

QUASAR 500 is a line of switch-mode rectifiers for surface treatment processes, electro-winning and water treatment. CRS rectifiers use pulse width modulation (PWM) technique to control the current amplitude instead of the voltage. The result is a more accurate output current than other topologies.

Electrical Features

- > High speed IGBT technology
- > Modular power platform and multi-tower interconnection
- > Microprocessor control based
- > Up to 40% power saving versus Silicon Controlled Rectifier (SCR)
- > $\text{Cos } \varnothing = 1$
- > 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 170 cm height
- > 43 * 43 cm base size
- > Light weight
- > Main switch and operator panel in the front
- > All input/output connections in the back for easy access



Operator panel



Software Features

- > Simple waveform programming from the operator panel (output current, voltage, cycle time and ramp time)
- > Custom software available
- > Simultaneous current and voltage regulation
- > A/hr and A/min meters for precise thickness and solution-feed pumps control

Operation modes

- > Manual
- > Automatic (Via PC, PLC, Profibus-DP, DeviceNet, etc.)
- > Remote control

2 Year Warranty

		Most common applications	Output voltage (V) ¹	Max. output current per tower (A)	
				Air	Water
Direct Current	DC - Direct Current (forward)	Barrel process control Static method (jig) based processes Zinc alloy deposition Anodizing Hard anodizing Electro-winning Electro-polishing Electro-static painting Metal stripping	8 / 10 12 16 18 20 25 30 40 50 60 100	5000 5000 5000 4000 3200 3200 2600 2000 1500 1300 650	8000 6000 5000 4250 4000 3000 2500 2000 1500 1250 800
	DCR - Direct Current Reverse (forward and reverse)	Hard chroming Alkaline copper Electro-cleaning	8 / 10 / 16 / 18 / 20 / 25 / 30 / 40 / 50	8 power modules (including reverse units)	

¹ Standard voltages. Other values upon request. Please contact our technical center.

Technical Specifications
ELECTRICAL SPECIFICATIONS

Output	Power	DC type	Up to 400 kVA / 4 towers (Max. 8 power modules per tower)
		DCR type	1 tower (Max. 8 power modules - including reverse units)
	Voltage	DC type	From 8 to 100 V
		DCR type	From 8 to 50 V
	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		20 - 100% of max. voltage
	Current ripple	All config.	< 0.5% or < 3.5% of regulation range depending on output capacitors
		MINI (Config. 01)	< 2% of regulation range
	Efficiency		87% (typ.)
	Regulation speed (forward or reverse)	Software	10%-90% in 100 ms with 500 ms reverse dead time
Hardware		10%-90% in 20 ms with 500 ms reverse dead time	
Power Factor		> 93%	
Secondary withstand voltage		500 Vac, 1' between secondary and ground	
Input	Mains voltage		230 / 380 / 440 / 500 Vac +/- 10%
	Mains frequency		50/60 Hz
	Phase number		3
	Neutral		NOT USED
	Primary current		Max. 160 A per tower
	Leakage current		See EMC input filter specifications
	Primary withstand voltage		2000 Vac 50Hz, 1' between primary and secondary and primary and ground

GENERAL SPECIFICATIONS

Switching Technology		PWM IGBT	
Cooling Systems		Air / Water	
Operation Conditions	Location		Indoor use only
	Environment 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		<= 1000 m	
Configuration	Stand alone	DC and DCR type	
	Multi-tower	DC type	
Degree of Protection	Air cooled	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

Input Over Voltage

Software selectable

Surge

According to directive EN 61000-4-5

Programmed limit

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

Thermal Protection

With PTC on each module

Output Short Circuit

Type	Hardware	Software
Programmed limit	I _{out} max	25% of I _{out} max
Detection time	20 ms	100 ms

Phase Loss

Type	Hardware	Software
Programmed limit	Half cycle	Amplitude <10%

FULL LOAD HARMONICS DISTORTION

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

