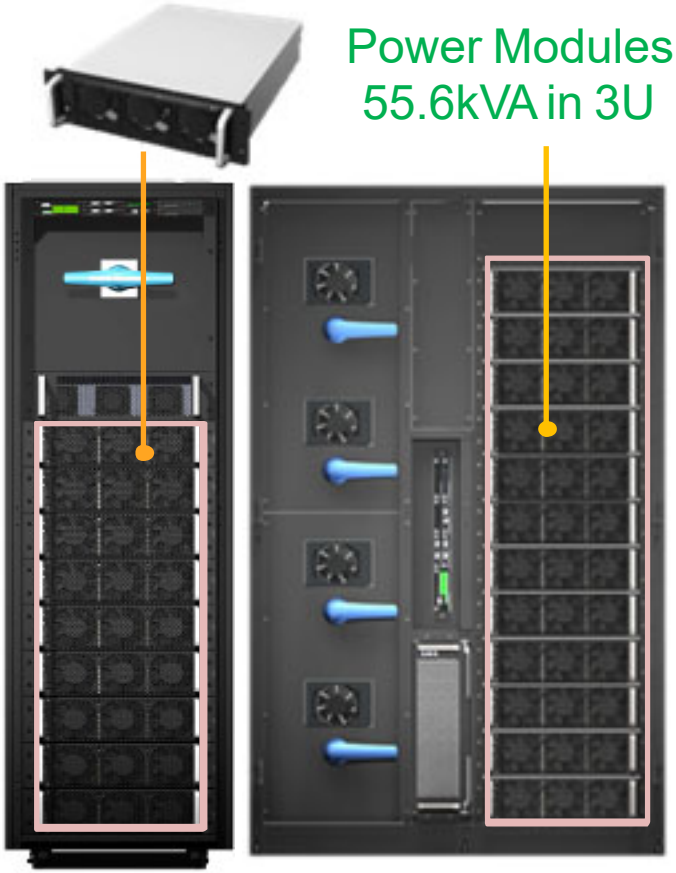
可靠且高度整合的
可管理模組式**UPS**



75/150/200kVA

25kW Power Module
(3U height)

一體化電源
解決方案



300/500/600kVA

50kW Power Module
(3U height)

在單機櫃及雙機櫃
的空間中達成最高
的功率密度

Delta Confidential

DPH 80/120kVA主要特點

- **領先業界的高功率密度：**
  - ✓ 20kW的電源模塊只占2U的高度
  - ✓ 120kW所需的開關裝置在162.8 kW / m3的功率密度的空間內
  - ✓ 提供頂部/底部電纜入口，無需額外的機櫃
- **卓越的可靠性和可用性：**
  - ✓ 雙CAN通信路由、輔助電源和可選的控制器等冗餘機制設計
  - ✓ 完全模塊化和熱插拔設計
  - ✓ 全面的正面操作和維護通道
- **高度集成的可管理性：**
  - ✓ 10吋彩色觸控螢幕，內置SNMP和Modbus接口
  - ✓ EMS/BMS可整合在螢幕上顯示
  - ✓ 功耗趨勢顯示，便於基礎設施的安排
  - ✓ 先進的事件診斷功能

規格容量

DPH 20-120kVA		
拓樸技術	On-line double conversion Three Phase In, Three Phase Out	
額定容量	20/40/60/80 kVA 20/40/60/80 kW	20/40/60/80/100/120 kVA 20/40/60/80/100/120 kW
尺寸mm (W*D*H in mm)	600*850*1445 mm (80/120 kVA System Frame)	
電壓	220/380V, 230/400V, 240/415V (3-phase, 4-wire + G)	
AC-AC 效率	Peak efficiency > 96%	
並聯機組	Up to 8 units	
電池數量	30~46pcs configurable (Default: 40pcs)	
進線方式	Support TOP/Bottom cable entry without additional accessory	
安規	CE	

DPH 80/120kVA機組配置

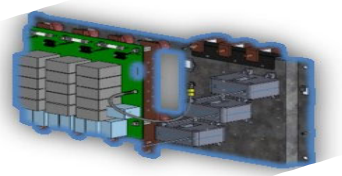
10” touch panel

1U CSU with
hot-swap controller

2U hot-swap
Power module
18kg

hot-swap
STS module

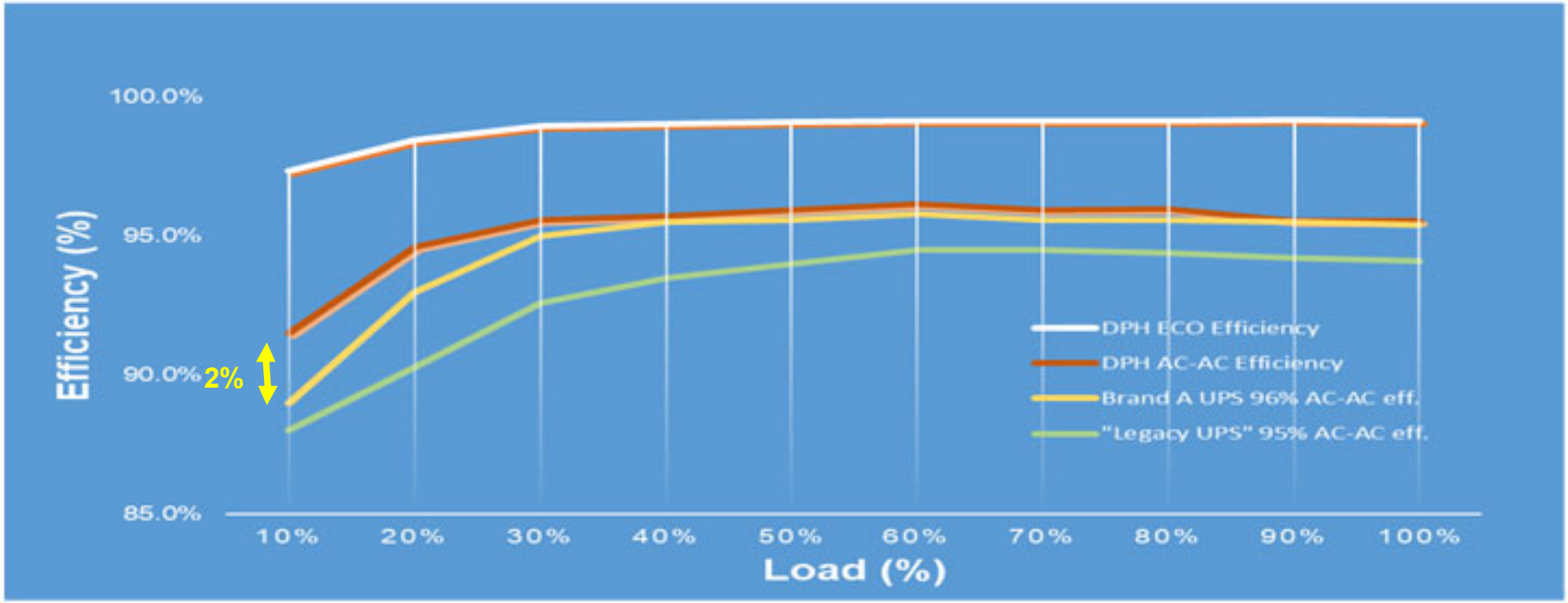
Inbuilt
Breakers



Filter & fuse
Fully front access maintenance

領先的運轉效率

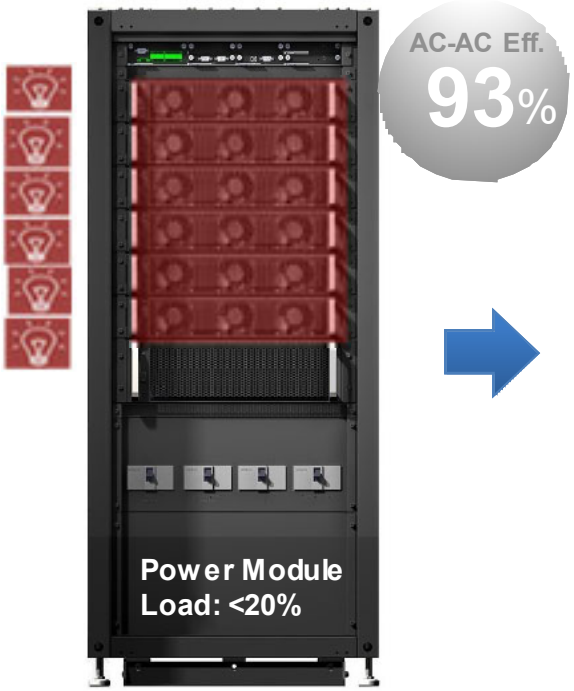
- 平整的AC-AC運轉效率曲線，有效節省能源成本.



- Online mode efficiency >94% @ 20% load; >95% @ 30% load
- Online mode Peak efficiency >96%@ 60% load
- ECO mode efficiency isn't less than 98% while UPS load >15%

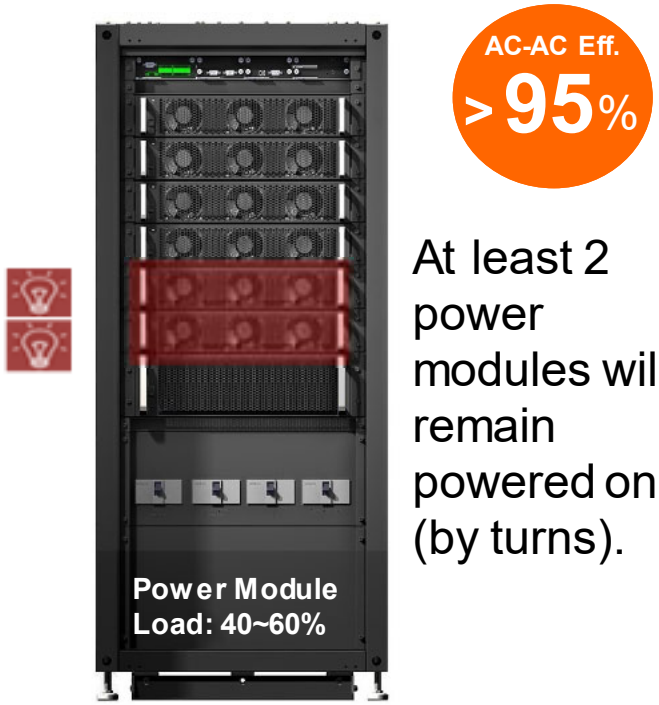
綠色節能模式

Load Sharing



Power Aggregation

PM: Load < 40%

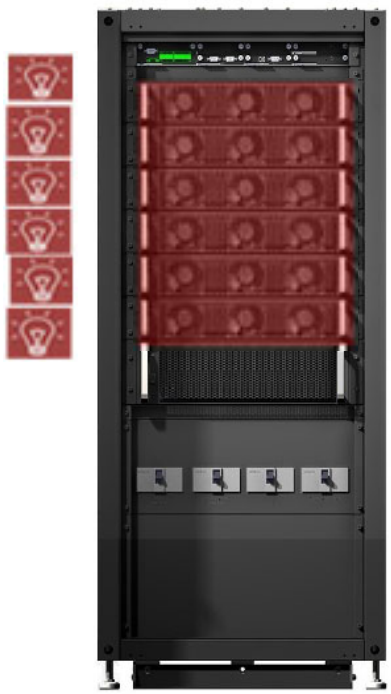


At least 2 power modules will remain powered on (by turns).

System will put one power module in standby mode every 30 seconds.

Load Sharing

PM: Load > 60%



*Transfer time from standby to online mode is less than **5ms***

靈活的電池配置

優化電池配置和總體擁有成本

可調整的充電電流

- 提供高達6-8A *的可調充電電流（每個電源模組）

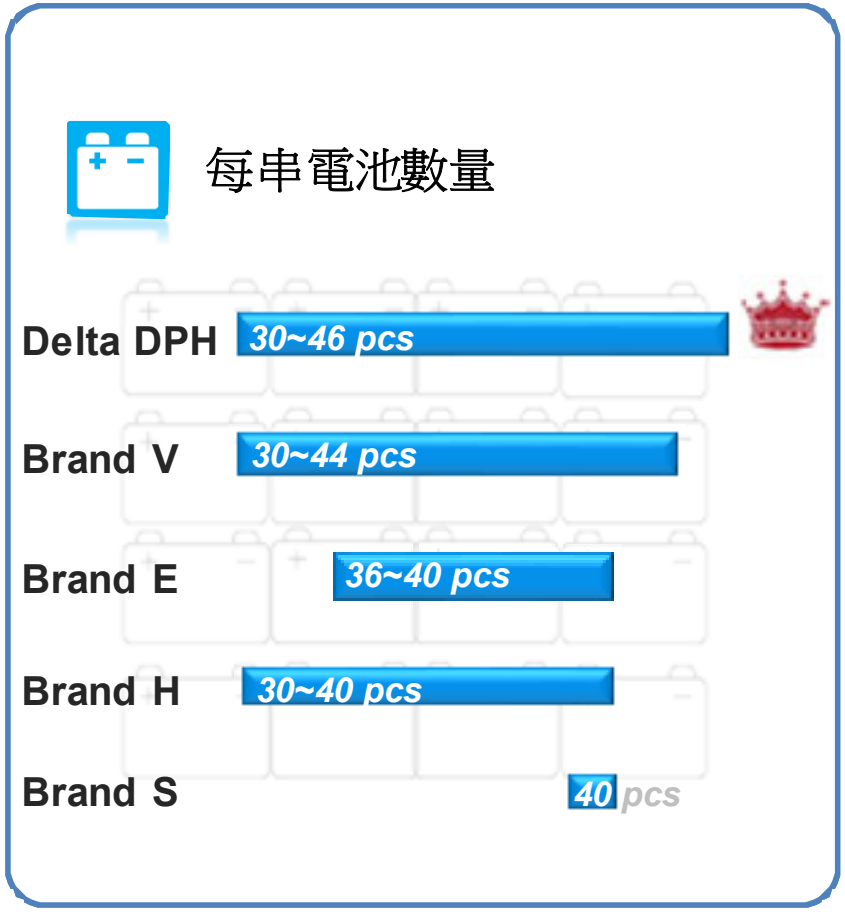
多選擇性的電池總類

- 兼容鋰離子/ SMF / 鉛酸 /管狀/鎳鎘等種類電池。
- 浮充和均充電壓可通過觸控螢幕設定調節。

靈活的電池數量配置和電壓

- 可調節的電池數量（30～46pcs）和充電電壓範圍（204V～312V），以通過不同的備用時間要求來優化能源成本。

*充電電流為8A是在有條件的情況下。
*配置34(含)只以下電池需降容30%



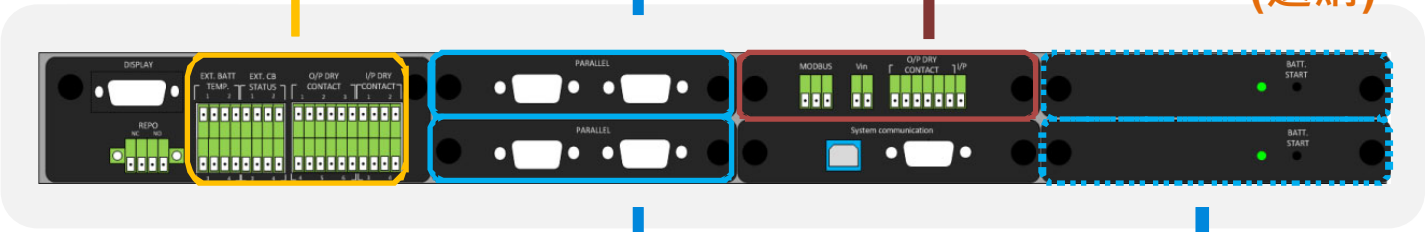
冗餘設計

可選購冗餘控制器以提高系統的可用性

控制卡 (選購)

電池溫度感知/外部開關
狀態/輸入輸出乾接點

擴充的乾接點卡或LiB BMS卡*
(選購)



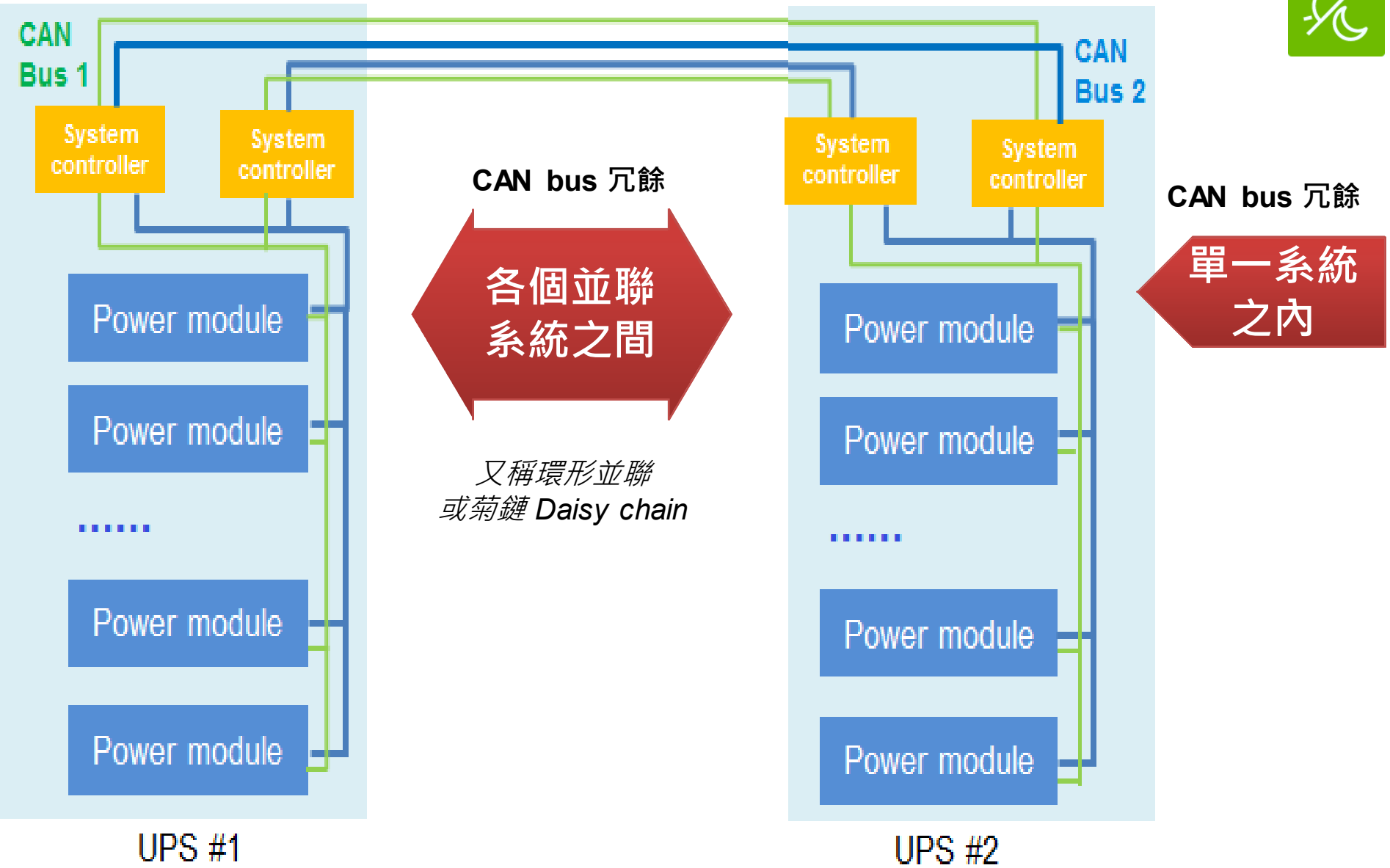
控制卡 x 1 (標配)

提供UPS系統通信共享，並聯和同步。

輔助電源 x 2

* LiB BMS卡：保留用於台達授權鋰離子電池櫃的BMS。

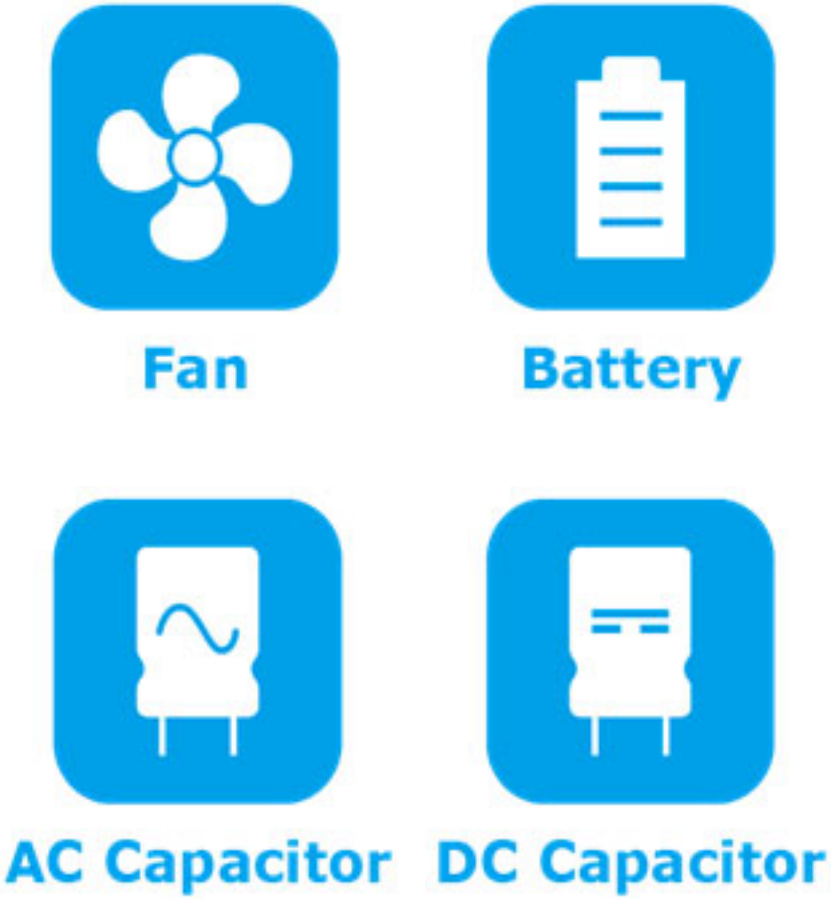
冗餘設計


CAN
Bus 1
System controller
System controller
CAN bus 冗餘
各個並聯
系統之間
又稱環形並聯
或菊鏈 Daisy chain
System controller
System controller
CAN
Bus 2
CAN bus 冗餘
單一系統
之內
Power module
Power module
.....
Power module
Power module
Power module
Power module
.....
Power module
Power module
UPS #1
UPS #2

自我偵測.提早預警

" 預防勝於治療 "

- **Preventive action** minimizes downtime risk and protect your investment.
- **Self diagnosis, evaluation** and **aging detection** can be achieved by comprehensive data collection and analysis.



***Optional**

健檢系統

DC Fan

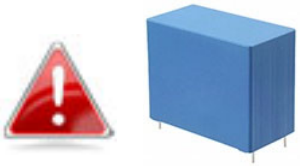
DC fan with PWM feedback signal to detect the fan speed (RPM)

AC CAP

By detecting the ripple current and system can provide the aging pre-alarm and current status for reference.

DC CAP

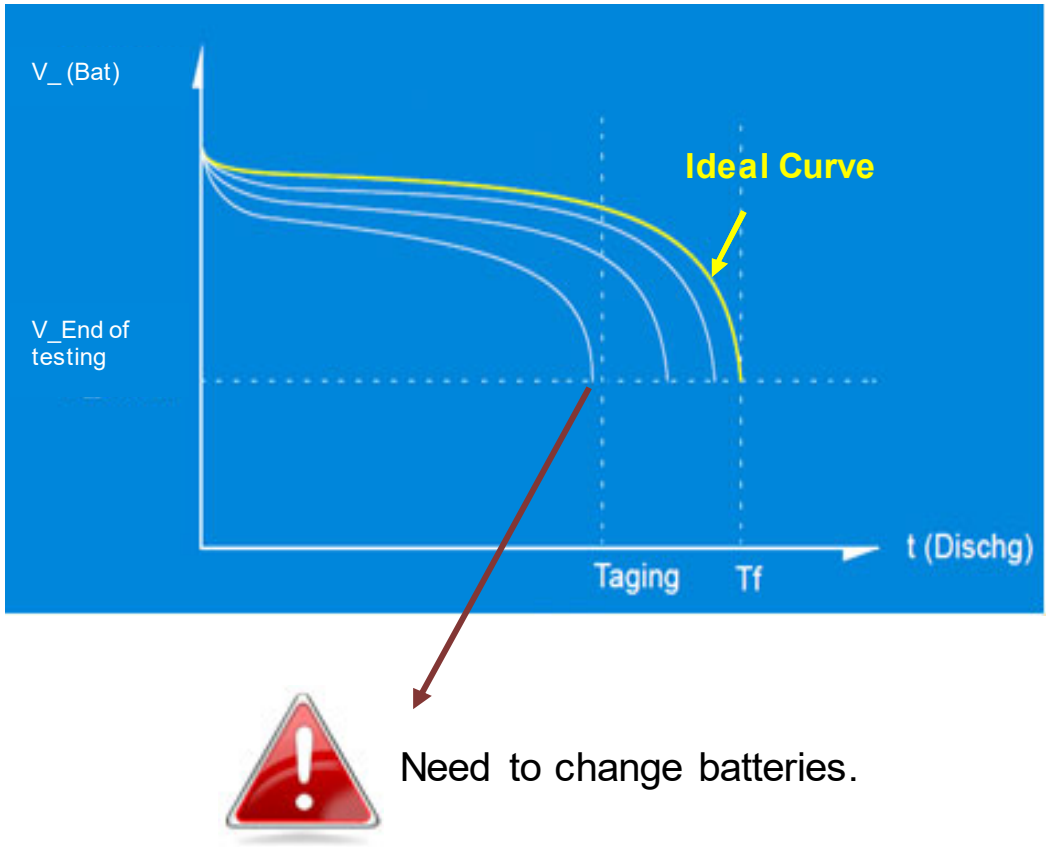
By the loading, we implement an algorithm to calculate the SOH of DC CAP.



***Optional**

Self-detection & pre-warning

電池健康預測



The Battery Health Check

- Battery Missing
- Battery Test
- Capacity Detection
- Aging Prediction

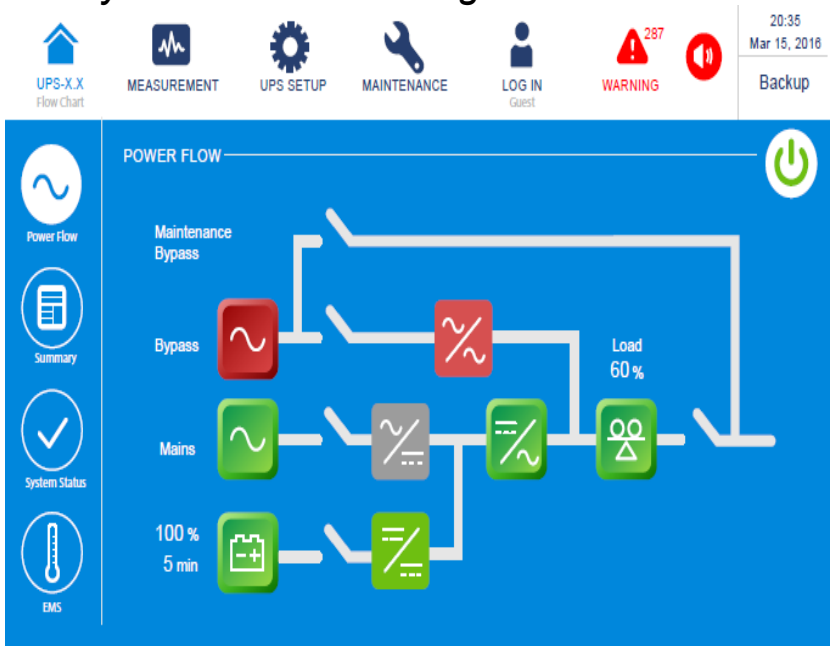
- Compare the discharge curve with the ideal curve to detect the battery health status.
- Alarm when batteries are aging.

***Optional**

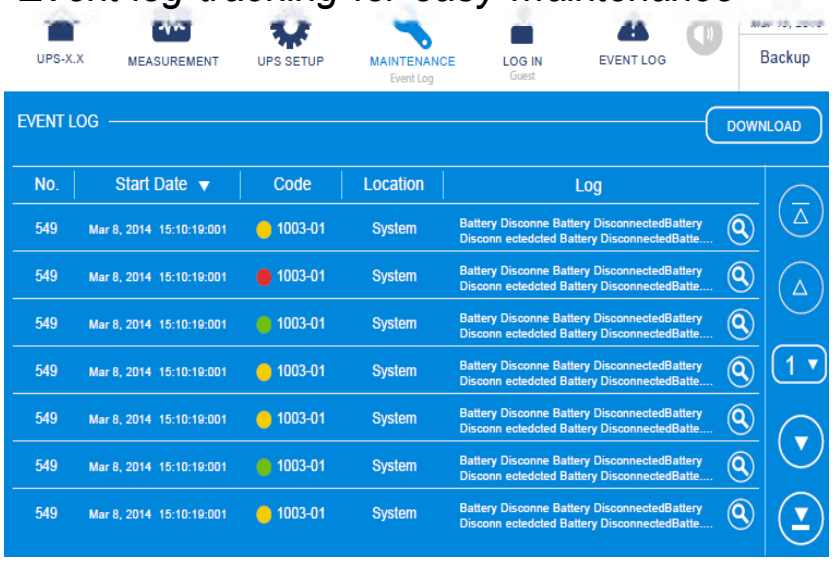
10”彩色觸控螢幕

Monitor other UPS units in parallel

Easily monitor UPS at a glance



Event log tracking for easy maintenance



Clear summary of UPS and battery

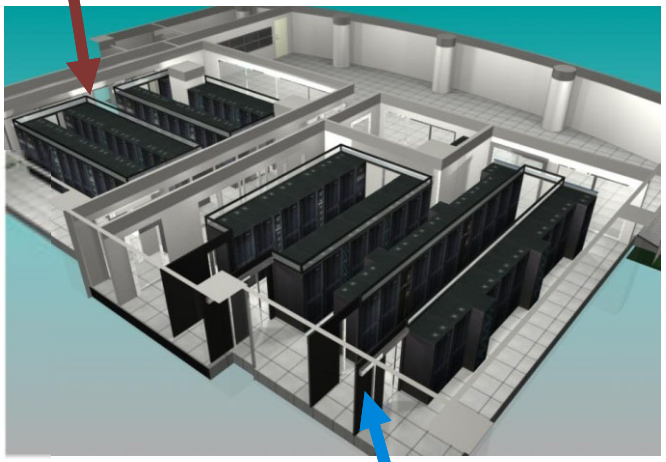
環境管理系統

對廠務主管的好處：

可直接從UPS觸控螢幕上，監視動力室的環境狀態，如安全門禁、漏水偵測、消防和溫濕度管理。

ID	Title	Temperature	Humidity	DI1	DI2	DI3	DI4
0	EMS0	25 °C	60 %	Security	Leakage	Fire	Smoke
1	EMS1	25.1 °C	61 %	Security	Leakage	Fire	Smoke
2	EMS2	25.2 °C	62 %	Security	Leakage	Fire	Smoke
3	EMS3	25.3 °C	63 %	Security	Leakage	Fire	Smoke
4	EMS4	25.4 °C	64 %	Security	Leakage	Fire	Smoke
5	EMS5	25.5 °C	65 %	Security	Leakage	Fire	Smoke
6	EMS6	25.6 °C	66 %	Security	Leakage	Fire	Smoke
7	EMS7	25.7 °C	67 %	Security	Leakage	Fire	Smoke

電力室: UPS+電池+配電

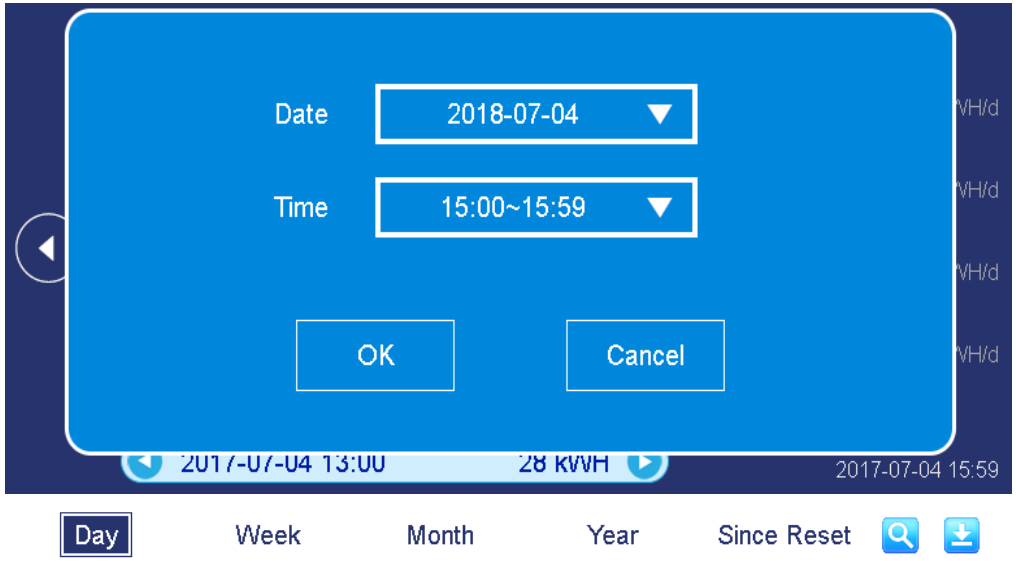


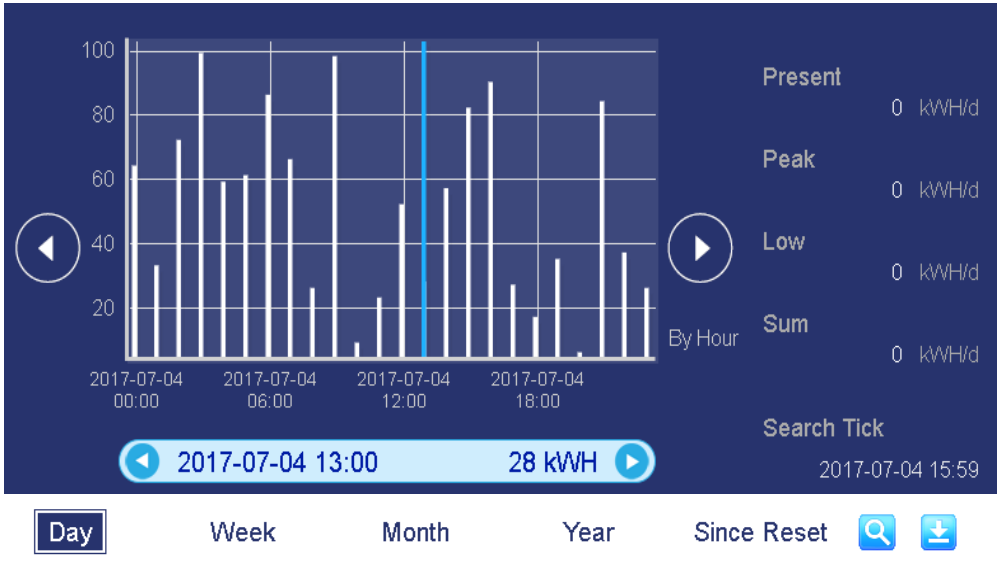
IT機房

電力功耗管理

對廠務主管的好處：

- 監控電力功耗和能耗分析
- 可按日/週/月/年解析用電歷史曲線
- 實現更好的設施管理





通訊界面

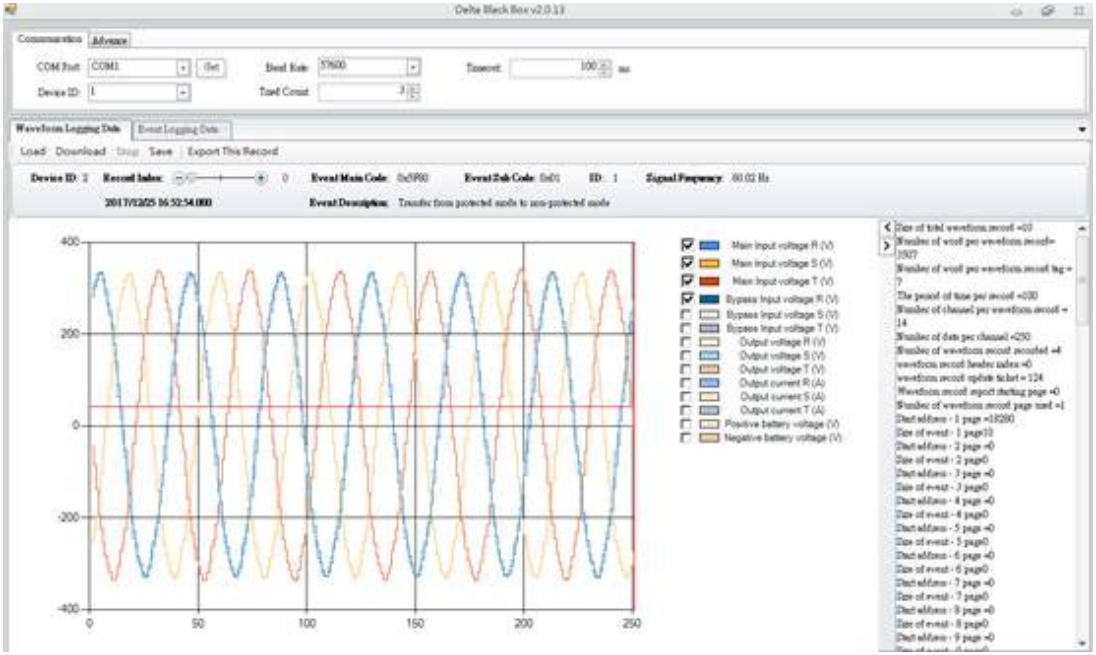
- **EPO**
  reserved for EPO physical button
- **MODBUS**
  providing Modbus communication
- **BMS (VRLA)**
  for battery management system connection

- **DISPLAY**
  for touch screen connection with UPS system
- **EMS**
  for environment mgt. system connection
- **USB**
  for event log download or firmware upgrader
- **Ethernet**
  SNMP

先進的故障紀錄及分析

關鍵參數和波形記錄可支援支持高級事件分析和診斷

- **Event trigger :**
  - Mode switch
  - System shutdown
  - No output (drop load)
- **Waveform recording time frame:** Pre-event 70ms and post-event 30ms
- **Recorded parameters:**
  - Output Voltage
  - Current Wave Display
  - Battery Voltage
  - DC Bus Voltage
  - Input Voltage Wave Display



Software: Delta Black Box

***Optional**

DPH 80/120 VS DPH200

	DPH 80/120	DPH200
電力容量	80kVA/120kVA	200kVA
型式	模組式	模組式
外型尺寸(W*D*H)(mm)	600*850*1445	600*1090*2000
單一電源模組容量	20kVA/20kW	25kVA/25kW
AC-AC最高效率	96%	96%
顯示螢幕	10”彩色觸控	4.7”LCD
最大並聯數	8台	4台
熱插拔模組	電源模組 系統控制器 STS控制器	電源模組 系統控制器 STS控制器
電池數	30 ~ 46 (34只以下降容30%)	40 ± 2
事件紀錄	10,000 筆	3,000 筆
電力模組智慧休眠功能	Yes(休眠+輪巡)	N/A
電池啟動功能(冷啟動)	Yes	Yes
鋰電池管理系統	Yes (台達鋰離子電池)	N/A
環境監管系統(EMS)	Yes (搭配現場感知設備信號輸出)	N/A
輸入/輸出/旁路開關狀態偵測	Yes (需開關具狀態輸出)	N/A
電源波形紀錄器	Yes (選購)	N/A

Delta Confidential

Precision Cooling

台達R系列精密空調

水平送風 氣冷式

R30 (300mm)

R45 (600mm)

規格說明

產品簡介

型號	R30	R45
送風方式	水平送風	
額定製冷量	30kW	45kW
風量	5000 CMH	8600 CMH
電壓	3ϕ, 380-415V, 50/60Hz	
製冷劑	R410A	
再熱器能力	3kW	6kW
加濕器能力	3kg/hr	
認證	CE, RCM	
室外溫度	-20°C ~ 45°C	
尺寸 (寬×深×高)	300 × 1090 × 2000mm	600 × 1090 × 2000mm

* According to ASHRAE 127 standard class 4

產品特色

高效率 & 高可靠度

- 高效率設計
- 高壓艙壓縮機
- 電子式膨脹閥
- 內建油分離器
- 支援雙輸入電
- 風扇冗餘設計
- Zone 4 結構設計

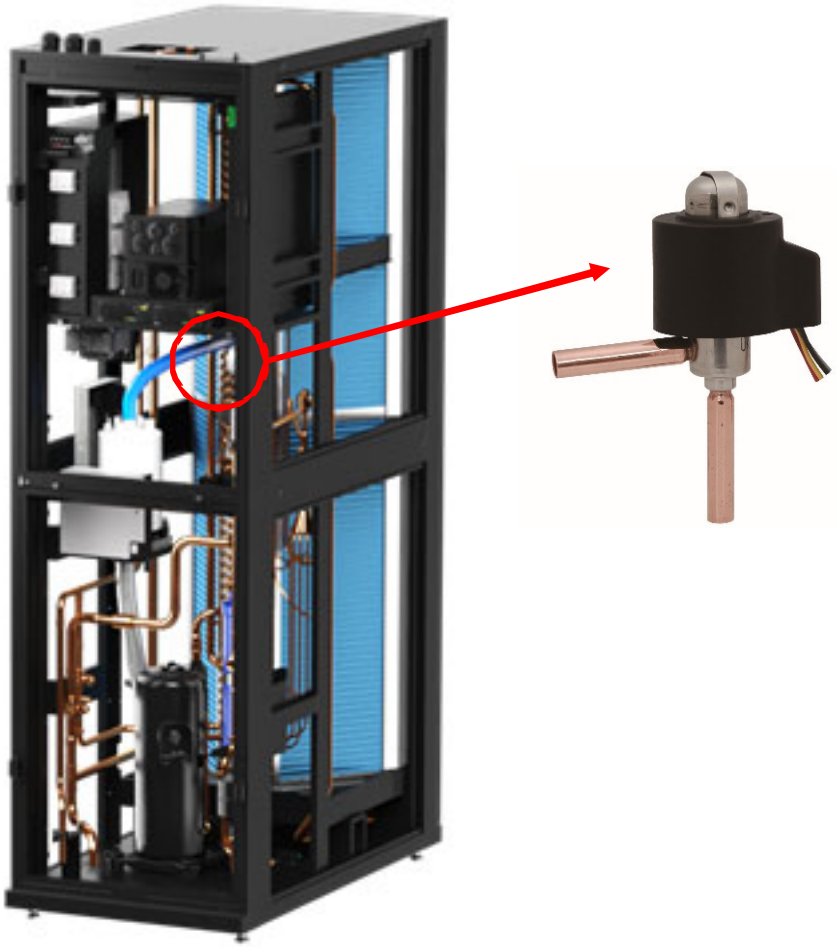
管理性

- 觸摸屏顯示
- 多元控制方式
- 群控功能
- 通訊連結介面

高可用性 & 高彈性

- 電極式與溼膜加濕可選
- 遠程溫溼度傳感器
- 導風扇頁設計
- 1米2 延伸櫃設計
- 可抽拉式電盤設計

電子式膨脹閥



0~100% 冷媒流量控制

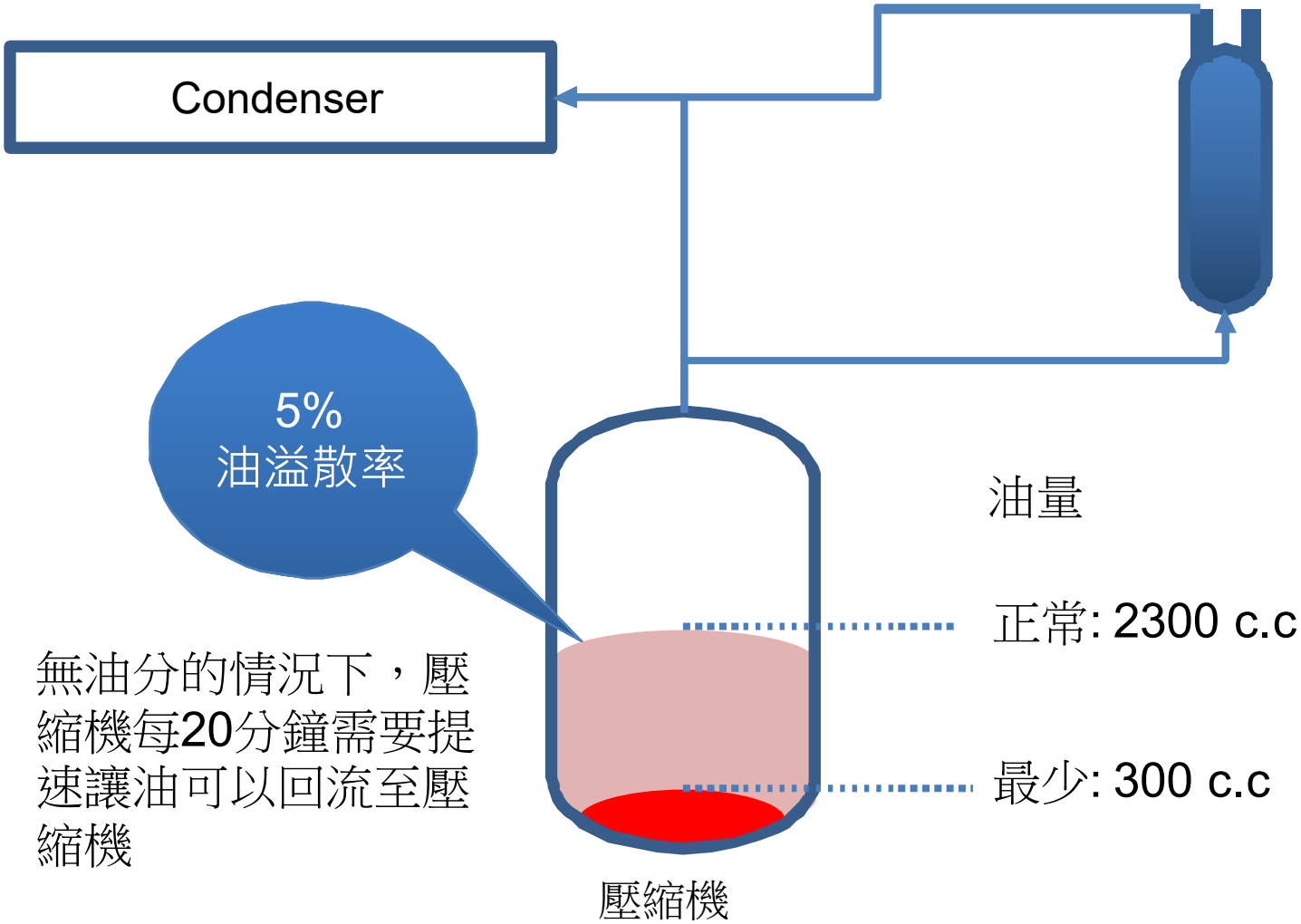
依據數據中心的負載變化，電子式膨脹閥可以精準地調控所需的冷媒流量。可以隨時偵偵測變化，並且較熱力膨脹閥更快速反應

較佳過熱度控制

R30/R45 將過熱度控制在 8°C 左右，可以讓整個機台運作在一個較佳的效率

Type	電子式膨脹閥	熱力膨脹閥
應用情境	精密空調	舒適空調
移動到需求開度時間	18 秒	15 分

內建油分離器



無油分的情況下，壓縮機每20分鐘需要提速讓油可以回流至壓縮機

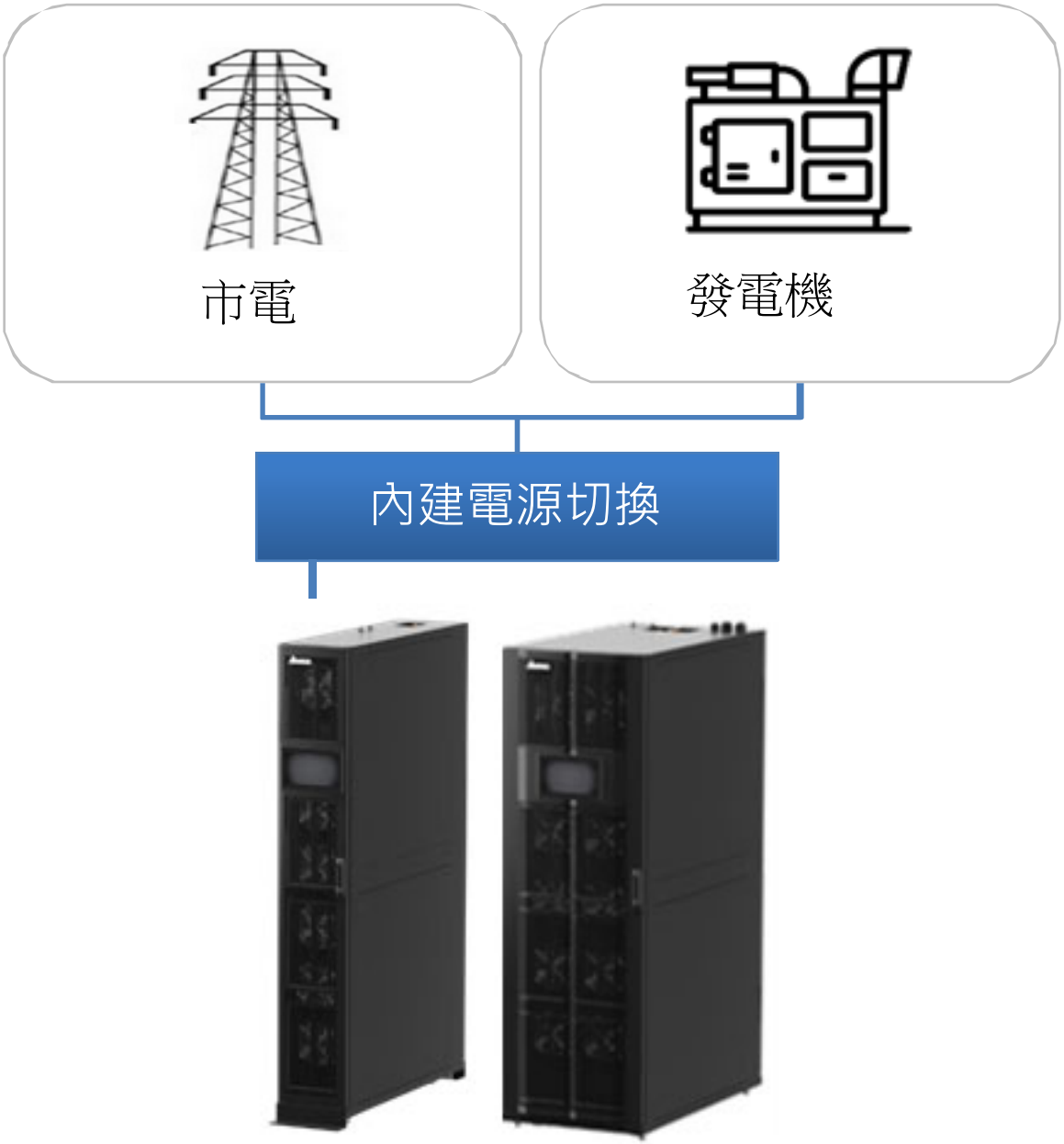
99% 過濾率

油分離器可以將油從氣態冷媒中過濾出來，並且讓其回到油壓縮之中，避免油量的溢散

正常下不需額外添加油

在工廠出廠時即已經進行油量的添加，因此正常情況下現場不需要再進行冷凍油的添加，可以降低現場工作量與時間

支援雙入電設計



雙入電設計

當某一入電源失效時，內建的自動電源切換裝置將切換至另外一入，以提供機台持續的電源

滿足 Tier 3, 4 設計

因為雙入電與自動電源切換的設計，R30/R45可以滿足Uptime Tier 3或4的設計，提供持續製冷功能，而不需要再額外購置其他設備

來電自啟動

若所有的電源都失效的情況下，當電源恢復的情況，空調會自動啟動，並且依之前的設計進行運作，不需要人為介入

*Depends on selected model

風扇冗餘設計

N+2

N+1

正常風量轉速 80%

風扇運轉效率最佳點

風扇的轉速與耗功成3次方比，所以越低的轉速其耗功較低，如下表的比較結果：

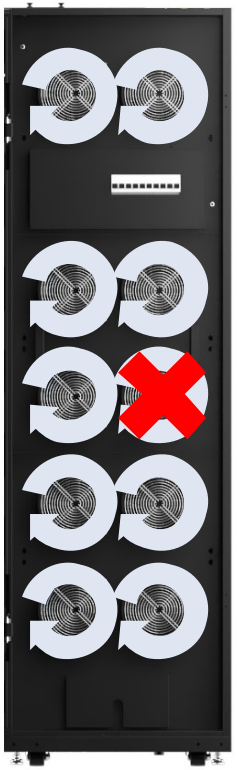
*R45

轉速	風扇耗功
80%	1.64kW
100%	2.54kW
節省	**35%**

自動備援

當有風扇損壞時，其他風扇會自動提速，避免風量的不足

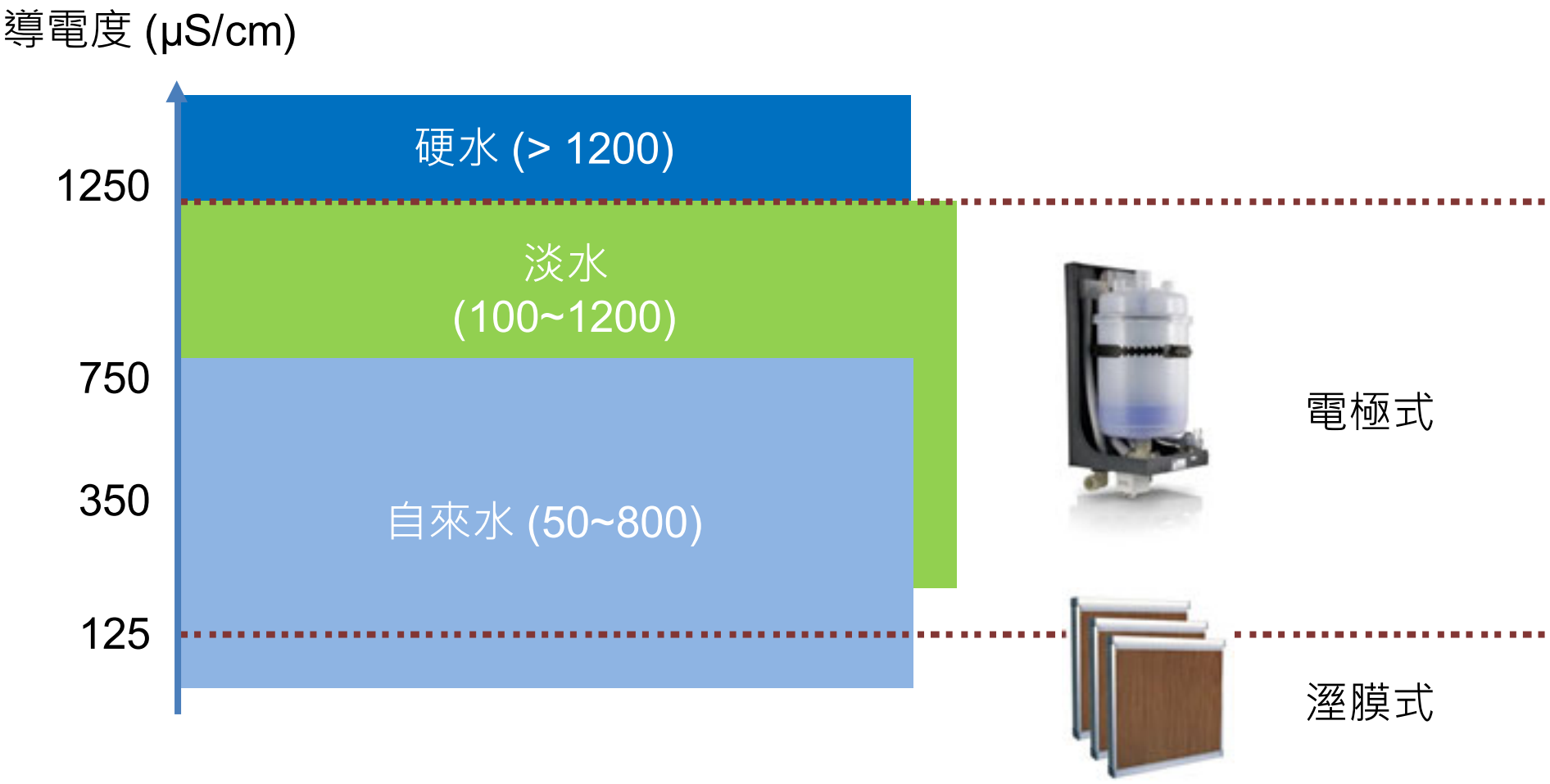
熱插拔風扇



Delta EC fans

- R系列支援熱插拔風扇，因此在風扇損壞的情況下，可以進行更換不需要停機
- 對於熱插拔的風扇最大的挑戰是，風扇在安裝時會被其他運轉中的風扇造成逆轉
- 但透過台達風扇設計，即使被逆轉到 3300 RPM的情況下，在上電後亦可以抵抗逆轉，並且成功的進行正轉

加濕器：電極 & 溼膜



加濕器：電極 & 溼膜

電極式加濕器

- 適用各種水質
- 加濕效率較佳
- 加濕桶需要定期清洗
- 加濕桶容易進行更換

2.25kW

溼膜加濕器

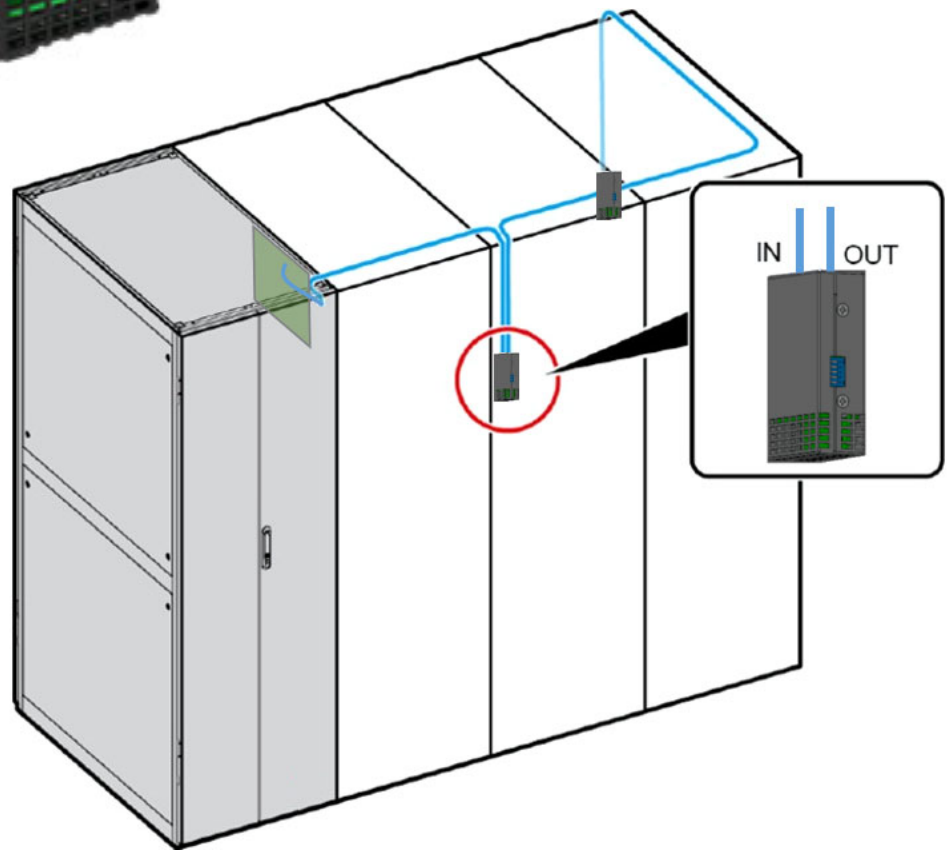
- 加濕過程耗功較低
- 更換成本較低
- 需要較好的水質，避免發生結垢

< 100W

***Optional parts**

遠程溫/濕度傳感器

最多支援10個遠程溫濕度傳感器

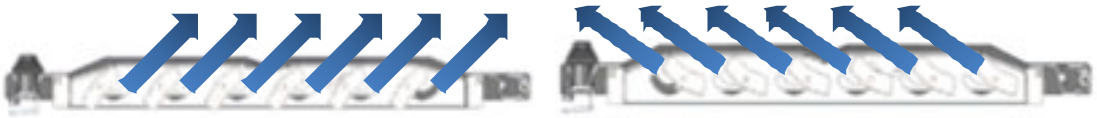


- 遠程溫度計可以用來偵測熱通道、冷通道、重要Server 的進風溫、濕度
- 透過RJ45的線材連接即可，不需要額外提供電源
- 傳感器可以併連連接

***Optional parts**

導風片設計

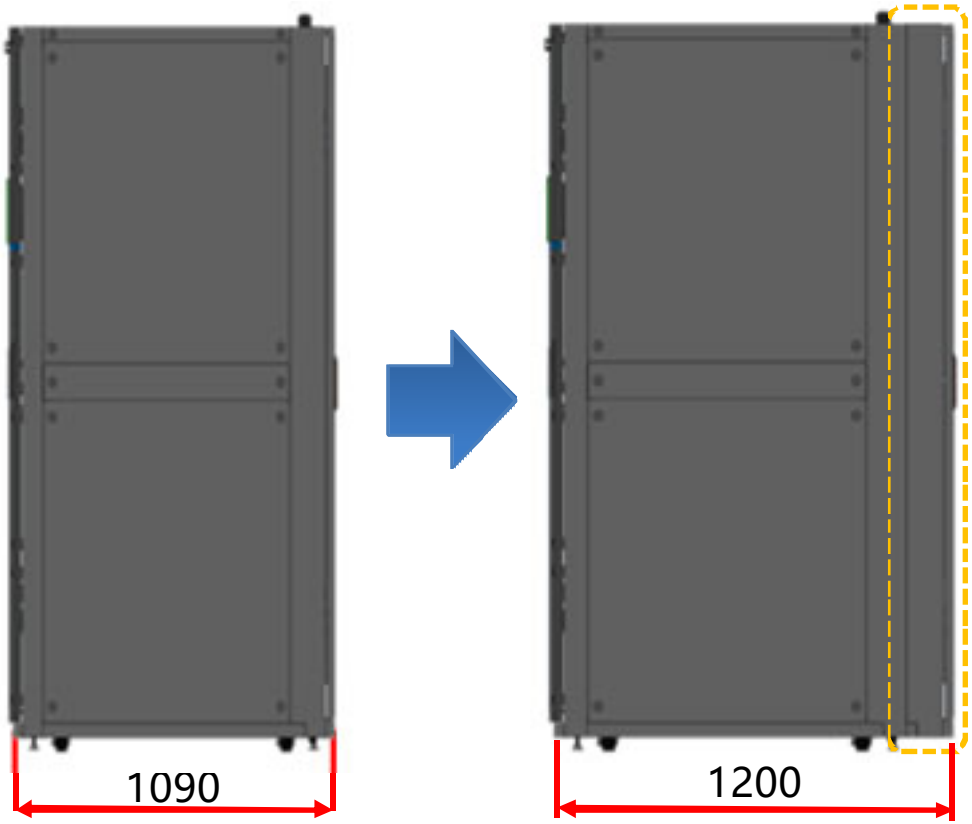
- 若空調被安裝在兩側或底端時，可以提供較佳的氣流方向
- 模組化設計，可以事後直接固定在前門上
- 支援 35°, 60°, 90°, 120°, 145° 角度風向



應用情境

***Optional parts**

1200mm 延伸櫃



延伸櫃設計

- 可以將機櫃從原本的1090mm深度延伸到1200mm
- 可以與現有的後續進行搭配
- 適用於不同情況的冷熱通道設計

***Optional parts**

觸摸屏顯示

透過10”彩色的觸摸屏顯示，可以更容易與全面進行機台管理

主畫面

開機或顯示溫度、濕度、重要元件狀態

量測畫面

顯示系統、風側、冷媒側的重要訊息

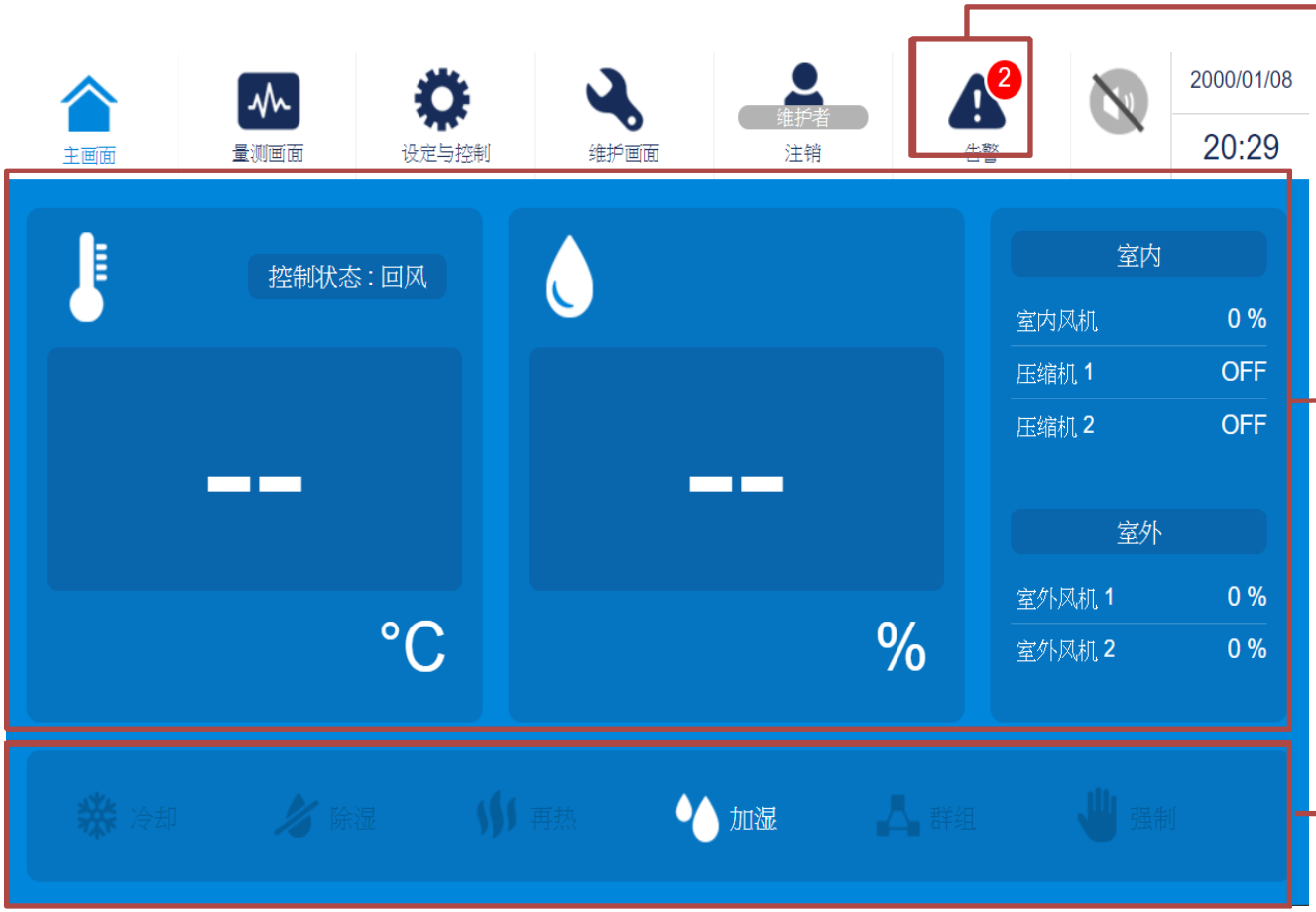
設定與控制

設定各項設定與控制器、告警的設定

維護畫面

重設機台設定或查看機台運作 log、手動操作模式

圖形化觸摸屏



告警指示

可以顯示目前的告警數量，點選後可以顯示詳細的告警內容

關鍵資訊

顯示溫度、濕度、重要的元件(風扇、壓縮機) 運轉情況

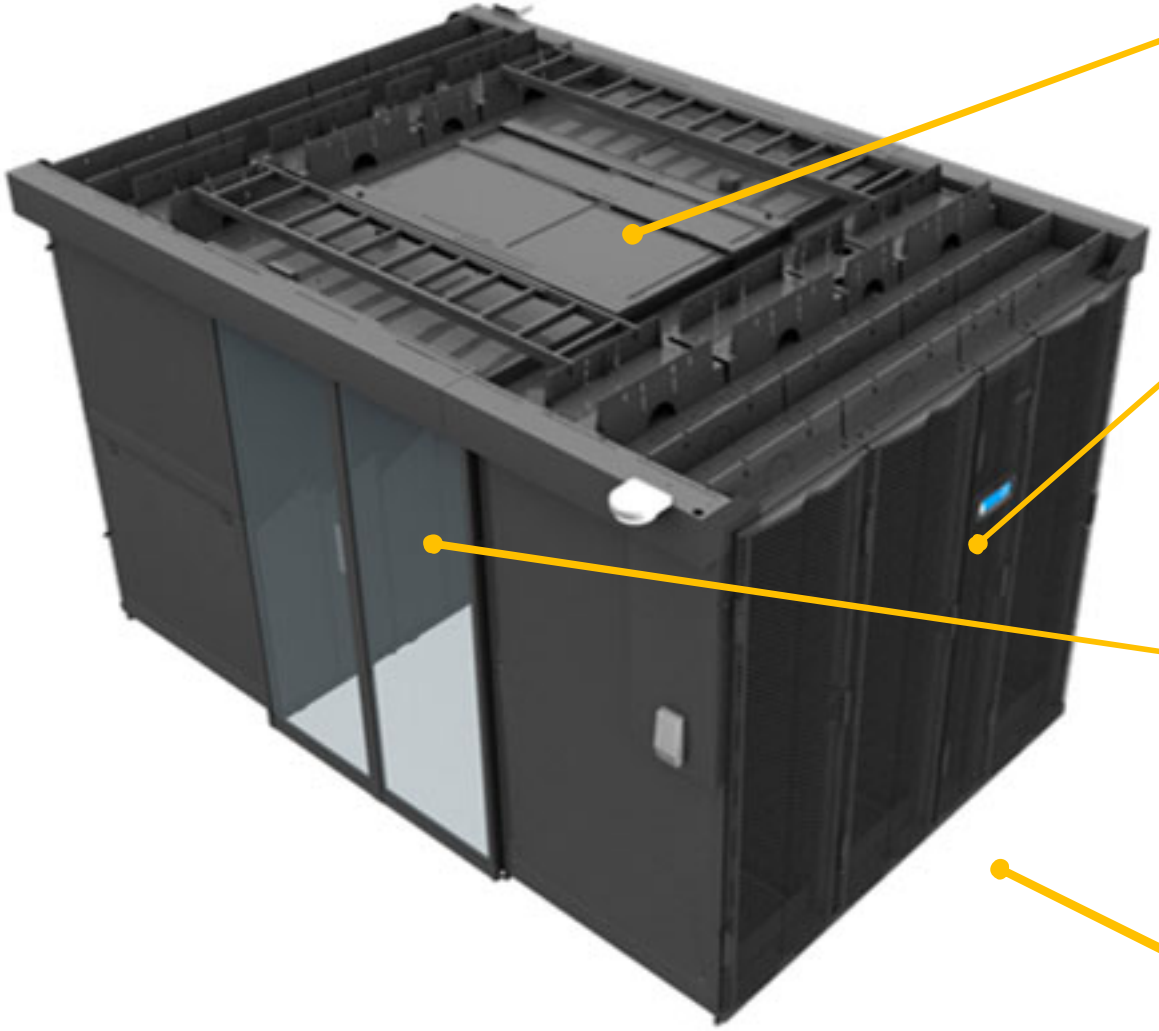
運轉狀態

顯示冷卻、除濕、再熱、加濕、群空、強制運轉模式

機台運作趨勢圖

- 透過圖形化顯示，讓使用者更簡易的了解空調在機房運作情況
- 可以指定特定時間，讓問題的排除更為容易

控制模式



回風控制
透過提昇回風溫度，可以讓機台的運作更有效率

出風控制
最簡易的設定方式，可以直接設定機房需求溫度，可以讓 Server 運作在需求溫度

熱通道控制
適用於低負載情況，可以讓壓縮機持續進行運轉

冷通道控制
可以放置在重要機台前，藉此確保重要 Server 避免有熱點發生

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群組控制

輪值

可以讓所有的空調的運行時間最為平均

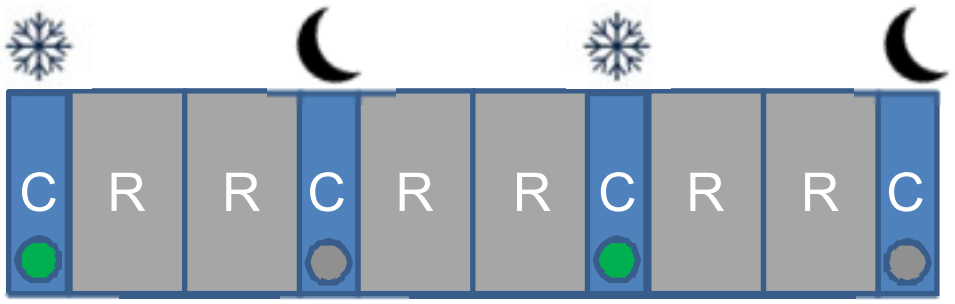
備援

在輪值模式之下，若有空調失效時，則原本備援的台會自動啟動，協進行降溫動作

層疊

如果機房負載偏低時，空調會自動關閉，以節省耗功。相同地，若負責偏高時，空調亦會自動啟動，加入一起進行製冷

負載:
40%



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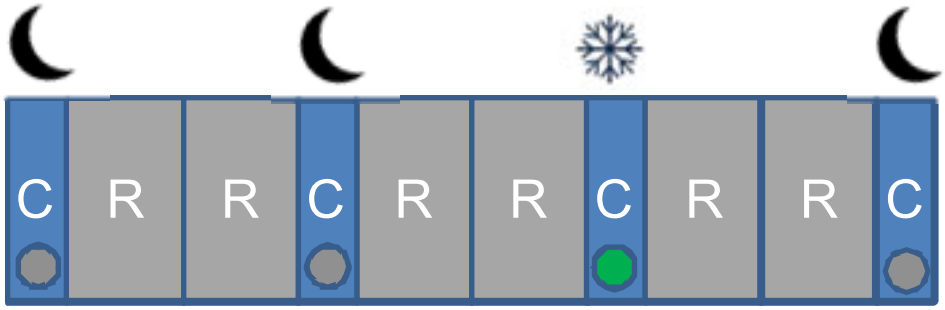

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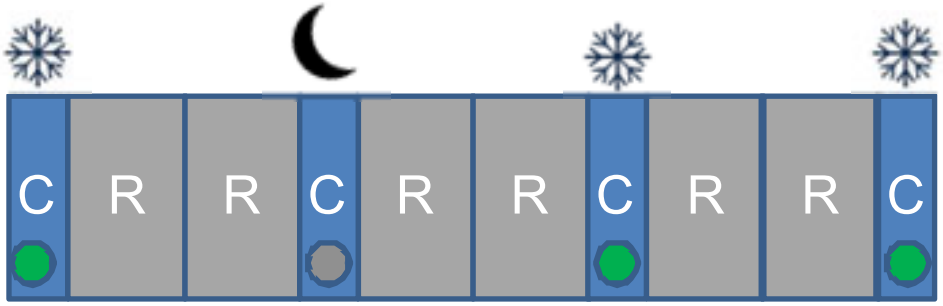

Thanks!

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