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SFERE,ELECTRIC
APPLICATION SOLUTION EXPERT

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SFR-APF

SFERE ELECTRIC

ELECTRIC APPLICATION SOLUTION EXPERT

2021

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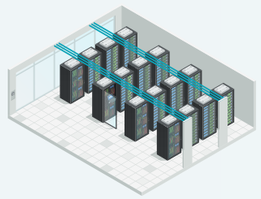
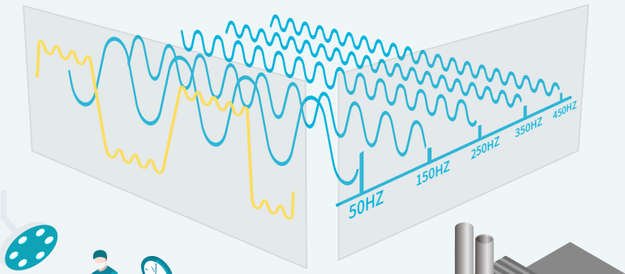
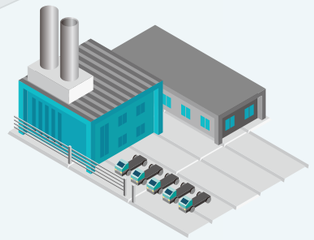
BACKGROUND

As great amount of the nonlinear load was applied in the power system,the harmonic distortion accounts a big proportion of the grid. It increased the line loss of the power supply and interfered the running of the protection devices of the power substation and automation devices of the industrial control system.

HARMONIC DISTORTION







The increase in power energy productivity has improved living standards, and most of the electrical loads used in the intelligent power consumption are nonlinear nowadays. Harmonic current is generated by these nonlinear loads, and is formed by the superposition of countless sinusoidal currents whose frequencies are integer multiples of the fundamental current. When all the waveforms are superimposed, they will become distorted waveforms.

BRIEF INTRODUCTION

SFR-APF active power filter is a new type of power quality improvement production for dynamically filtering harmonics and compensating reactive power. It can filtering and compensate harmonic (variable in orders and frequency) and dynamic reactive power in real time. It is used to overcome the shortcomings of conventional harmonic suppression and reactive power compensation methods such as passive harmonic filters, and achieve the harmonic filtering function and reactive power compensation function of the system. SFR-APF is widely used in power, metallurgy, petroleum, port, chemical industry and industrial and mining enterprises.

THE BENEFITS OF HARMONIC CONTROL

COST REDUCTION 01

Prolong the use life of equipment and reduce the investment for equipment.

STABLE PRODUCTION 02

Maintain the normal operation of equipment and stable production.

ENERGY EFFICIENCY 03

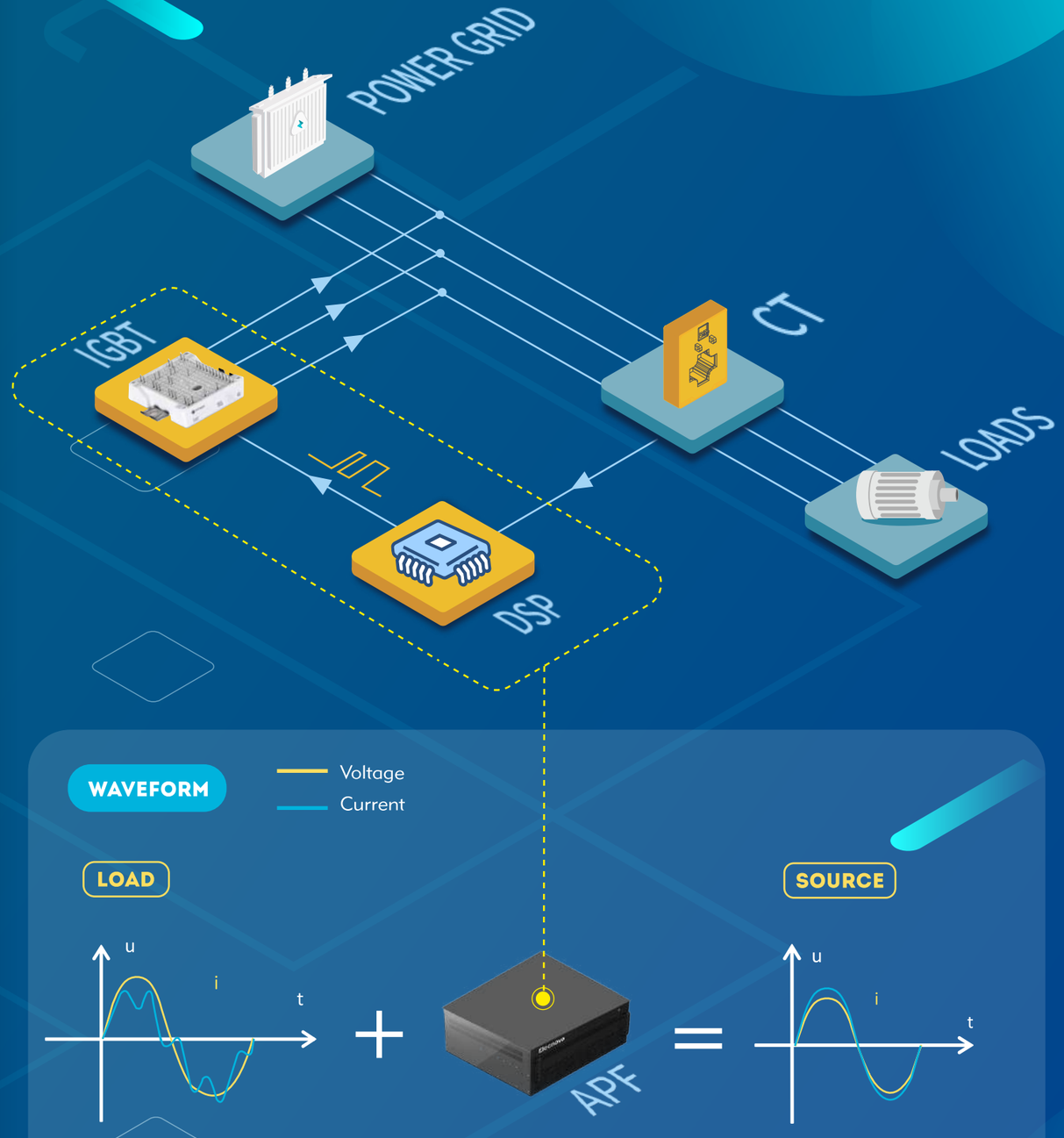
Reduce energy consumption, pay contribute to the environment protection.

PURIFYING POWER GRID 04

Reduce the harmonic pollution of the public grid and get rewards from the power supply department.

APF

The APF acquires the current signal of the load by the CT, separating the harmonic by the intelligent FFT(Fast Fourier Transform) by the DSP than send to the internal IGBT by the PWM signal. The APF will generate the compensation current with the same value but opposite phase as the system harmonic in order to achieve the real-time dynamic filtering function.



MAIN FEATURES

SFR-APF is applied to realize dynamic tracking compensation and on-demand allocation of active filtering, reactive power compensation and unbalanced current compensation.

FLEXIBLE APPLICATION SCHEME

- Modular design, easy to expand, up to 8 modules can be connected in parallel.
- Plug-in frame or wall-mounted installation, adapt to various environments.
- The CT installation position is flexible, which can be connected close to the power supply side or the load side.

EXCELLENT FILTERING PERFORMANCE

- The highest harmonic filtering is up to 51st, and the harmonic filtering rate ＞ 97%.
- Optional multiple compensation modes.
- Three-level main circuit, lower power consumption and higher efficiency.
- Total response time ＜ 5ms and faster control.

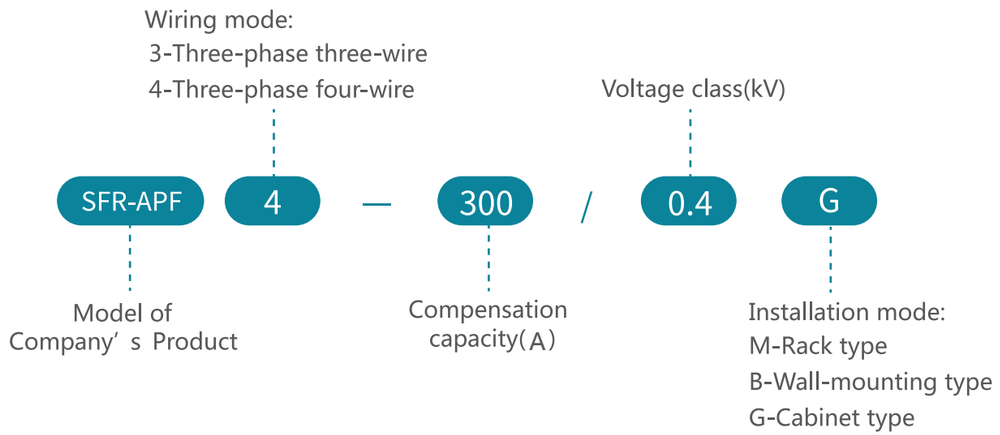
EXCELLENT PROTECTION FOR EQUIPMENT AND SYSTEM

- Device internal fault protection
- Device external electrical fault protection
- Automatic derating if the working environment exceeds the limits
- Support current limiting through software and hardware
- Resonance avoidance

FRIENDLY HUMAN-MACHINE INTERACTION

- 4.3 inch (module) and 7 inch/10 inch (full cabinet) LCD touch screen.
- Users can clearly view the power quality improvement of the system before and after compensation through the graphical display interfaces.

MODEL DESCRIPTION



SFR-APF							
Grid	400V					690V	
Mounting type	Rack-mounted		Wall-mounted		Cabinet	Floor model	Cabinet
Rated capacity(A)	30 50 75	100 150	30 50 75	100 150	up to 600	100 125 150	Up to 600
Dimensions (W×H×D)mm³	509×189×588	570×240×719	529×613×189	590×744×240	800×2200×800	300×1410×600	Up to 1500×2200×1000
Net weight	33kg	58kg	33kg	58kg	300kg-400kg	150kg	300kg-700kg

TABLE OF RAPID MODEL SELECTION

Transformer Capacity (kVA)	Capacity and Quantity of Active Power Filter (Three-phase Four-wire)	Capacity and Quantity of Active Power Filter (Three-phase Three-wire)
200	SFR-APF4 -50/0.4	SFR-APF3 -50/0.4
250/315	SFR-APF4 -50/0.4	SFR-APF3 -75/0.4
400	SFR-APF4 -75/0.4	SFR-APF3 -75/0.4
500/630	SFR-APF4 -75/0.4	SFR-APF3 -100/0.4
800	SFR-APF4-100/0.4	SFR-APF3 -150/0.4
1000	SFR-APF4-100/0.4	SFR-APF3 -200/0.4
1250	SFR-APF4-150/0.4	SFR-APF3 -250/0.4
1600	SFR-APF4-200/0.4	SFR-APF3 -300/0.4
2000	SFR-APF4-200/0.4	SFR-APF3 -400/0.4
2500	SFR-APF4-300/0.4	SFR-APF3-250/0.4×2
Scope of Application	Business center, office building, hotel, hospital, data center, theater and other occasions with relatively much single-phase load	Chemical, metallurgy, communication, textile, papermaking, printing, tobacco, automobile, port and other occasions with relatively much three-phase load

Note: Types M, B and G can be selected according to field situation.

TECHNICAL PARAMETER

SFR-APF				
Grid	400V		690V	
Mounting Type	Wall-mounted Rack-mounted	Cabinet	Floor model	Cabinet
System				
Rated Input	400V LL ±15%		690V LL ±15%	
Power Grid Frequency	50/60Hz ±5%			
Parallel Operation	8 modules, customizable			
Overall Efficiency	≥97%(laboratory data)			
Power Grid Structure	3P3W,3P4W		3P3W	
Circuit Topology	3-level			
Performance Indicators				
Rated Capacity	30A/ 50A/ 75A/ 100A/ 150A	Up to 600A	100A/125A/150A	Up to 600A
Compensation Mode	Harmonic, reactive power, unbalance			
Filtering Range	2 to 51 orders			
Filtering Order	Selectable from 2 to 51			
Filtering Degree	Adjustable from 2 to 51			
Reaction Time	<100μs			
Response Time	<5ms			
Target Power Factor	Adjustable from -1 to +1			
Control Algorithm	FFT, Intelligent FFT and instantaneous reactive power			
Switching Frequency	20kHz			
Cooling Mode	Forced air cooling			
Noise Level	≤65dB			
Communications and Monitoring Capabilities				
Communications Port	RS485			
Communications Protocol	Modbus-RTU			
Module Display Interface	4.3in LCD/ LED indicator	7in/10in LCD touch screen(optional)	LED indicator	7in/10in LCD touch screen(optional)
Protection Function	Automatic current limit protection for power grid over-voltage and under-voltage，power gridover-frequency and under-frequency，inverted sequence of input voltage，over-current,over-heating and over-load, and busbar short-circuit.			
Monitoring Alarm	Available			
Monitoring	Independent monitoring and centralized monitoring			
Environment Requirements				
Altitude	1,000m, for every increased 100m, the power is reduced by 1%.			
Operating Temperature	-20℃～45℃			
Relative Humidity	5% to 95%,non-condensing			
Protection Class	IP20			
Related Standards				
Directive	2014/30/EU 2014/35/EU			
Standards Compliance	EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011 EN 50178:1997			

APF

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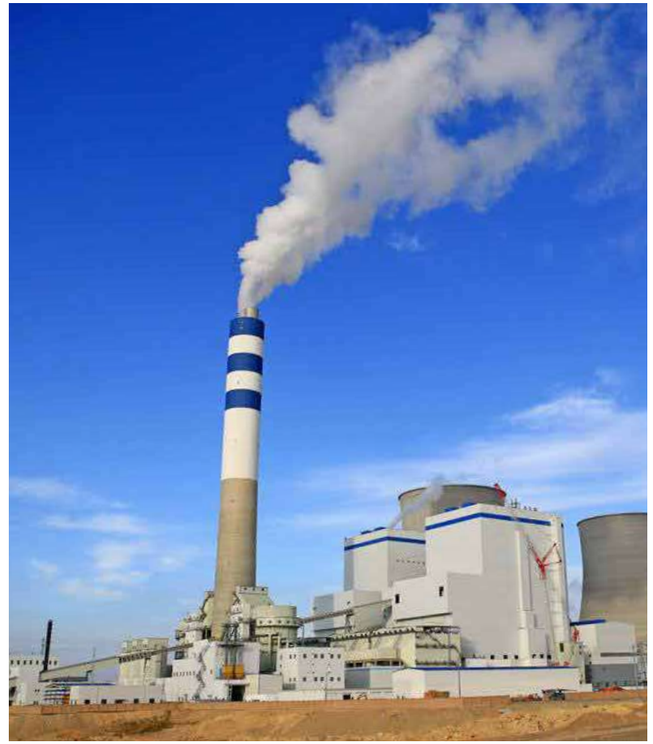
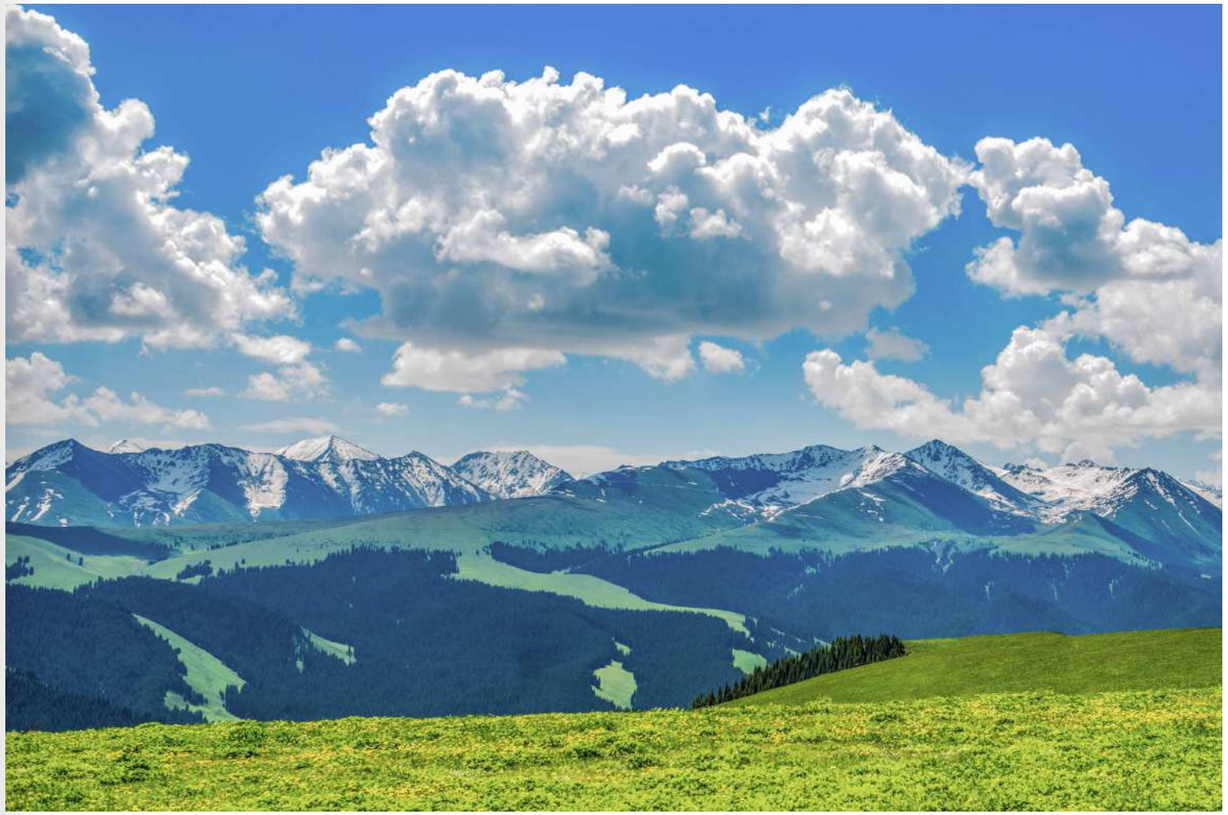
ACTIVE POWER FILTER

WORLDWIDE PROJECTS



Xinjiang, Hami Hydropower Station



Zhuhai，Yanheng Land Commercial Complex

JCET, jiangsu, china

Beijing Kehua Zhongsheng Network Cloud Computing Engineering Company Project