

Quasar is a line of switch-mode rectifiers for surface treatment processes, electro-winning and water treatment, that adopts pulse width modulation (PWM) technique for the controlling of current amplitude.

Electrical Features

- > High speed IGBT technology
- > Modular power platform
- > Microprocessor controlled
- > High speed polarity switching
- > Up to 40% power saving vs. Silicon Controlled Rectifier (SCR)
- > $\text{Cos } \varnothing \geq 0.93$ at rated load
- > Low output current ripple
- > High precision voltage and current regulation (1000 steps)
- > Fast response time and high stability to load variation (~1ms)

Hardware Features

- > 15 to 170cm height
- > 43 x 43cm base size
- > Light weight
- > Main switch and operator control panel in the front
- > All input/output connections in the back for easy access

Software Features

- > Simple output parameters and waveform programming from the operator panel (current, voltage, cycle time and ramp time)
- > Customized software available
- > A/h and A/min meters for precise thickness and dosing pumps control

Available Interfaces

- > RS485 *
- > RS232 *
- > Profibus-DP
- > DeviceNet
- > Analogue 0-10V
- > Analogue 4-20mA

* Standard feature

Operation Modes

- > Manual
- > Automatic (Via PC or PLC)

Machine Types

PP - Pulse Plating (forward)

Rectifiers designed to handle forward pulsed output current with the possibility to create, via software, special mixed waveforms with DC & pulsed output current. These rectifiers are able to generate very fast and complex current and voltage patterns (repetitive sequence of pulses) where minimum pulse (phase) duration is 1ms.

Using these fast pulse patterns in combination with appropriate chemical products, remarkable improvements are obtained.

PPR - Pulse Plating Reverse (forward and reverse)

Rectifiers designed to handle forward and reverse pulsed output current, tailored for applications that require very fast polarity changes and pulse (phase) duration as low as 1ms.

In order to accomplish synchronized pulses, 2 machines can be networked in Master & Slave configuration, being able to perform in 2 different working modes: synchronous and asynchronous (pulses 180° out of phase). Nevertheless they can operate like normal DC machines.

These rectifiers, via software, are able to handle a current pattern of up to 6 phases (more phases on request).



16V/300A(600A) PP mini air cooled, 400VAC



16V/1000A(2000A) PP air cooled, 400VAC



16V/1000A(3000A) PPR air cooled, 400VAC

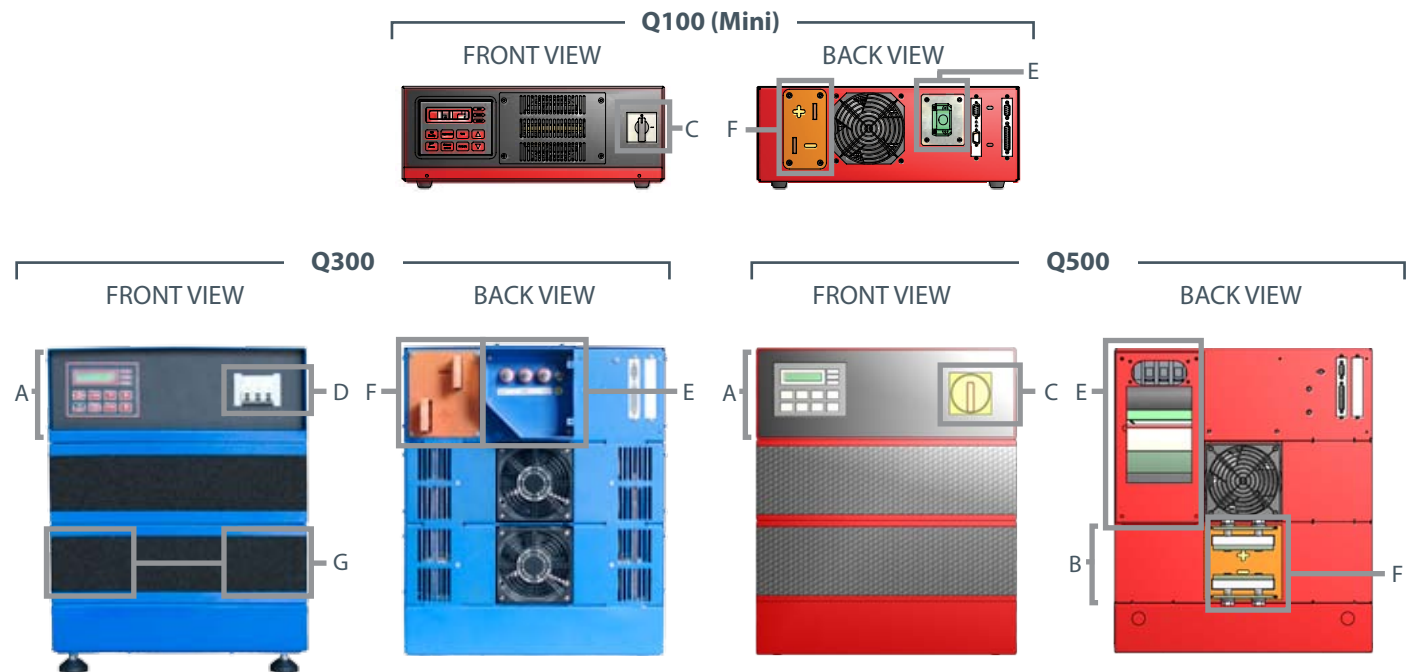
— 2 Year Warranty —

Type	Output ¹			Most common applications
	Voltage [V]	Max current ² [A]		
		Air	Water	
PP - Pulse Plating (forward)	8(16) - 15(30)	5000(10000)	5000(10000)	Copper processes Decorative chrome Precious metals
PPR - Pulse Plating Reverse (forward and reverse)	8(16) - 15(30)	3000(60000)	5000(10000)	PCB (Printed Circuit Board) Hole metallization Nano-structure generation

¹ Based on machine's configurations with an input voltage of 400VAC. Value between () refers to the max pulsed current or voltage.

² Max pulsed current is up to 3 times the max DC current value.

Hardware Differences of Quasar Models (Forward Configuration)



- > A. HEADER - Present only on Q300 & Q500 models
- > B. INTERMEDIATE COOLING UNIT - Present only on Q500 model
- > C. MAIN I/O SWITCH - Present only on Q100 & Q500 models
- > D. CIRCUIT BREAKER - Present only on Q300 model
- > E. AC INPUT UNIT - Type, size and location vary per model
- > F. OUTPUT CONNECTIONS - Type and location vary per model
- > G. ADDITIONAL FANS ON EACH MODULE TO COOL PWR CARDS - Present only on Q300 model

Technical Specifications
ELECTRICAL SPECIFICATIONS

		Q100 model	Q300 model	Q500 model
Output	Current ⁽¹⁾	PP 100(200) - 300(600)A	400(800) - 1000(2000)A	1500(3000) - 5000(10000)A
		PPR 100(300) - 250(750)A	300(900) - 1000(3000)A	1500(4500) - 5000(10000)A
	Voltage ⁽²⁾	8(16) - 15(30)VDC		
	Max. pulsed current	Up to 3 times the max DC current value depending on the pattern required		
	Hardware control method	Current control		
	Control accuracy	1/1000 of max current or voltage		
	Current regulation range	5 - 100% of max current		
	Voltage regulation range	5 - 100% of max voltage		
	Current ripple	< 2.0% of regulation range	< 0.5% or < 3.0% of regulation range depending on output capacitors	
	Efficiency	87% (typ.)		
	Forward ↔ Reverse current slew rate - PPR	$\Delta V_0/L$ [A/μs] Where ΔV_0 = Output voltage excursion L = Output connection cables inductance in μH		
	Pulse width (forward/reverse)	1 - 200ms in 0.1ms steps		
	Forward : Reverse duty ratio - PPR	1 : 3 Standard. For other values contact our R&D department		
Secondary withstand voltage	500VAC 50Hz 1min. between Secondary to Earth			
Main Supply	Line voltage	3 x 230VAC ± 10%, 3 x 400VAC ± 10%, 3 x 440VAC ± 10%, 3 x 480VAC ± 10% or 3 x 550VAC ± 10%		
	Frequency	50 - 60Hz		
	Neutral	NOT USED		
	Power factor	> 93%		
	Primary current in max DC	Max 20A	Max 125A	Max 160A per tower
	Earth leakage current	See EMC filter input specifications		
	Primary withstand voltage	According to IEC 60204		

⁽¹⁾ Based on machine's configurations with an input voltage of 400VAC. Value between () refers to the max pulsed current.

⁽²⁾ Value between () refers to the max pulsed voltage.

GENERAL SPECIFICATIONS

		Q100 model	Q300 model	Q500 model
Technology		Switching mode PWM, IGBT output transistors		
Cooling Systems		Air (CFM is provided)		
		Water (L/h and pressure drop is provided)		
Operation Conditions	Location	Indoor use only		
	Ambient temperature	0 - 40°C		
	Relative humidity	15 - 85% not condensing		
	Filter obstruction - air cooled	15% max		
	Water input temp. - water cooled	19 - 22°C		
	Altitude	<= 1000m		
Degree of Protection	Air cooled	IP33	IP21	IP33
	Water cooled	IP43		
Conformity of EU Directives		2006/95/EC - Low Voltage Directive		
		2004/108/EC - Electromagnetic Compatibility		
		2006/42/EC - Machines Directive		

SERIAL INTERFACE
Communication Ports

RS232

RS485

Communication Protocols

CRS-ASCII	RS232 point-to-point and RS485 network
Modbus-RTU	RS232 point-to-point and RS485 network
Profibus-DP (On request)	Profibus-DP network
DeviceNet (On request)	CAN bus network

PROTECTION
Surge

According to directive | EN 61000-4-5

2kV between each input phase and PE. 1kV across each input phase combination.

Output Short Circuit

Type	Software
Programmed limit	25% of <i>I_{out_max}</i>
Detection time	1ms

Phase Loss

Type	Hardware	Software
Programmed limit	Half cycle	Adjustable via configuration parameter

Thermal Protection

With PTC on each module

FULL LOAD HARMONICS DISTORTION

Harmonic	Freq. (Hz)	Absorbed Current Distortions
3	150	-
5	250	< 22.5%
7	350	< 12.5%
9	450	-
11	550	< 11.0%
13	650	< 7.6%
17	850	< 8.0%
19	950	< 4.8%
THD		MAX 30%

