



## HIGH AVAILABILITY

- Parallel for redundancy full kW range
- kVA=kW
- n+1, n+2
- Less stress on components
- Fewer components needed when paralleling four or less units
- Maintenance bypass switch

## INCREASED MANAGEABILITY

- Triple chassis included
- Software configurable features
- SNMP Ready for Manageability
- Intelligent Battery Management
- PowerChute Network shutdown
- Web based monitoring

## WORLD-CLASS SERVICE

- Turn-key solution - APC Service
- Consultants
- 7x24 Service
- 4 Global call centres
- 4-hour response available
- Award-winning customer service

## WARRANTY

- 1-year warranty
- Parts and Labour



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## 25 Years of 3-phase Experience

With the purchase of Silcon Power Electronics in 1998, APC acquired a superior 3-phase technology 25 years in the making. A manufacturer of traditional double-conversion 3-phase UPSs in the early seventies, Silcon evolved to a second generation single conversion architecture and then, in the late nineties, developed an even more efficient third generation Delta Conversion On-line™ technology. Today customers require a solution that combines the best of double conversion without the unpleasant and costly side effects of input harmonics. This makes the APC Silcon Series your new choice for a low cost/high efficiency 3-phase solution.



## APC delivers the new wave of 3-phase power protection

What makes a hot technology “hot”? In the eyes of an enterprise customer, “hot” means a technology that’s convenient and easy to use, and efficient and trouble-free to operate. A “hot” product is manufactured of high quality materials and as a result of its superior design, inherently carries a low cost of ownership.

All of these characteristics define APC’s Silcon Series Delta Conversion On-line machines. The unique architecture of the APC Silcon Series introduces a new category of power protection: the highly efficient 3-phase UPS.

Customers who install the APC Silcon Series immediately begin to realise benefits in the form of dramatic reductions in energy consumption costs, installation and wiring costs, air conditioning costs, harmonic distortion costs and maintenance costs. More importantly, the APC Silcon Series excel at their primary function: to supply clean 3-phase power to critical applications, datacentres and facilities regardless of power failures, sags, surges, brownouts, line noise, high voltage spikes, frequency variations and switching transients.

## A perfect fit for critical high-availability applications

High availability of systems is today a responsibility shared by both information systems departments and facilities departments. Industry statistics show unanticipated power events to be one of the main causes of unscheduled downtime. The unique design of the APC Silcon Series offer an elegant and inexpensive solution to customers who seek the peace of mind of redundant UPS systems. APC Silcon units configured in redundant mode can help eliminate the weak link of a substandard and unpredictable power supply.

## Backed by world-class service and support

The APC Silcon Series is designed to proactively identify and correct power problems to prevent downtime. APC’s Global Services Organisation will supplement your APC Silcon Series power protection solution with a world-wide network of trained personnel and automated support systems designed to quickly diagnose and resolve problems. A wide variety of installation, implementation and maintenance packages are available to meet any customer requirement.

# Features and benefits

## Availability

Customers can now enjoy the benefits of redundant UPSs by configuring and installing multiple 20kW units. For example, if kW requirements are high, up to 9 480kW UPSs can be paralleled to supply the load with the energy. Up to four units can be configured in parallel mode without requiring the installation of expensive external static switches.

## Advanced power management

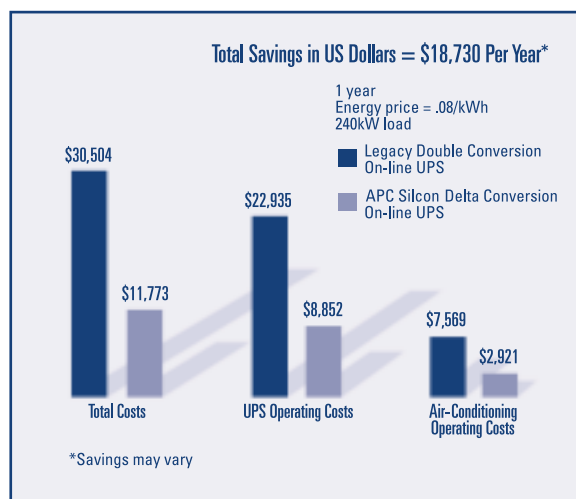
Silcon's intelligent control system can be programmed to maximise the overall efficiency of parallel Delta Conversion On-line systems. By designating as "active" only the systems needed to supply the load will be on-line, the other systems can be held in "stand-by" mode, ready to start up without interruption when required. Furthermore, to reduce stress and improve reliability, the load can be switched between the parallel systems in preprogrammed sequences.

## Lower cost of ownership

The APC Silcon Series is higher in efficiency than other on-line technologies. The Delta Conversion On-line units simply do not consume large quantities of energy and also produce much less heat. Customers need not oversize an air-conditioning unit to compensate for the heat loss which traditional UPSs generate.

## Lower installation cost

The APC Silcon Series has a power factor corrected input, ensuring that the input power factor is always one, regardless of load and utility voltage. A power factor of one minimises installation costs by requiring smaller cables and smaller fuses.

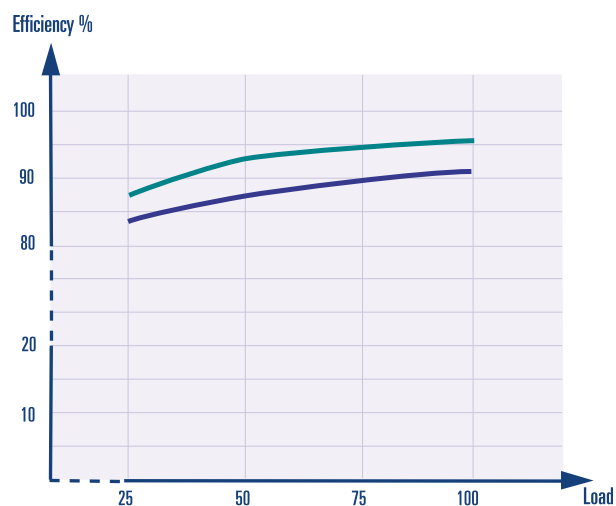


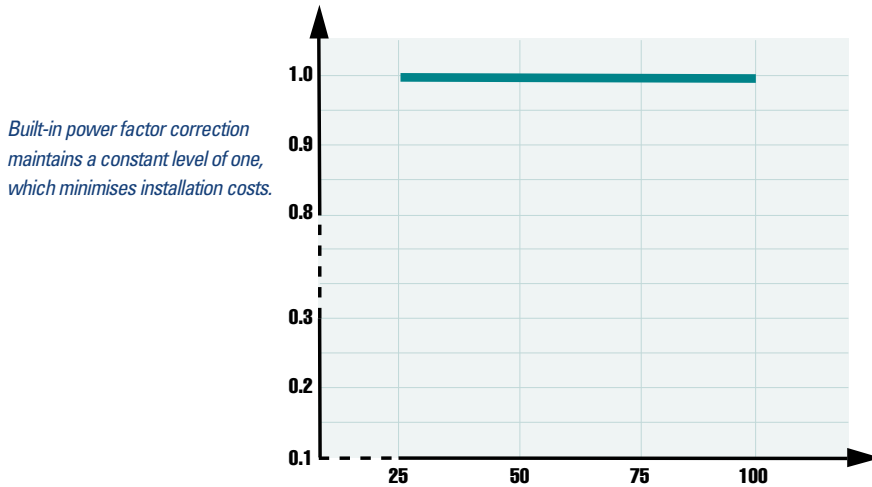
*Efficiency, environmental design and industry-leading technology make the APC Silcon Series the clear choice for enterprise power protection.*

## Additional savings

*Due to the high efficiency and the power factor corrected input, the APC Silcon Series requires smaller installation cables and fuses, and smaller air-condition systems.*

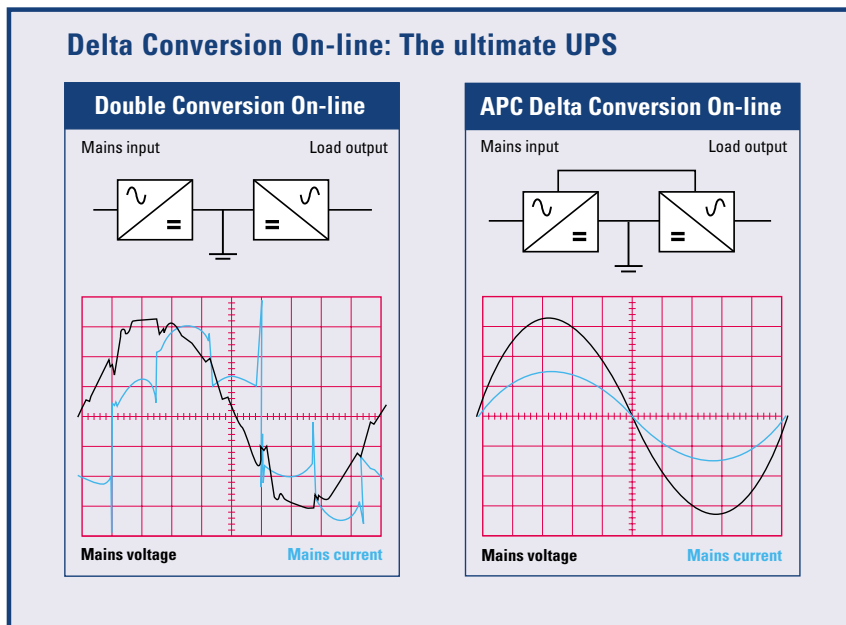
- APC Silcon Series
- Traditional UPS system





**Eliminates wear and tear on electrical infrastructure**

Utilities and power distributors are creating standards to limit the harmonic distortion produced by users. Violating these standards can be very costly. Many double-conversion 3-phase systems produce a level of harmonic distortion high enough to negatively impact the utility and its customers. To remedy the situation, customers are obliged to install large expensive filters. These filters further diminish the overall efficiency of the double-conversion machine. The Delta Conversion On-line technology, which maintains a sinusoidal utility current, eliminates this 3-phase double conversion topology problem.



**Compliant with power supplies, for the present and the future (kVA = kW)**

Over the past three years, more and more computer manufacturers have built Power Factor Corrected (PFC) power supplies into their servers. In order to avoid unnecessary wear and tear on computer components, the Volt-Amps (VA) requirements of all the computers that make up the load need to equal the Watts (W) capacity of the UPS.

The APC Silicon Series is PFC compliant without derating the unit. Double-conversion 3-phase UPS systems are not PFC compliant. Therefore, as more and more PFC computers enter into your datacentre, there is an increasing probability that the legacy double-conversion 3-phase UPSs become overloaded. With the APC Silicon Series, this problem is eliminated because the kVA rating of the unit equals the kW rating.

## Clear Channel Communications values APC Silcon reliability, service and support

**"The knowledge and support of Sterling Oakes Services, our APC Power Specialist, is a key to our uptime success."**

- **Phil Walter**, Data Centre Manager  
Clear Channel Communications

"Our current datacentre supports the corporate financial packages, Web site hosting servers, E-mail servers and ad servers for our radio station Web sites. Our ad servers distribute banner ads to our radio station Web sites and track the revenue from those ads. Downtime is not an option for us.

We contacted our APC Power Specialist, Jeffrey Oakes of Sterling Oakes Services, in Houston, Texas ([www.sterling-oakes.com](http://www.sterling-oakes.com)). After recommending the APC Silcon Series, Jeff then helped us to acquire and install the unit to support our datacentre. This highly efficient 3-phase solution is just what we needed. It provides us with an extremely clean, cool power source within a very small footprint. We had already installed a 20kW Generator and Automatic Transfer Switch that feeds two 2.5 ton single phase air conditioning units and approximately 11kW worth of critical load. The unique design topology of the APC Silcon unit presented us with a number of advantages. First, the unity power factor of the box eliminated the possibility of harmonic distortion impacting our load or back-feeding on the utility line. Second, the high efficiency of the machine could help us to significantly cut operational costs. And third, the APC Silcon Series is the only UPS that could reliably support our load in this type of application.

In the near future, we will be doubling the size of our server room. We are looking forward to purchasing two more APC Silcon UPSs. As we upgrade our radio, TV and outdoor sites, we will be looking for additional power protection solutions. We are confident that this investment will provide us with the clean reliable power we require as we go forward into the 21st Century."

## APC 3-phase: Solutions for both IT . . .



### IT professional:

Over the years, you have come to recognise APC as a reliability, manageability, and technology leader. As your requirements evolve and your business expands, APC is positioned to grow with you. APC power protection is available today to protect everything from laptop to data-centre to industrial facility.

... and facilities.

## Facilities professional:

For over 30 years, your 3-phase power protection choices have been limited. Low efficiency and high heat generated by double conversion have increased your operating costs. The Delta Conversion On-line technology offers you a reliable, efficient and low cost alternative.



## Why Motorola chose an APC Silcon UPS again

**"We provide our customers with a 24-hour quality software and service, and, with equal quality support from APC, we can maintain that round-the-clock quality service!"**

**- Thomas Moore, SystemSecurity Administrator, Motorola Cork, Ireland**

"Our facility requires a 24-hour service, and we therefore need a clean power supply. It is extremely vital for Motorola to maintain a 24-hour support and development centre, so we need a UPS system to maintain our network and our test laboratory."

"Our previous system was a APC Silcon 60kW unit which proved extremely reliable. We received very high maintenance and in-country support services, so we wanted to continue and chose APC again when we expanded our facility. The previous unit provided us with a clean power supply, and it is a very reliable and robust system."

"We did in fact evaluate and discuss two other solutions, but APC turned out to be the most efficient system."

"A UPS system has got to be efficient, it has got to be reliable, it has got to be available, and it has got to be robust – APC is all that."

"With our current load, we will have over an hour's back-up time from the APC system. In addition, we have a generator on site, so we have a continuous power backup. The generator will take over within a few seconds, but those seconds are very important. It is crucial to make sure that it takes over outright so as to guarantee an uninterrupted power supply."

"The feeling here is that we have become dependent on the UPS system, and so we expect a smooth transition during outages. The software engineers have become used to the standard of service that we offer them, and we have to maintain that with our APC Silcon UPS."

"APC provide a high standard of after-sales service. We have a number we can call 24-hours a day. We pay for a 24-hour maintenance, so whenever we call we receive an immediate response."

*The Network Solutions Sector facility in Cork, Ireland, develop and test telephone network software and provide a 24-hour customer service all over Europe, Asia, The Middle East and Africa. The Network Solutions Sector facility is the key to the Motorola's GSM and analogue technology in Europe and Asia. Over just a few years, the company have expanded their facility from employing 200 people to a present staff level of 500.*

# Accessories

## APC Power Accessories

### External Battery Solutions

External Battery Solutions are available when runtimes of 15 minutes or greater are required. Part numbers are assigned to the runtime which you need thereby eliminating any lengthy calculations.

### External Service Bypass Panel

The External Service Bypass Panel allows for the performance of proactive maintenance on the UPS without dropping the load. This prevents unwanted interruptions and maintenance technicians avoid overcurrent.

## APC Management Accessories

### PowerChute® Network Shutdown

PowerChute Network Shutdown allows safe shutdown of servers, notification of end-users, running command files and logging of events. This shutdown software is available for a variety of operating systems including Windows NT, NetWare, HP-UX, Linux, Solaris, and others.

### Web/SNMP Management Card

The APC Silicon Web/SNMP Card allows monitoring of the APC Silicon Series from any Web browser. The UPS can also be monitored via Telnet, SNMP (NMS Management Scheme), and the Web.

### MasterSwitch™

The MasterSwitch network power controller can easily reboot remote servers, internetworking equipment, or banks of modems to prevent on-site service calls. MasterSwitch allows remote control of up to eight (8) independent power channels.

### Out-of-band Management Card

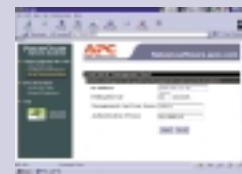
The Out-of-band Management Card provides remote access to detailed UPS information, gives you remote paging upon power events, and remote safe reboot of attached equipment via user-supplied modems. Users have the ability to communicate with the UPS even during power outages or when the server is down. The out-of-band management card allows remote power management via serial or modem link.

### Environmental Monitoring Card

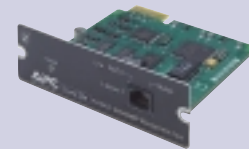
The Environmental Monitoring Card will remotely monitor temperature, humidity, and other environmental conditions via PowerChute *plus* software, Out-of-band management card, Web/SNMP Management Card, or SNMP Agents.



*External Service Bypass Panel*



*PowerChute Network Shutdown graphical user interface*



*Web SNMP Management Card*



*MasterSwitch*



*Out-of-band Management Card*



*Environmental Monitoring Card*

## 7 x 24 Global Support

Our APC Power Quality Engineers, Power Specialists, High Power Partners, and Professional Services personnel guarantee complete satisfaction with any APC service. When it comes to power management, our customers deserve the Legendary Reliability™ and peace of mind that only APC Global Services can provide.

### Start-UP Service

APC's Start-UP Service provides APC authorised service personnel on site to confirm proper wiring of installation, power-up the APC hardware, and system training. Labour and travel expenses are included in this program. Standard service is offered during normal business hours, excluding holidays.

### Annual Maintenance Program

For customers with APC Silcon 3-phase systems installed, it is recommended that an annual maintenance service contract be considered. APC's service policy is to prevent potential problems from occurring. The 3-phase systems contain components and parts which will wear out over time. It is important that only specially trained staff, who are familiar with the inner workings of the APC Silcon 3-phase machines do the maintenance work. These parts must be checked regularly and replaced when appropriate. Regular maintenance helps our customers to avoid unnecessary downtime.

Under the Annual Maintenance Program APC guarantees next business day on-site repair service and delivery of spare parts for all APC UPS and Power Array™ systems, a thorough annual inspection and test of the system, and 7 x 24 telephone technical support. This service contract assures that your APC hardware solution is always in working condition to protect your critical applications against power failure. Contracts are renewed yearly and include all parts, batteries (internal only), labour and travel expenses.

### Remote Monitoring Service

APC's Remote Monitoring Service is an outsourced remote monitoring solution that proactively monitors UPSs and the surrounding environment 7 x 24 to enhance high availability in networking and facilities environments. With the ability to uniquely profile each customer, APC is able to spontaneously react during UPS events in the same manner that your systems personnel would.



# Specifications

General Specifications						
Static bypass switch	Built-in					
Communication Interface	Built-in					
Backfeed protection	Built-in (only for 10-80kW)					
Parallel operation board	Built-in					
Terminals for external batteries	Built-in (only SL10KH, SL20KH, SL40KH, SL60KH, SL80KH, SL120KH, SL160KH, SL240KH, SL320KH, SL480KH)					
Alarm relay board	Built-in (only SL120KH, SL160KH, SL240KH, SL320KH, SL480KH)					
Ambient temperature	0-40°C (Above 25° C the battery life time is reduced)					
Humidity	Max 95%, non-condensing					
Protection class	IP30					
Safety	EN50091-1, UL 1778					
Emission and Immunity	EN50091-2					
Approvals	ISO9001, ISO14001, C-tick					
Advanced Batt. Monitoring	Programmable					
Auto restart	Programmable					
Options	IP31					
Power accessories	Isolation Transformer Module, Service Bypass Panel (line up and match), Remote Display Unit, External Battery Cabinet (line up and match), External Static Bypass Switch					
Management accessories	PowerChute Network Shutdown, Web/SNMP Management Card, MasterSwitch™, Environmental Monitoring Card, Out-of-band Management Card					
Input and Output Specifications						
Input voltage	3x380/400/415V					
Input operation tolerance	±15%					
Input bypass tolerance	±10% (standard), ±4, 6, 8% (programmable)					
Input frequency	50Hz (standard) ±0.5-8% (programmable)					
Input PF	load 25% min. 0.97, load 100% min.99					
Output voltage	3x380/400/415V					
Voltage tolerance	±1% static, sym. load, ±3% static, asym. load, ±5% 1-100% load step					
Voltage distortion	max 3%, linear load, max 5%, non-linear load					
Load power factor	0.9 lead to 0.8 lag					
Output frequency	50Hz (mains synchronised) ±0.1% free running					
Overload capacity	Mains operation 200% - 60 secs; Mains operation 125% - 10 mins.; Battery operation 150% - 30 secs.; Bypass operation 125% - cont., 1000% - 500ms					
Type	SL10KH SL10KHB0 SL10KHB1 <sup>1</sup> SL10KHB2 <sup>2</sup>	SL20KH SL20KHB0 SL20KHB1 <sup>1</sup> SL20KHB2 <sup>2</sup>	SL40KH	SL40KHB0 SL40KHB2 <sup>3</sup>	SL60KH	SL80KH
Output power	10kW/10kVA	20kW/20kVA	40kW/40kVA	40kW/40kVA	60kW/60kVA	80kW/80kVA
Full load output current	14.5A	29.0A	57.7A	57.7A	87A	115A
Max input current	18.9A	37.6A	74.7A	74.7A	112A	147A
Efficiency AC to AC 100% load	94.8%	95.5%	96.5%	96.5%	96.1%	96.5
50% load	92.6%	93.3%	95.1%	95.1%	93.3%	94.8%
Heat dissipation, nominal load	0.5kW	0.9kW	1.5kW	1.5kW	2.4kW	2.4kW
Audible noise	52dB(A)	52dB(A)	55dB(A)	55dB(A)	60dB(A)	60dB(A)
Height	1400 mm	1400 mm	1400 mm	1400 mm	1400 mm	1400 mm
Width	600 mm	600 mm	600 mm	1000 mm	800 mm	800 mm
Depth	800 mm	800 mm	800 mm	800 mm	800 mm	800 mm
Weight	192 kg	212 kg	272 kg	365 kg	440 kg	447 kg
Type	SL120KH	SL160KH	SL240KH	SL320KHB2	SL480KH	
Output power	120kW/120kVA	160kW/160kVA	240kW/240kVA	320kW/320kVA	480kW/480kVA	
Full load output current	173A	231A	346A	462A	693A	
Max input current	219A	293A	450A	582A	874A	
Efficiency AC to AC 100% load	95.8%	96.3%	96.3%	96.8%	96.8%	
50% load	92.3%	93.6%	92.9%	94.3%	95.0%	
Heat dissipation, nominal load	5.3kW	6.2kW	9.2kW	10.6kW	15.9kW	
Audible noise	71.5dB(A)	71.5dB(A)	71.5dB(A)	71.5dB(A)	73.0dB(A)	
Height	1800 mm	1800 mm	1800 mm	1800 mm	1800 mm	
Width	1125 mm	1125 mm	1600 mm	1600 mm	1900 mm	
Depth	800 mm	800 mm	800 mm	800 mm	800 mm	
Weight	800 kg	800 kg	1400 kg	1400 kg	1800 kg	

<sup>1</sup> Unit with one internal battery (add 169 kg to the weight of the SL10KH/SL20KH unit)

<sup>2</sup> Unit with two internal batteries (add 368 kg to the weight of the SL10KH/SL20KH unit)

<sup>3</sup> Unit with two internal batteries (add 404 kg to the weight of the SL40KH unit)



APC Battery Breaker Box/APC Fuse Box										
General specifications				Dimensions (HxWxD)						
Current range	25 - 800A DC			10kW-160kW			540 x 540 x183			
Max. voltage	2x488V DC			240kW-480kW			1035 x 835 x 300 mm			
Enclosure	Box of fibre glass reinforced polyester									
Protection Class	IP42			Cable entries			Top			
Colour	Grey			APC Silcon UPS			Bottom			
Mounting	Wall									
				Weight						
				10kW-160kW			20 kg			
				240kW-480kW			100 kg			
Used with	10kW	20kW	40kW	60kW	80kW	120kW	160kW	240kW	320kW	480kW
Amp. rating	25A	50A	63A	125A	125A	200A	250A	400A	500A	800A
Connection cable	4 mm <sup>2</sup>	10 mm <sup>2</sup>	16 mm <sup>2</sup>	50 mm <sup>2</sup>	50 mm <sup>2</sup>	95 mm <sup>2</sup>	150 mm <sup>2</sup>	2//95 mm <sup>2</sup>	2//150 mm <sup>2</sup>	3//150 mm <sup>2</sup>
Max. short circuit current	10kA	10kA	20kA	20kA	20kA	20kA	20kA	40kA	40kA	40kA

## High Availability on Wheels

Facilities and consulting electrical engineers can now view the latest in UPS technology without being out of reach for their own customers.

The APC Mobile Availability Center (MAC) is a travelling training and demonstration laboratory. The APC MAC is designed to assist IT and facilities professionals in identifying appropriate solutions to increase power availability. Inside there are a broad selection of APC power protection and management solutions – such as APC's Silcon series, Symmetra® Power Array™, and the newest Smart-UPS® solutions. Also a variety of accessories and UPS management software, that increase the availability of essential business processes, can be tried out by the customer.

The APC MAC is equipped to seat visitors in a classroom style setting. An APC application engineer will conduct presentations and lead attendees in question and answer sessions. The APC MAC presentation includes a number of product demonstrations focused on promoting power and systems availability of datacentres and facilities. This travelling road show reinforces APC's commitment to partner with its customers to help ensure that the total solution effectively addresses the customer's availability needs.



Go to the Web for more information about the APC Silcon Series at [www.apcc.com/products/silcon/](http://www.apcc.com/products/silcon/) for in-depth information, Silcon video, and Installation and User guides (available for download in pdf format).



APC Silcon is certified by ISO9001 (Quality standards), and by ISO14001 (Environmental standards).



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APC's quality system is certified by ISO 9002 standards



**APC**  
Legendary Reliability™