



PROCESS AUTOMATION (SEA) PTE LTD
SINGAPORE . MALAYSIA . THAILAND . PHILIPPINES

A close-up photograph of a person's hand holding a blue pen, writing on a green printed circuit board (PCB). The background is a dark blue with a faint, glowing circuit board pattern. The lighting is dramatic, highlighting the hand and the pen tip.

QP[®]
QUALITY POWER

YOUR PLATING SOLUTION



場内工作情況
Working condition inside the factory



自動生產設備
Automatic production line



生產工廠
Production Factory

Company Profile

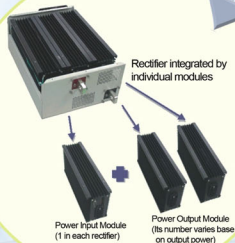
PAL's product ranges from surface finishing, production lines to water treatment systems. We also provide customer with consultation services for their specific production and engineering requirements.

PAL's equipment has been well known for its reliability and durability. Our technical staff has the ability to abundantly evaluate your production and engineering requirements to provide you with a system and engineering solution that is cost effective and matches your specific needs. PAL has been provided with one of the most advanced turn-key metal finishing operations in the market today. There are currently over 40,000 units of QP rectifier in the market.

Our Commitment

1. Provide engineering solution with innovative design
2. Uncompromised quality assurance in workmanship and services
3. Timely spare part delivery
4. Round the clock customer service support





Features :

- Each individual module installed in corrosion-resistant chassis with self-cooling function
- No extra protection facilities needed for the rectifier working in plating environment
- Can operate in normal condition without adding any cooling facilities
- Low ripple factor contributing good plating distribution
- Extremely compact design
- Ease of interface with computer for automatic control (Series, Wireless, Analog)

Customer List :

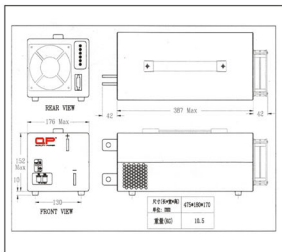
- Multek
- KB PCB Group
- Astron Group Ltd
- Meadville (China)
- Compeg (Taiwan)
- EPC (Hong Kong)
- ASM (Hong Kong)
- Elec & Elitek (Thailand)
- Hitachi Chemical (Singapore)
- ASE (Taiwan)
- Elna PCB (Malaysia)
- Nan Ya PCB (Taiwan)
- Topsearch (Hong Kong)
- MFS Technology (China)
- ViaSystems (Hong Kong)
- Shan Poornam Global (Malaysia)
- First Sumiden Circuits Inc. (Philippines)
- UniMicron Group (Taiwan)
- MFS Technology (Malaysia)
- MFS Technology (Singapore)
- ON Semiconductor (Malaysia)



QMB- Series DC rectifier (Output Ripple <1%)
QMB- 系列直流整流器 (輸出紋波低於1%)

Dimension
機箱尺寸圖

Model NO. 型號	Output Voltage *輸出電壓 (V)	Output Current *輸出電流 DC (A)	NO. Output Module *功率模塊 (PCS)
QMB1000S5	5	200	1
QMB1020S6	6	170	1
QMB1000S8	8	125	1
QMB1000S10	10	100	1
QMB1080S12	12	90	1
QMB1050S15	15	70	1
QMB1020S17	17	60	1
QMB1000S20	20	50	1
QMB1050S30	30	35	1

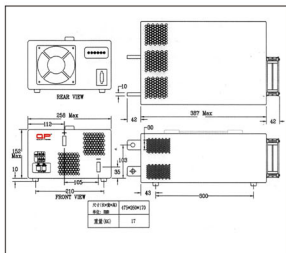




QMB-Series DC rectifier (Output Ripple <1%) QMB-系列直流整流器 (輸出紋波低於1%)

Model NO. 型號	Output Voltage *輸出電壓 (V)	Output Current *輸出電流 DC (A)	NO. Output Module *功率模塊 PCS
QMB2000S5	5	400	2
QMB2040S6	6	340	2
QMB2000S8	8	250	2
QMB2000S10	10	200	2
QMB2160S12	12	180	2
QMB2100S15	15	140	2
QMB2040S17	17	120	2
QMB2000S20	20	100	2
QMB2100S30	30	70	2

Dimension 機箱尺寸圖

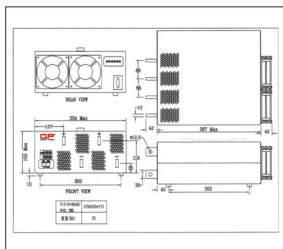




QMB-Series DC rectifier (Output Ripple <1%)
QMB-系列直流整流器 (輸出紋波低於1%)

Model NO. 型號	Output Voltage 輸出電壓 (V)	Output Current 輸出電流 DC (A)	NO. Output Module 功率模塊 (PCS)
QMB3000S5	5	600	3
QMB3060S6	6	510	3
QMB3000S8	8	375	3
QMB3000S10	10	300	3
QMB3240S12	12	270	3
QMB3150S15	15	210	3
QMB3060S17	17	180	3
QMB3000S20	20	150	3
QMB3150S30	30	105	3

Dimension
機箱尺寸圖

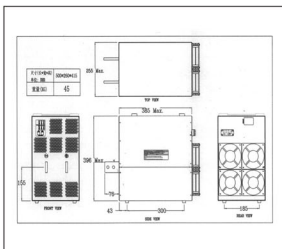




QMB- Series DC rectifier (Output Ripple <1%)
QMB- 系列直流整流器 (輸出紋波低於1%)

Model NO. 型號	Output Voltage 輸出電壓 (V)	Output Current 輸出電流 DC (A)	NO. Output Module 功率模塊 (PCS)
QMB600S5	5	1200	6
QMB6120S6	6	1020	6
QMB600S8	8	750	6
QMB600S10	10	600	6
QMB6480S12	12	540	6
QMB6300S15	15	420	6
QMB6120S17	17	360	6
QMB600S20	20	300	6
QMB6300S30	30	210	6

Dimension
機箱尺寸圖

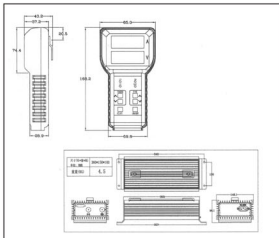




QMY- Series DC rectifier (Output Ripple <1%)
QMY- 系列直流整流器 (輸出紋波低於1%)

Dimension
機箱尺寸圖

Model NO. 型號	Output Voltage 輸出電壓 (V)	Output Current 輸出電流 DC (A)
QMY5S5	5	1
QMY30S6	6	5
QMY240S8	8	30
QMY50S10	10	5
QMY300S12	12	25
QMY300S15	15	20
QMY250S5	5	50
QMY300S6	6	50
QMY350S10	10	35



雙顯示微處理器通訊模塊 (RS-485 通訊)

雙顯示微處理器通訊模塊, 電流顯示, 電壓顯示 和 RS-485 微處理器通訊控制功能, 是直流整流器自動控制的介面。此通訊板透過 RS-485 通訊線將整流器連接到電腦或 PLC。使用家能簡單直接控制整流器。通訊板具有以下特點:

- 雙顯示, 顯示電流, 顯示電壓
- 單台電腦或 PLC 可同時控制多達 99 台整流器
- 高度兼容個人電腦或 PLC 作自動控制
- 輸出控制準確
- 使操作更有效率, 彈性
- 具備閉環控制及實時輸出監察機制

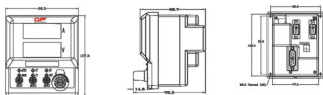
Dual Display with Micro-Controller Communication Module (DDMCCM) For DC rectifier (RS-485 Communication)

DDMCCM is control panel with dual display (current display, voltage display) and RS485 micro-controller communication module for DC rectifier. The computer/PLC connects to the rectifier directly through the MCCM with following features:

- Dual display, current display and voltage display.
- Highly compatible with computer/PLC for automation control.
- It makes the operation more flexible and efficient.
- Up to 99 rectifiers can be controlled by only one single computer/PLC.
- Accurate control the output.
- Close loop control mechanism and real time monitoring output status

尺寸規格

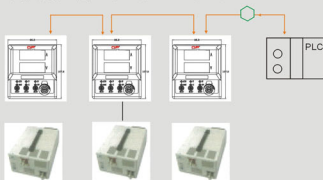
Dimension of DDMCCM



尺寸規格(長*闊*高) Dimension (L*W*H)

96.3mm x 107.2mm x 73.5mm

布線示意回圖 Topology of Wiring Diagram



所有的控制均透過 PLC DM 位置進行, 而無須其他的通訊協議

All Rectifier Control operation through PLC DM area only, user doesn't need prepare communication protocol.

PLC DM Location						
	0	1	2	3	...	9
D0000						
D0010						



QPM-Series Pulse Rectifier

It is an innovative rectifier for plating application in both modes PULSE mode and DC mode. Core competencies of pulse rectifier are to optimize plating process, provide higher plating quality, better metal distribution.

It provides a higher plating quality, better distribution, higher capacity and especial advantages for the plating industries. There are some of advantages and features:

- Excellent Distribution
- Shorten The Plating Time
- Use Less Electrolyte
- Reliability
- Compact
- Low voltage
- Module add-on
- Sophisticated Alarm features

General Technical Specifications:

Forward Current:

Range: 0~100A

Resolution: 1A

Forward Time:

Range: 0.3~99.9ms

Resolution: 0.1ms

Off Time:

Range: 0.3~99.9ms

Resolution: 0.1ms

Model List:

Model	Output Current	Output Voltage
QPMS0120GA00	120A	15V



QPM -系列脈衝整流器

這是一個現代化電鍍技術的整流器，為電鍍工藝提供脈衝 (PULSE) 應用電源及直流 (DC) 應用電源。脈衝電源能夠優化電鍍工藝，提高電鍍質量，均勻分布的金屬鍍層。

在電鍍應用方面，它能提供高質量，高均勻的分布金屬鍍層，高效率和多類優點的電鍍工藝。以下僅列出數個優點：

- 優越的平均鍍層
- 輕巧體質少
- 提升電鍍速度
- 低壓
- 節省光劑
- 模組
- 可靠性高 / 耐用
- 精確而簡潔的警報訊息

脈衝整流器的規格：

脈衝電流：
範圍：0-100 安培 (A)
可調校精度：1 安培 (A)

脈衝時間：
範圍：0.3-99.9 毫秒 (ms)
可調校精度：0.1 毫秒 (ms)

靜止時間：
範圍：0.3-99.9 毫秒 (ms)
可調校精度：0.1 毫秒 (ms)

現有以下型號可供選擇：

型 號	輸出電流 (A)	輸出電壓 (V)
QPMS0120GA00	120A	15V



QPL-Series Pulse Rectifier

It is an innovative rectifier for plating application in both modes PULSE mode and DC mode. QPL series provide low power output, both DC and pulse output can be made in one single unit.

General Specifications :

Forward Current:
Range: 0~100A
Resolution: 1A

Forward Time:
Range: 0.3~99.9ms
Resolution: 0.1ms

Off Time:
Range: 0.3~99.9ms
Resolution: 0.1ms

Model	Output Current	Output Voltage
QPLS0010GXXX	10A	15V
QPLS0020GXXX	20A	15V
QPLS0030DXXX	30A	8V





QPL -系列脈衝整流器

這是一個現代化電鍍技術的整流器，為電鍍工藝提供脈衝 (PULSE) 應用電源及直流 (DC) 應用電源。脈衝電源能夠優化電鍍工藝，提高電鍍質量，均勻分布的金屬鍍層。QPL 系列主要應用於低功率輸出，並可於同一部機作直流及脈衝輸出。

脈衝整流器的規格：

脈衝時間：	靜止時間：
範圍：0.3—99.9 毫秒 (ms)	範圍：0.3—99.9 毫秒 (ms)
可調校精度：0.1 毫秒 (ms)	可調校精度：0.1 毫秒 (ms)

現有以下型號可供選擇：

型 號	輸出電流 DC (A)	輸出電壓 (V)
QPLS0010GXXXX	10	15
QPLS0020GXXXX	20	15
QPLS0030DXXXX	30	8



QPG-Series Reverse Pulse Plating Rectifier

Pulse Generator is an innovative design of reverse pulse rectifier. It takes DC current as input, and output reverse pulse current. The future trends of Printed Circuit Board (PCB) design is pursuing more and more layers to minimize surface area. That means the board thickness will increase and through-hole diameters decrease. Plating using Pulse Generator can fulfill these plating requirement. It can also provides required uniformity of metal distribution and volume production for Multi-layers & High Aspect Ratios of PCB.

Core competency of Pulse Generator are to optimization the production process, to provide a higher plating quality, higher capacity and especial advantages for the Plate Through Hole (PTH) with High Aspect Ratio's PCB. Main features of Pulse Generator:

- Excellent distribution
- High uniformity of coating of Plate Through Hole
- Shorten the plating time
- High capacity of production
- Save electrolytic additive
- High reliability
- Compact in size
- Low voltage
- Multi-unit control and PC control with international communication standard RS-485
- To form a multi-unit link, up to 32 unit of rectifiers in a single link.

Specifications

Model: QPGS0300D0900JSA00

Input:

Forward Input Voltage: 10 Vdc max.
 Forward Input Current: 300 Amp
 Reverse Input Voltage: 20Vdc max.
 Reverse Input Current: 100 Amp

Output:

Forward Output Current:
 Range: 0-300A
 Resolution: 1A
 Forward Output Voltage: 0-8V

Reverse Output Current:

Range: 0-900A
 Resolution: 1A
 Reverse Output Voltage: 0-18V

Forward pulse Time:

Range: 0.3-99.9ms
 Resolution: 0.1ms

Reverse pulse Time:

Range: 0.3-7.0ms
 Resolution: 0.1ms

Dimensions: 469.5mm X 291.2mm X 180.8mm (LxWxH)



QPG-系列脈衝整流器

脈衝發生器能夠優化生產製程，提供高質量、高產量的技術，特別在於高板厚度鍍與孔徑比的PCB。以下僅列出數個優點：

- 優越的均勻鍍層
- 高均勻度的通孔
- 縮短電鍍時間
- 高品質
- 節省添加劑
- 可靠性高
- 體質輕巧
- 低電壓
- 使用國際通訊標準 (RS 與) 通訊
- 多 32 台整流器連成單一的控制網，便於控制

型號：QPGS0300D0900JSA00

輸入：

電壓：正電壓：最大 10Vdc

反電壓：最大 20Vdc

電流：用家自訂，但須大於脈衝發生器輸出

正向輸出電流：

範圍：0-300 安培(A)

可調校精度：1 安培(A)

正向輸出電壓：

範圍：0-10V

自動由機器根據輸入電流和負荷調節

反向輸出電流：

範圍：0-900 安培(A)

可調校精度：1 安培(A) 反向輸出電壓：

範圍：0-20V

自動由機器根據輸入電流和負荷調節

正向輸出時間：

範圍：0.3-99.9 毫秒(ms)

可調校精度：0.1 毫秒(ms)

反向輸出時間：

範圍：0.3-7 毫秒(ms)

可調校精度：0.1 毫秒(ms)

機箱尺寸：469.5 毫米 x 291.2 毫米 x 180.8 毫米 (長 x 闊 x 高)



ADDA-Meter

- Terminals for external analog

Dual Display Meter (DD Meter)

- To integrate with DC rectifier
- Current display & Voltage display in one panel
- Manual mode/ Auto mode selection
- CC/ CV selection
- On/ Off selection
- Output Control adjustment with high precision potential-meter
- Terminals for external control

Dual Display Micro-Controller Communication Meter (DDMCCM)

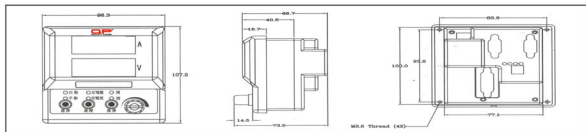
- RS-485 communication module for automation control to integrate with PLC or Computer or other RS-485 communication product.
- To integrate with DC rectifier
- Current display & Voltage display in one panel
- CC/CV selection
- On/ Off selection
- Output Control adjustment with high precision potential-meter under manual mode

ADDA-Meter

- Terminals for external analog signal control, control rectifier output, read rectifier output voltage, and output current.
- With isolation circuit to insolate control signal between PLC and DC rectifier.
- Current display & Voltage display in one panel
- Manual mode/ Auto mode selection
- CC/CV selection
- On / Off selection
- Output Control adjustment with high precision potential-meter under manual model



機箱尺寸圖



雙顯示控制表

- 配合直流整流器使用
- 在一控制面板上同時顯示電流、電壓
- 手動/自動選擇
- 定電流/定電壓選擇
- 開機/關機選擇
- 高精度的變阻器調節輸出
- 外接端子，供自動控制訊號

雙顯示RS485微處理器 通訊控制模塊 (DMCCM)

- RS485 通訊線將整流器連接上電腦或 PLC 直接控制整流器
- 配合直流整流器使用
- 在一控制面板上同時顯示電流、電壓
- 手動/自動選擇
- 定電流/定電壓選擇
- 開機/關機選擇
- 高精度的變阻器調節輸出

數字/模擬控制表

- 外接端子，供自動控制訊號
- 具有訊號隔離的電子線路，隔離 PLC 與 DC 間的自動控制訊號，減低相互干擾
- 在一控制面板上同時顯示電流、電壓
- 手動/自動選擇
- 定電流/定電壓選擇
- 開機/關機選擇
- 高精度的變阻器調節輸出



DC rectifier for QPG - Dual Output DC rectifier

It is a special DC rectifier for QPG. It consists two unit of DC rectifier. One for forward power source of QPG and another is for reverse power source of QPG

Specification(QMB3000S10/2000S20)

Forward unit

Output Current: 300A dc

Output Voltage: 10 V dc

Reverse unit

Output Current: 100A dc

Output Voltage: 20 V dc

脈衝整流器專用的直流整流器-雙輸出直流整流器

它是一個雙輸出的直流整流器作為脈衝發生器的前級，其中的一個輸出提供給正脈衝的電源，另一個提供給負脈衝的電源。

規格(QMB3000S10/2000S20)

正向輸出：

輸出電流：300 A dc

輸出電壓：10 V dc

反向輸出：

輸出電流：100 A dc

輸出電壓：20 V dc



Current Distributor for DC rectifier

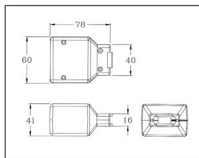
- To combine two same model DC rectifiers together to double its output current.
- Two units of DC rectifier control by one display control panel.

直流整流器電流分配器

- 並兩個相同型號的直流整流器，使它有兩倍的輸出電流。
- 一個顯示控制器可控制兩台整流器。

Dimension

尺寸圖



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