SINEXCEL

Auto-Fine Tuning THDi

<5%

Peak efficiency

>99%

Sinexcel
Ultra AHF

Active Harmonic Filter

New Beginning, New Power Quality Compensation Era

SINEXCEL Ultra Series

Active Harmonic Filter

The revolutionary SiC Mosfet technology has driven the design optimization of power quality products, which delivering unparalleled improvements in performance and application of Sinexcel Ultra Series. This transformation has reshaped the business model for power quality solutions, setting a new industry benchmark for excellence.

Performance breakthrough brought by SiC technology

99%
Ultra high efficiency

97%
Enormous harmonic compensation rate

≥27kg
Tiny dimension but huge capacity

Industry application breakthrough brought by Ultra Series

- Flexbile Top-Vent Cabinet
- Potting Protection
- Automatic fine-tuning
- Resonance suppression
- THDu mitigation
- Package PQ solution
- Easy Maintenance

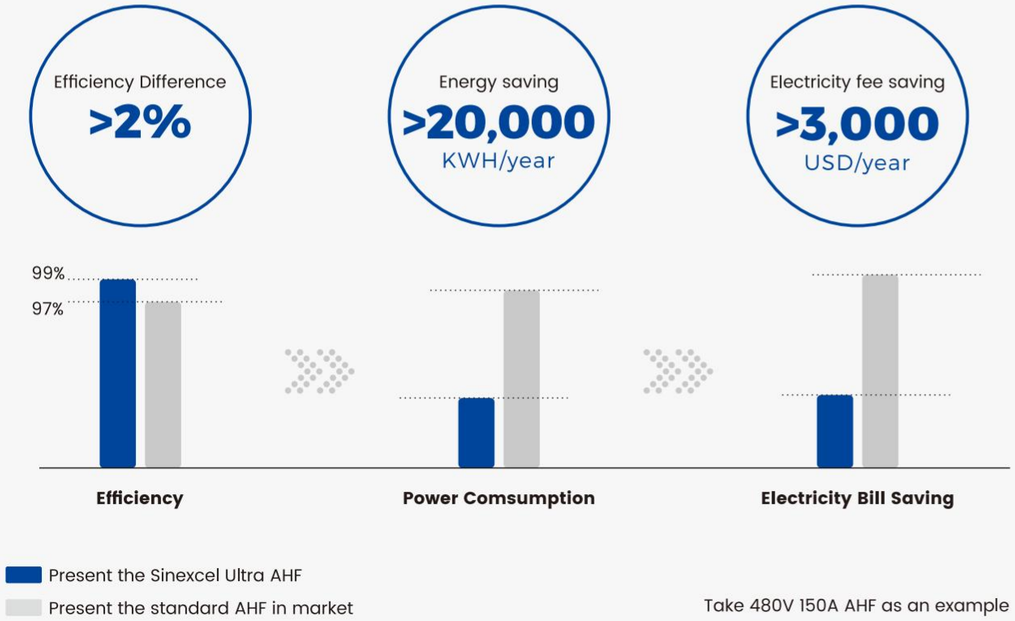
Ultra high efficiency

__Performance breakthrough brought by SiC technology

Silicon carbide (SiC) MOSFETs achieve ultra-high efficiency primarily due to their wide bandgap, which leads to lower on-state resistance (Rds(on)), faster switching speeds, and reduced switching losses. These properties enable SiC MOSFETs to operate at higher frequencies and temperatures with improved overall performance, resulting in more efficient power conversion systems.

What benefit will be brought to user with 99% ultra high efficiency?

——**Electricity bill saving, higher ROI**



Take 480V 150A AHF as an example

Enormous harmonic compensation rate

__Performance breakthrough brought by SiC technology

SiC technology brings much higher switching frequecncy (the average of 40KHz and maximum up to 95KHz) to Ultra Series AHF. With the high switching frequency and Sinexcel unique algorithm design, Ultra Series AHF realizes the enormous harmonic compensate rate.

(Before compensation)

>97%

Harmonic compensation rate

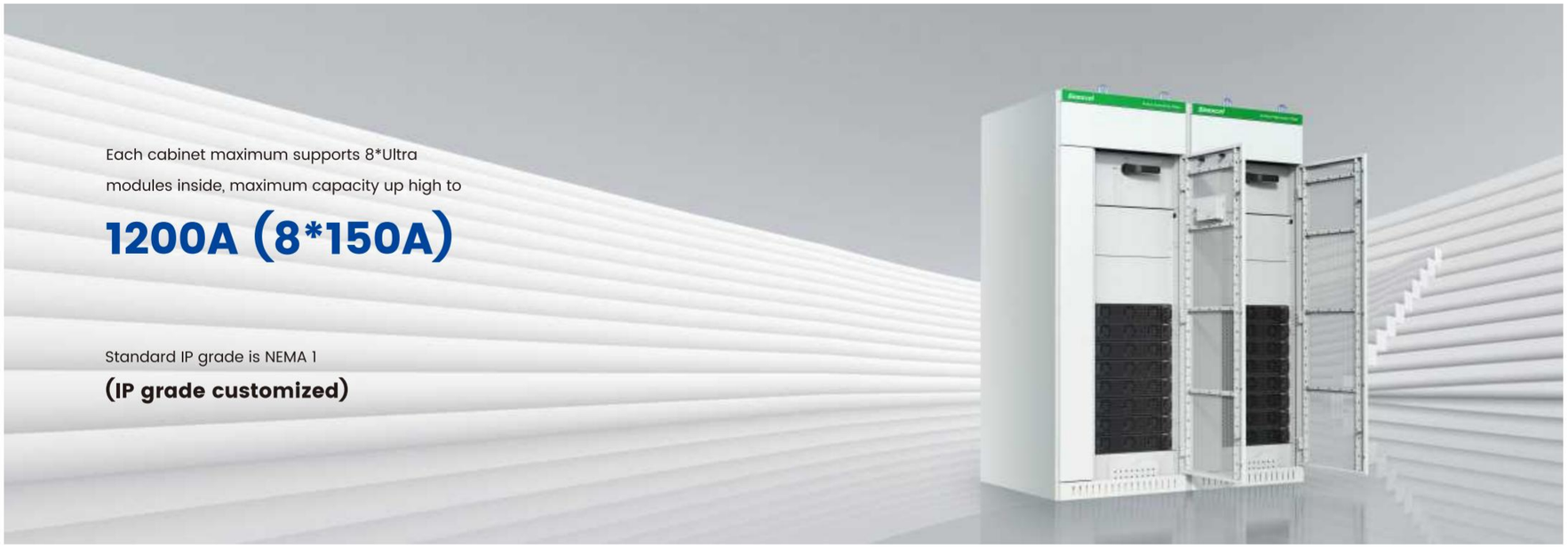
>95%

High harmonic compensation rate (31st~51st)

(After compensation)

>95%

Even harmonic compensation rate



Sinexcel Ultra Series available now

480V Ultra AHF 150A
Size only
19.7"W*24.4"D*3.9"H

480V Ultra AHF 100A
Size only
19.7"W*20.9"D*3.5"H

Tiny dimension but huge capacity

Performance breakthrough brought by SiC technology

High heat resistance, high thermal conductivity, and high switching frequency, these advantages of SiC bring lower heat dissipation and less ripple current output to Ultra Series AHF. With the physical upgrade of this key component and the 3-year deep research of the R&D team, Sinexcel realizes the ultra-high integration design in Ultra Series AHF

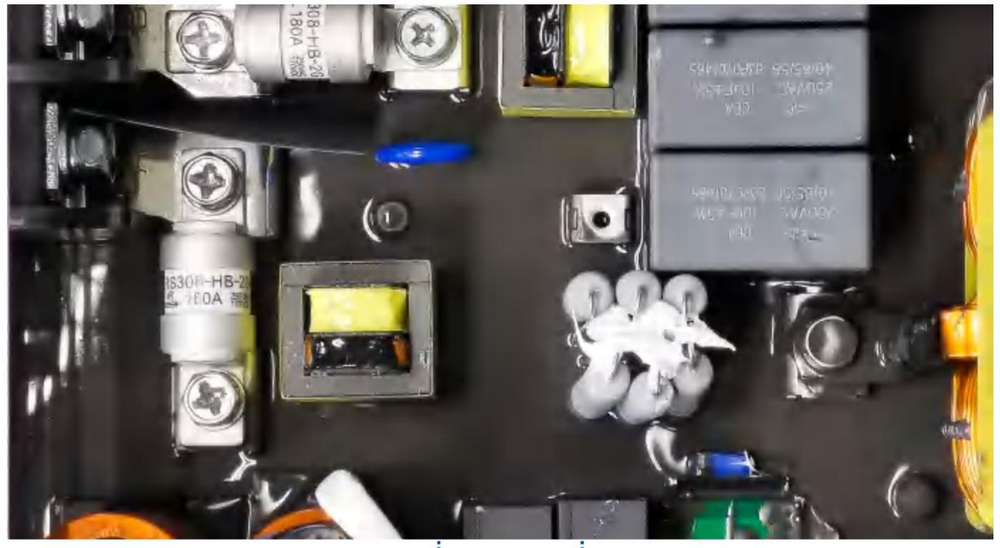
Flexbile Top-Vent Cabinet

__Industry application breakthrough brought by Ultra Series

High power density cabinet that can be installed against the wall, space saving for distribution room

Size optional, cabinet capacity optional and IP class optional

Collapsible design, small packing size, cost-effective for transportation



Potting Protection

__Industry application breakthrough brought by Ultra Series

Special glue is used inside the Ultra Series AHF, and brings better anti-corrosion and anti-conductive dust performance. This makes the Ultra Series AHF able to survive in harsh environments and increase its lifespan.

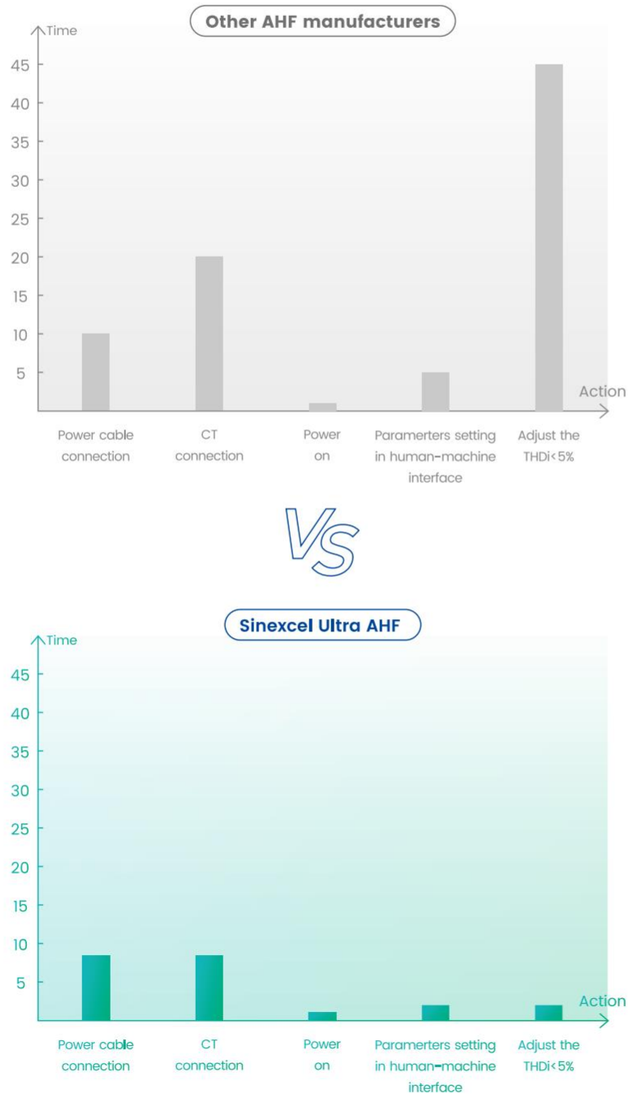
Automatic fine-tuning

__Industry application breakthrough brought by Ultra Series

Sinexcel Ultra Series AHF updates the software algorithm and when CTs are at the source side, this makes the AHF realizes the closed-loop design; The unique algorithm can automatically identify and correct the compensation output result, and the process without manual adjustment.

The automatic fine-tuning realizes automatic adjusts THDi<5% and the whole process can be completed within one minute;

Easy software operation, and simple hardware installation. Only power cables and a set of CT to set up Ultra Series AHF. The Automatic fine-tuning function realizes intelligent and excellent compensation effects, bringing users a simple and efficient commissioning experience.



Resonance suppression

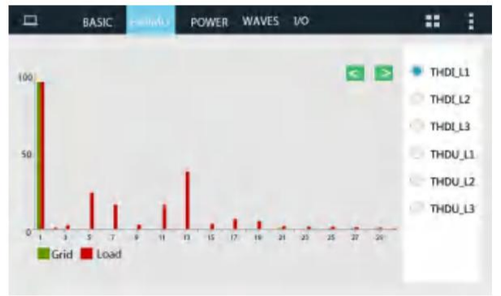
__Industry application breakthrough brought by Ultra Series

—Unique Intelligent Fourier Technology

In the process of solving power quality problems, how to solve the resonance is the direction that the industry has been focusing on; when the system resonates, it will generate a voltage several times higher than the power supply. And will be applied in the capacitors, transformers, circuit breakers, and other equipment in the circuit, even causing insulation damage to high-voltage electrical equipment;

Vs

Since 2017, Sinexcel had designed resonance suppression by the unique intelligent Fast Fourier Technology and had been the industry-leading in resonance suppression technology. This technology ensures the normal and stable operation of the system and avoids the harm of resonance for the user.



After compensation

In 2022, after several years of persistent research and development, Sinexcel's R&D team launched the resonance algorithm 2.0. Based on resonance suppression, it broke through resonance compensation, achieved the requirement of **THDi<5%**, output perfect sine waves, and brought excellent power quality for the user.

THDu mitigation

__Industry application breakthrough brought by Ultra Series

Extreme voltage distortion can cause multiple zero crossings for the voltage wave. For equipment where proper sequencing of operations depends on a zero crossing for timing, voltage distortion can cause misoperation. And 5th harmonic voltage distortion can cause serious problems for 3-phase motors.

Sinexcel Ultra Series AHF through the development of the voltage detection circuit to realize THDu compensation.

And re-designed the hardware, successful to achieve the zero CT to compensate THDu!!!

Material saving

Simple operation

Excellent performance

More optional for user

More suitable for reconstruction projects

Package PQ solution

__Industry application breakthrough brought by Ultra Series

Module hybrid application

A more economical power quality solution, AHF compensates harmonic, and SVG compensates reactive power at same time

Sinexcel Ultra AHF Specifiction—400V

Items	Sinexcel Ultra Series AHF					
Rating	25/35A	50/60A	75A	100A	150A	300A
Function	Harmonic, reactive power and three-phase unbalance compensation					
System parameters						
Nominal voltage	380/400/415V (228-456V)					
L-N voltage	220/230/240V (132-264V)					
Nominal frequence	50/60Hz, auto sensing (Range : 45Hz~62.5Hz)					
Parallel quantities	Unlimited					
Efficiency	99%					98.5%
Connection type	3 Phase 3 Wire / 3 Phase 4 Wire					
CT location	Load / Supply side					
Performance indicators						
Control algorithm	FFT, intelligent FFT, and instantaneous reactive power					
Compensation Order	2nd to 50th, selectable for each order, amplitude ajustment					
Advanced control algorithm	Resonance suppression, compensation performance software auto-tuning, no CT connection for THDu compensation					
Compensation rate	> 97%					
Even harmonic compensation rate	> 97%					> 95%
Zero-Sequence compensation rate	3 times capacity compensated, >97%.					
Fast response Time	< 50us					
Full response Time	< 5ms					
Target power factor	Adjustable from -1 to +1					
Switching frequency	Average 40kHz,up to 95kHz					
Cooling air requirement	180CFM		165CFM	240CFM		480CFM
Noise level	<60dB (Full load)		<60dB (Full load)	<65dB (Full load)		<68dB (Full load)
Communications ports	RS485 and Ethernet port(RJ45)					
Communications protocols	Modbus RTU, TCP/IP					
Module display interface	4.3-inch HMI(module), 7-inch HMI(central monitor) and LED					
Protection functions	Over-voltage protection, under-voltage protection, inverter bridge inverse protection, over-compensation protection and so on					
Mounting type	Wall-mounted, Rack-mounted and Cabinet					
Dimensions(W x D x H mm)	500*470*88		500*520*88	500*520*100		500*646*220
Net weight	17kg		18kg	25kg		50kg
Storage temperature	-40°C~70°C					
Operating Ambient temperature	-10°C~40°C (may derate capacity if ambient temperature exceeds 40°C)					
Relative humidity	5% to 95%, non-condensing					
Altitude	1500m, 1500-4000m, capacity is derating 1% for every 100m altitude increased.					
protection class	IP20 (IP degree can be customizable)					
Qualifications	CE (400V type AHF); ETL (Compatible 380~480V type AHF)					CE (400V type AHF)

Sinexcel Ultra AHF Specifiction–480V

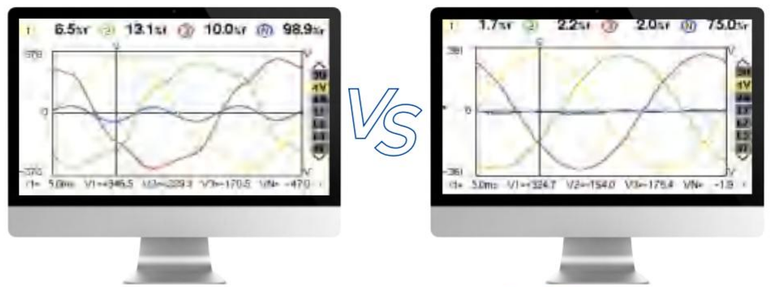
Items	Sinexcel Ultra Series AHF					
Rating	25/35A	50/60A	75A	100A	125/150A	300A
Function	Harmonic, reactive power and three-phase unbalance compensation					
	System parameters					
Nominal voltage	480V(384V~528V, -20%~10%)					
Nominal frequence	50/60Hz, Auto sensing(Range:45Hz~62.5Hz)					
Parallel quantities	Unlimited					
Efficiency	99%					98.5%
Connection type	3 Phase 3 Wire , can't support 3P4W					
CT location	Load / Supply side, close loop sampling					
	Performance indicators					
Control algorithm	FFT, intelligent FFT, and instantaneous reactive power					
Compensation Order	2nd to 50th, selectable for each order, amplitude ajustment					
Advanced control algorithm	Resonance suppression, compensation performance software auto-tuning, no CT connection for THDu compensation					
Compensation rate	> 97%					
Even harmonic compensation rate	>97%					>97%
Zero-Sequence compensation rate	3 times capacity compensated, >97%.					
Fast response Time	< 50us					
Full response Time	< 15ms					
Target power factor	Adjustable from -1 to +1					
Switching frequency	Average 40kHz,up to 95kHz					
Cooling air requirement	240CFM		275CFM		310CFM	600CFM
Noise level	<56dB (Full load)				<60dB(Full load)	<64dB(Full load)
Communications ports	RS485 and Ethernet port(RJ45)					
Communications protocols	Modbus RTU, TCP/IP					
Module display interface	4.3-inch HMI(module), 7-inch HMI(central monitor) and LED					
Protection functions	Over-voltage protection, under-voltage protection, inverter bridge inverse protection, over-compensation protection and so on					
Mounting type	Wall-mounted, Rack-mounted and Cabinet					Wall-mounted and Rack-mounted
Dimensions(W x D x H mm)	500*470*88		500*520*88		500*520*100	500*600*220
Net weight	18kg		25kg		30kg	60kg
Storage temperature	-40°C~70°C					
Operating Ambient temperature	-10°C~50°C (will derate capacity if ambient temperature exceeds 40°C)					
Relative humidity	5% to 95%, non-condensing					
Altitude	⩽1500m, 1500-4000m, capacity is derating 1% for every 100m altitude increased.					
Protection class	IP20 (IP grade can be customizable)					
Certificate	CE					

APAC

China·Beijing Winter Olympics

The Nest-type Beijing Olympic Stadium located on Beijing's Olympic Green and built for the 2008 Summer Olympics. It hosted the Opening and Closing Ceremonies of the Beijing 2022 Olympic Winter Games and has become a symbol of modern architecture in China. Sinexcel products were used to optimize power quality in advance of the Winter Olympics. Sinexcel's products ensure that the equipment on site performs well. We are proud that the country chose our products to ensure power quality at the Olympic venues, which is a high level of recognition of Sinexcel's products' quality, merit and service.

In order to create a beautiful lighting and dancing effect for the opening and closing ceremonies, the power distribution system in the stadium distributed a large number of large-scale LED screens, stage lights, lifting screens, frequency converters and other non-linear loads. Such non-linear loads will inject much harmonics into the power system when they are in normal operations that result in an increase in the system bus voltage distortion rate, with a maximum value of 13%, far exceeding the China power quality standard "GB/T14549-93" on related systems, voltage distortion rate <5% requirement.



Before THDu governance

After THDu governance

Before spectrogram compensation

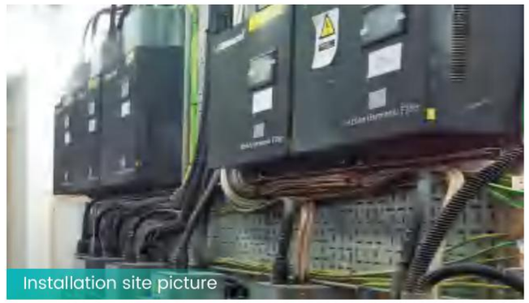
After spectrogram compensation

Installation site picture

Long-term operation of the equipment in a high THDu (Total Voltage Distortion Rate) electrical environment will interfere with the normal operation of the equipment, even cause equipment damaged. In order to build a clean voltage environment for the electricity loads and ensure the normal stage lighting effect of the opening and closing ceremonies, Sinexcel Co., Ltd. installed a total of 5200A Active Harmonic Filters in the Bird's Nest Club for harmonic governance.

HongKong China·Queen Mary Hospital

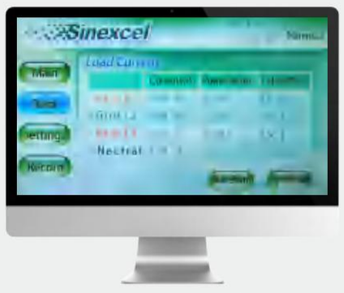
Queen Mary Hospital is a renowned medical institution in Hong Kong. It is one of the major hospitals under the management of Hong Kong West Cluster, which is part of the Hospital Authority of Hong Kong. Queen Mary Hospital is renowned for its excellence in healthcare services, medical research and teaching. Sinexcel's power quality solutions ensure equipment reliability, improve the efficiency and effectiveness of hospital operations, reduce energy waste and lower overall operating costs.


Installation site picture

Singapore·Marina Bay Financial Center Tower

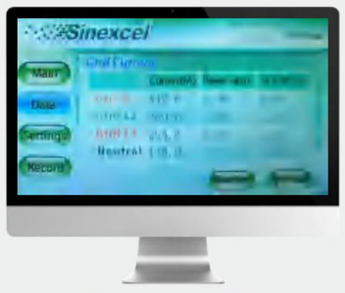
Marina Bay Financial Center Tower. It is a prominent skyscraper located in the Marina Bay area of Singapore's central business district. The presence of these prestigious companies contributes to the Tower's reputation as a prestigious business address. It's renowned for its iconic architecture, its role as a premier business hub, its world-class facilities and its strategic location in one of Singapore's most dynamic and vibrant areas. Sinexcel's power quality solutions minimize and power interruptions and ensure a stable power supply, thus supporting business efficiency and data security.


Installation site picture



Before compensation

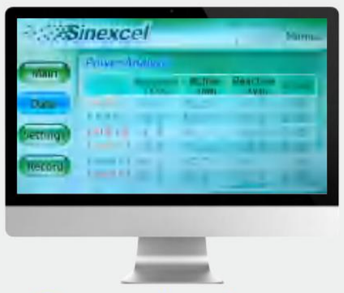
Vs



After compensation

THDi compensation performance

Vs



PF compensation performance

Japan·NTT Global Data Centers

It is a well-known global provider of data center solutions and services. With locations in North America, Europe, Asia and elsewhere, NTT Global Data Centers provides businesses with a reliable and secure infrastructure for storing, managing and processing data, so there are stringent requirements for power quality to ensure data center reliability, equipment performance and longevity, and to provide an efficient operating environment and security. This drove the partnership between NTT and Sinexcel, and our products met their high requirements.

Before we power on the AHF, the load powel quality so poor that the PF only

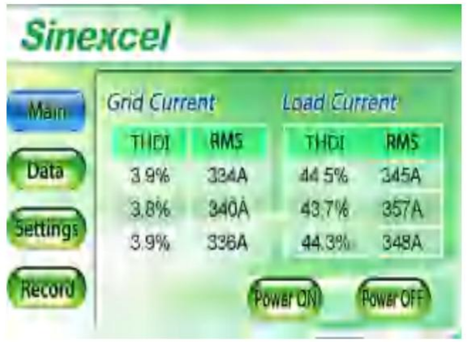
0.28

After power on AHF that the PF up to

0.98


Installation site picture

Malaysia·Prime Minister's Department



The Prime Minister's Office, established in 1997, is located on the hilltop of Putrajaya and consists of the Prime Minister's Office, the Deputy Prime Minister's Office and more than fifty other government agencies and entities. Government departments often rely on a variety of electronic systems, equipment and data centers to perform their functions, and Sinexcel's power quality products provide a stable and high-quality power supply to ensure uninterrupted operation of the power system and protect the integrity and security of critical government data.. After installing Sinexcel's Active Harmonic Filter (Abbreviation as AHF in after) , the THDi reduced from 43.7% to 3.8%.

THDi 43.7% → THDi 3.8%

EMEA

UAE·Port of DUBAI

The Port of Dubai, also known as Jebel Ali Port, located on the northeastern coast of the UAE, it is the largest port in the UAE and one of the most important container ports in the world. The port has state-of-the-art container handling equipment to provide efficient container handling and transshipment services. The port relies on a variety of sophisticated equipment including cranes, container handling machinery and control systems that are highly sensitive to power quality. That's why they chose Sinexcel products to manage power quality, with good results.

UAE·Port of DUBAI

The Hungarian State Opera House, located in Budapest, Hungary, is one of the most famous opera houses in the world and an outstanding example of Neo-Renaissance architecture. It is a World Heritage Site recognized by UNESCO. Its architectural significance and historical value make it not only a prestigious cultural institution but also an important landmark in Budapest. Its performance equipment, acoustic factors, lighting and staging, data and control systems, as well as the preservation of its artistic assets, place high demands on the quality of electrical energy.

Installation site picture

Turkey·Ministry of Health of Turkey

Turkey has become a popular destination for medical tourism, attracting thousands of visitors from around the world in search of high-quality and affordable healthcare services. And it's famous for its efforts in promoting universal healthcare, developing medical tourism, managing the COVID-19 pandemic, investing in healthcare infrastructure and recognizing the value of traditional medicine. Sinexcel's power quality solutions ensure uninterrupted healthcare services and a safe healthcare environment.

TURKEY

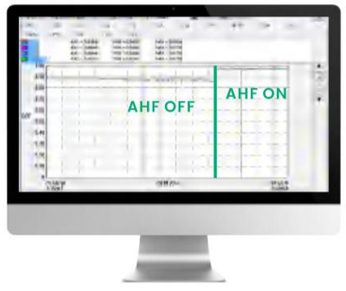
Americas

USA·LP SmartSide Trim & Siding

LP SmartSide Trim & Siding is a popular brand of engineered wood siding and trim products. LP is committed to being the leading building solutions company, providing an innovative and sustainable portfolio of quality products that help customers build beautiful, durable homes and buildings. A large number of equipment such as stamping presses, spot welders, coating machines, and assembly line automation machines are used in the manufacturing process. These equipments have a commonality that the load fluctuation is large, fluctuation is fast, the harmonic occurrence is large, causing the serious problem of low power factor. However, the traditional reactive power compensation devices installed cannot operate properly and the reactive power problem cannot be solved. That's why they chose Sinexcel's power quality solutions. Sinexcel products ensure that manufacturing processes run smoothly and efficiently, maintain product quality and consistency, and protect valuable assets.

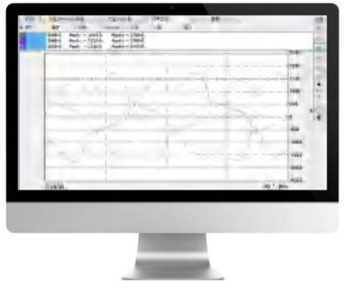
Cannada·Serafina Oil&Gas

Serafina Energy Ltd. is an oil and gas company. The Company provides geophysical, geological and other oil and gas exploration services and is focused on the development of conventional heavy oil and thermal heavy oil assets. Sinexcel Power Quality solutions for the oil and gas industry increase equipment reliability, ensure safety, maintain data integrity and control system performance, reduce risk and improve operational efficiency, while also reducing environmental impact.



Power factor compensation

THDi compensation



Current waveform before compensation

Vs

Current waveform after compensation

Canada·HyLife Canada's leading pork producer

HyLife is a vertically integrated company involved in various aspects of the pork industry, including hog production, processing, and international distribution. With an extensive network of hog farms and state-of-the-art processing facilities, HyLife provides high-quality pork products to domestic and global customers. Sinexcel's harmonic management and voltage regulation features help reduce energy waste and overall operating costs, improve the efficiency and consistency of production operations, and ensure the quality of the food produced.

Case Study Photo Gallery

Installation site picture

Installation site picture