ReDeal

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ReDeal

Company Overview

ReDeal focus on the application of advanced power transformation technology in the field of power quality solutions, and provides users with Energy efficient power supply with power electronics technology as the carrier. The company with industry leading independent R & D team and quality supervision system, and with University and a number of well-known research institutes to maintain a long term cooperative relationship, always committed to provide customers with continuous optimization of power quality control program.

The company focus on customer demands, science and technology innovation, through many years of technology accumulation, has included APF active power filter, SVG static var generator, Hybrid power quality controller and a series of products power quality solutions. Through the refined research close to the needs of users, the related products already have the industry leading level, and are widely used in many industries, such as State Grid, hospital, sewage plant, electrified railway, urban rail transit, airport, port, petroleum, petrochemical, metallurgy, coal mine, automobile, shipbuilding, chemical industry, textile, communication, commercial building, etc. Based on technological innovation as the core competitiveness and multi-dimensional improvement of its own service level, we ReDeal is the drafter of the group standard of "low voltage active voltage deviation compensation device" and "low voltage hybrid dynamic reactive power compensation device" of power supply society

In order to realize the close combination of scientific and technological research ,industry and development of the university , the company and the graduate student from University the Electrical Engineering Academy ,have set up a cooperative training and education base for graduate students with professional degrees, and introduced the advanced technical experience of the team of experts in this field of University continuously to support the improvement of the company's product development

The company takes the future green energy efficient utilization as the idea, adhering to the higher quality technology service customer, keeps updating science and technology innovation and the expansion, is willing to build a better clean energy world together with you.

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ReDeal

ReDeal APF Functions

Meeting users' requirements:

PF=0.99 and THDi < 5%
Compensation for 2- to 50-order harmonics
Capacitive and inductive reactive power compensation
Three-phase unbalance compensation

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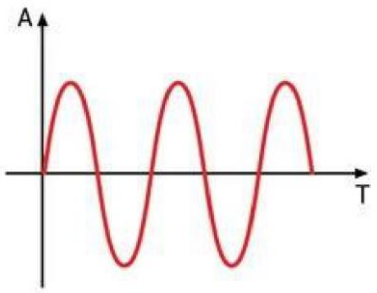
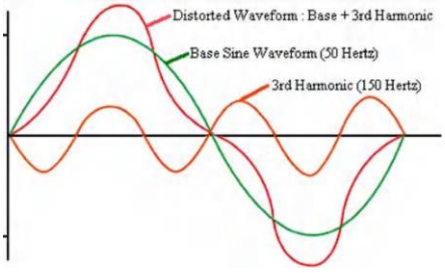
What's harmonic pollution?

In an electric power system, a harmonic of a voltage or current waveform is a sinusoidal wave whose frequency is an integer multiple of the fundamental frequency. Harmonic frequencies are produced by the action of non-linear loads such as rectifiers, discharge lighting, or saturated electric machines. They are a frequent cause of power quality problems and can result in increased equipment and conductor heating, misfiring in variable speed drives, and torque pulsations in motors and generators.

The impact of harmonic pollution is an increasing problem given the growth of sophisticated power electronics and the proliferation of non-linear loads in power systems. Such loads are increasingly used in all industrial, commercial and residential installations.



Sinusoidal AC Waveform



Waveform influenced by harmonics

Typical non-linear loads

Common examples of non-linear loads include rectifiers, variable-speed drives and electronic devices such as computers, printers, TVs, servers and telecoms systems that use switched-mode power supply (SMPS) power conversion technologies. They are also typically found with blade servers.

Typical non-linear loads include:

- Variable speed drives for asynchronous and DC motors
- Industrial equipment (induction furnaces, static converters, welding machines)
- Uninterruptible power supplies (UPS) and saturated magnetic devices
- Office equipment (computers, servers, printers, photocopy machines)
- Switch-mode power supplies, fluorescent lighting, TV, light dimmers, microwave ovens, etc.

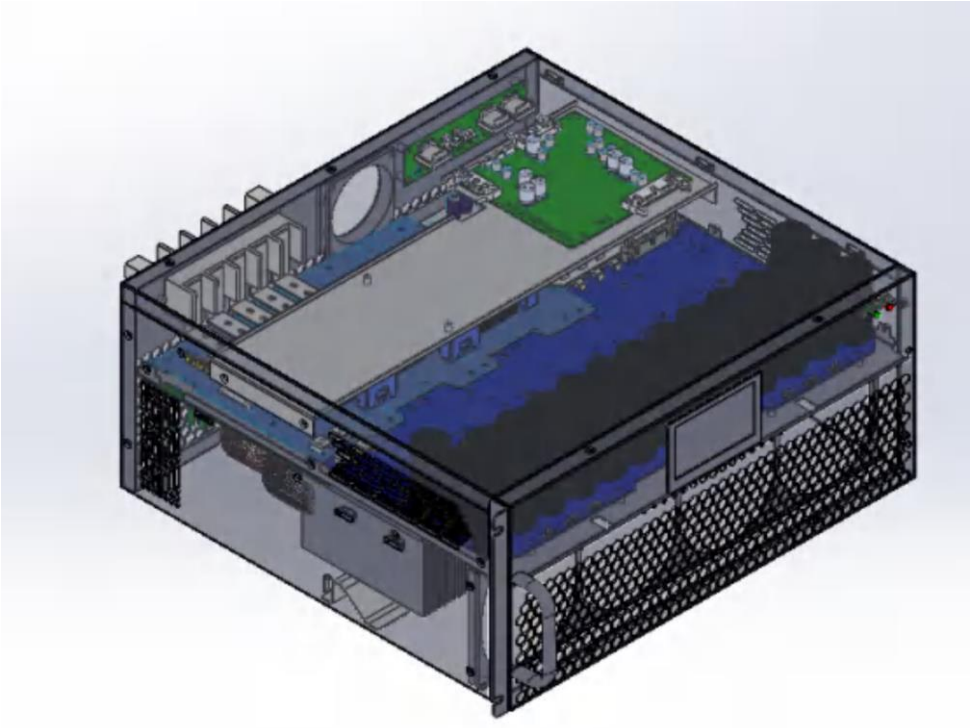
What problems can harmonics cause?

Harmonics causes malfunctioning of electrical/electronic parts, overheating of neutral wires, transformer heating, and malfunctioning of power factor correction capacitors, power generation and transmission losses, disruption of protection, control and communication networks as well as customer loads

- Overheating (thermal losses) of cables, transformers, motors & distribution panels resulting in greater electrical & mechanical stress on the electrical system
- Costly downtime leading to higher operation and replacement costs
- Reduction in the lifespan of equipment, including motors and drives
- Premature degradation of a motor's bearings & insulation
- Overloading of neutral conductors
- Load imbalance
- Unstable network conditions
- Malfunction or premature failure of equipment
- Reduced safety levels of installations
- Logic faults or component failures in PLC's/SCADA/BAS systems or other sensitive loads
- Nuisance tripping of protective devices
- Poor power factor

How do filters reduce harmonics?

Active filter cancels the harmonics current on the ac system by injecting current of same amplitude and reverse phase as the harmonic currents of the load to offset the harmonic current.



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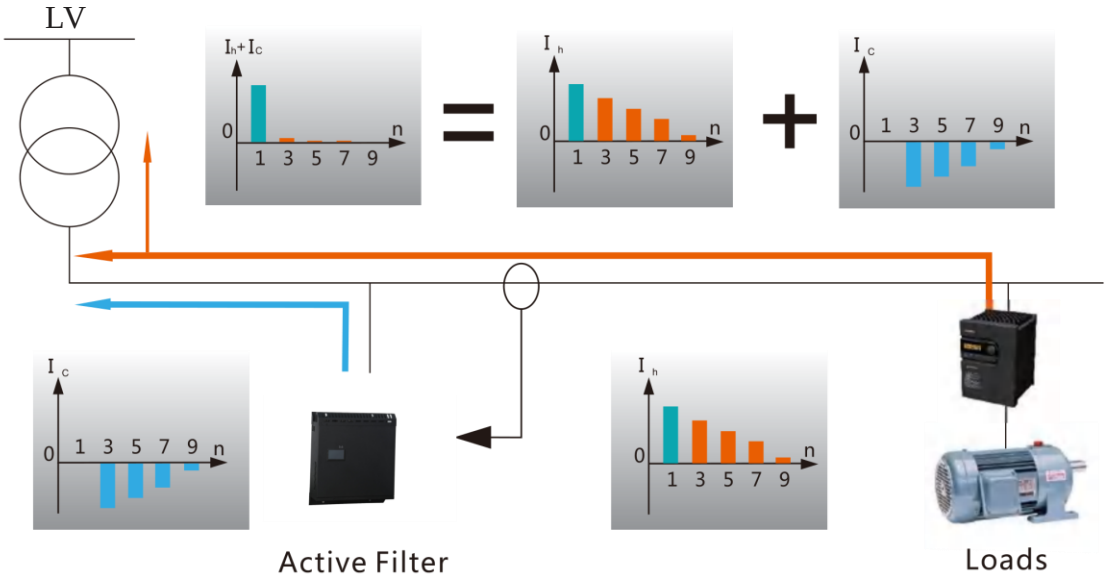
Advanced Performance

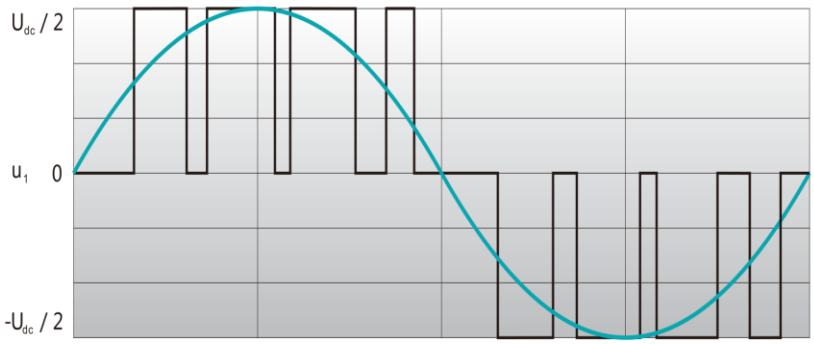
The 3-Level Topology Design Approach

ReDeal have introduced their latest generation 3-level NPC topology Active Power Filters that incorporate many unique and innovative design features. Active Power Filters are designed for mitigating harmonics that are injected into power networks by non-linear loads.
Generally installed in floor stand cabinet or wall mounted hanging modules, the 3 level active filters has the following main features
Fast response time,20KHz high IGBT switching frequency
Improve system voltage resistance
Dynamic real time compensation,not affected by system imbalance



When harmonic mitigation is required, the operating circuit measures the load current and calculates the harmonic current spectrum via the advanced control algorithm programmed in the DSP. ReDeal APF series employs a Fast Fourier Transform (FFT) logic calculation method for the harmonic current spectrum from the 2nd to the 50th order. The logic then determines the amplitude of the compensated current control signal, to be injected at the opposite phase angle for each harmonic order selected for mitigation.

The compensated current generating circuit will then provide a control signal to the IGBT (semiconductor switch) via Pulse Width Modulation (PWM) and consequently a compensation current with perfect opposite phase for each harmonic is injected into the system. As a result, the harmonic currents at the supply side are signifci antly reduced.



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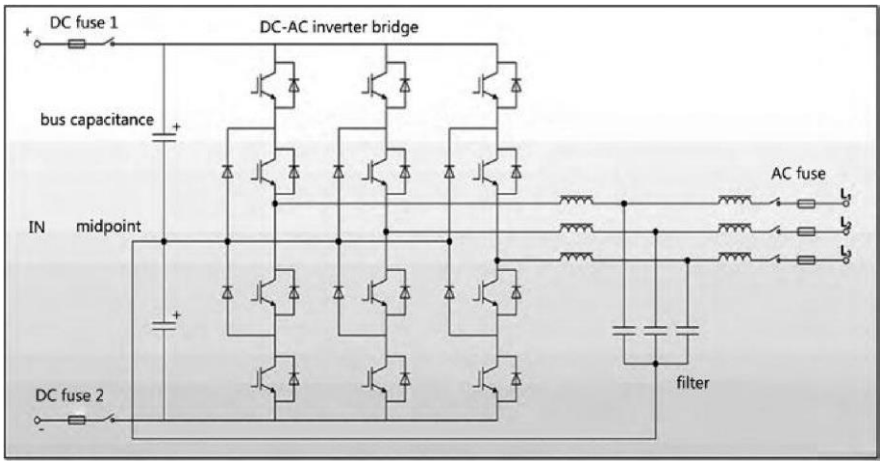


3-level Topology Circuit Diagram

Owing to its 3-level topology design based on a zero level voltage transformation (comprising of IGBT's of lower voltage corresponding higher switching frequency). ReDeal Active Power Filters are capable of suppressing the undesirably generated ripple currents effectively and promote a high compensation precision for the output waveform with respect to the sinusoidal waveform.

Harmonics Compensation Capability

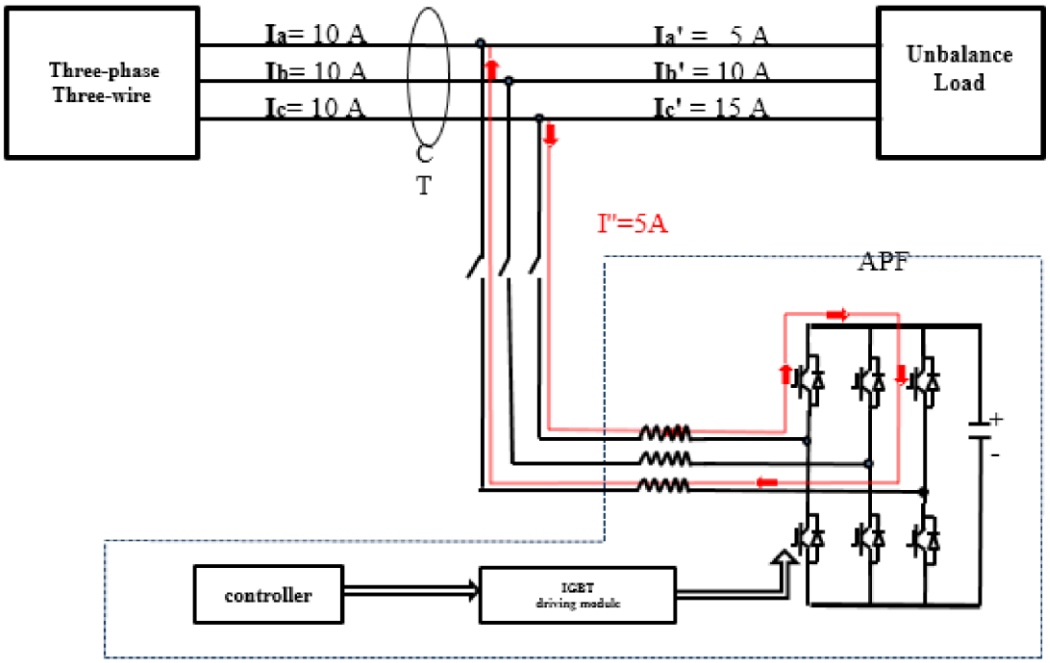
Compensates 2nd to 50th harmonic order or simultaneous compensation or all 50 harmonic orders.

Algorithm Intelligence

Intelligent technology that integrates both FFT and Dynamic Compensation Modes, customised to the client's requirements

Load Balancing and Reactive Power

During operation, ReDeal Active Power Filters are capable of measuring each phase and then redirecting the existing load current to balance the phases. They are also capable of using their remaining capacity to dynamically inject reactive power to correct the power factor. It is possible for the user to program the unit to prioritise load balancing or reactive power, depending on the application.



ReDeal

Modular, Compact Size and Light Weight

Traditional Active Power Filters are large and heavy, often taking up valuable floor space in switch rooms. ReDeal have applied new generation thinking and innovative design principles to create a range of Active Power Filters that feature a modular design and are available in wall-mount, rack-mount and rack/cabinet configurations. This flexibility gives engineers multiple options to cater for all situations and ultimately save valuable space and 'floor real-estate'

- ✔ Up to 150A capability from a wall-mount solution
- ✔ Up to 150A capability from a single rack-mount module
- ✔ Up to 750A capability from a single cabinet solution

30A Solutions

30A Wall-Mounted APF – 15kg
423W x 88D x 550H (mm)

30A Rack-Mounted APF – 14kg
452.5W x 450D x 86H (mm)

50A Solutions

50A
Wall-Mounted APF – 15kg
423W x 88D x 550H (mm)

50A Rack-Mounted APF – 14kg
452.5W x 450D x 86H (mm)

75A Solutions

75A Wall-Mounted APF – 36kg
503W x 190D x 597H (mm)

75A Rack-Mounted APF – 35kg
550.6W x 540D x 190H (mm)

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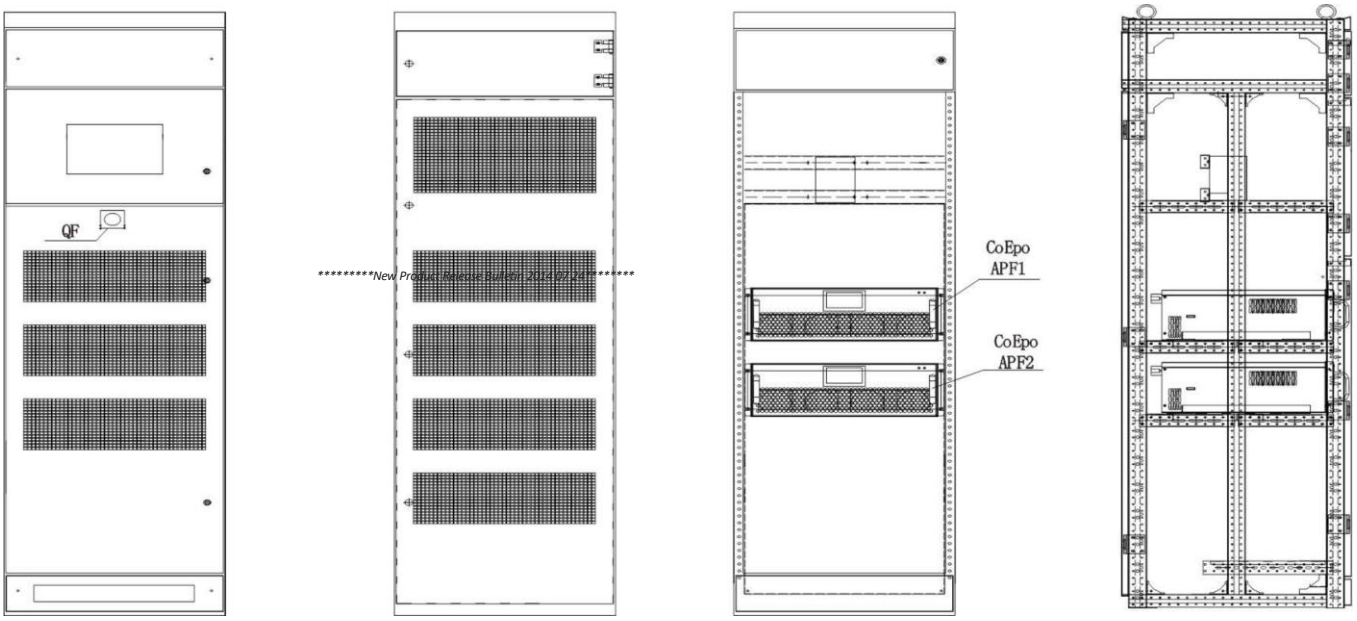
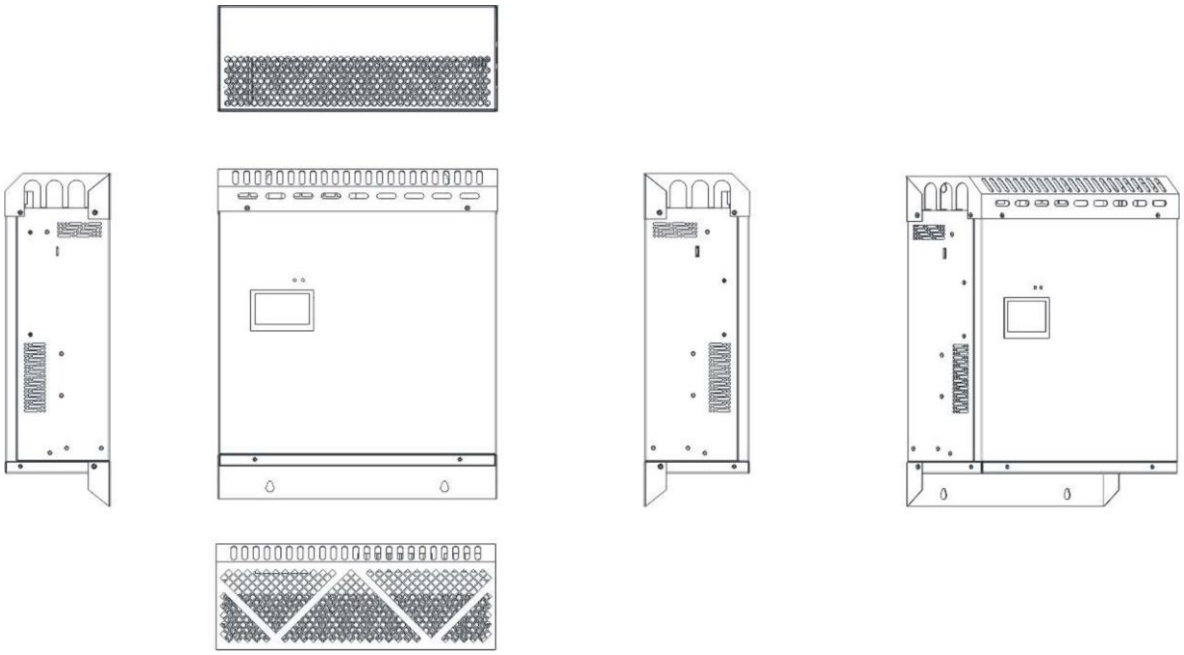
Installation mode

Support rack mount and wall mount two mstallation methods



Rack Mount Cabinet

Rack mounted, suitable for centralized treatment and local treatment.The maximum capacity of parallel cabinet is 750A. 7/10 inch optional LCD touch screen. It can be parallel with various types of distribution cabinets, which is convenient for installation



Wall Mount Module

Wall mounted installation is suitable for local treatment and other situations where the installation space is relatively tight. Single APF module wall mounted installation is flexible and convenient

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Key Features

Easy to Use Graphical User Interface

The ReDeal series integrates a HMI including a graphical user interface. It offers direct control, configuration, monitoring and harmonics analysis of the APF without the need of a PC. Communication options, detailed alarm events and fault reporting with real time stamp are also included.

Backlit Display

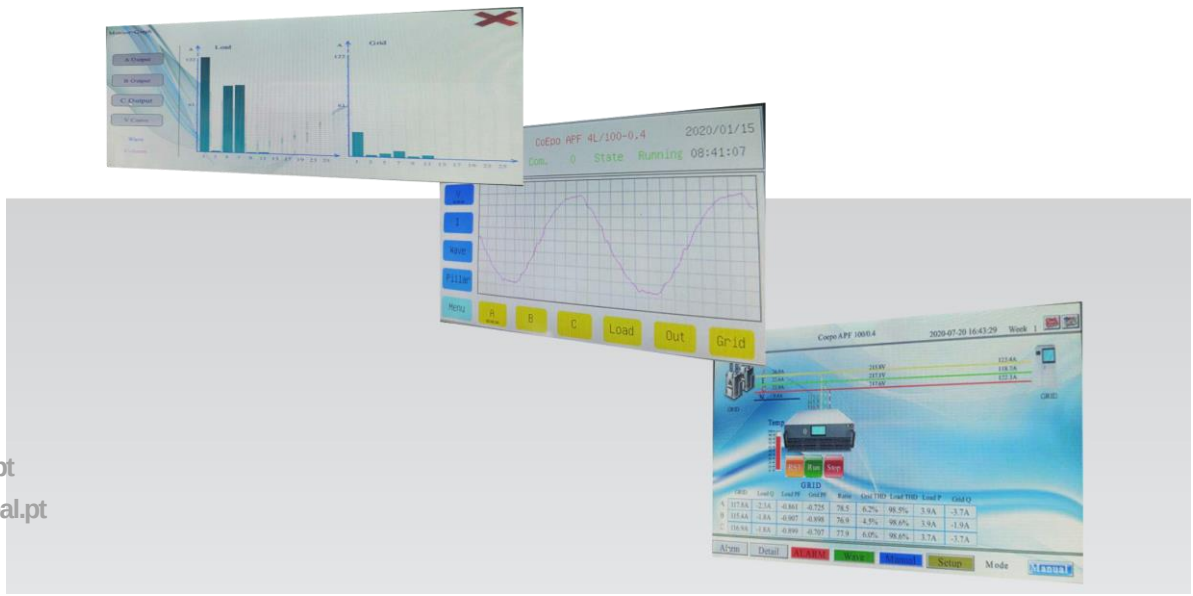
Incorporating a high level of readability and ease of menu navigation, the backlit LCD display offers:

- Access and configuration of operating parameters
- Measurement data in numerical, graphical and spectrum
- Operation status inclusive of detailed alarms and fault messages
- Password protected for critical settings

Measurements

Provides a comprehensive set of measurement data for analysis, such as:

- Network RMS voltages and currents
- Network Voltage and current distortions (THDu and THDi)
- Total RMS load currents and THDi
- System frequency
- Load factor
- Compensated RMS currents
- Comparison of PF (before and after)
- Graphical waveform of network voltages and currents, load and compensated currents
- Harmonic spectrum for network and load currents, from 2nd to 50th harmonic order



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ReDeal APF Technical Sheet

Item	
Ratedinput	380V*（1±20%）
Powergridfrequency	50Hz/60Hz
Paralleloperation	Unlimited
Overallefficiency	≥ 97%
Power grid structure	3P3W,3P4W
CT	50/5 ~ 5000/5
Performanceindicators	
Ratedcapacity	30A/50A/75A/100A/150A
Harmonic compensation	Available
Reactivepower compensation	Available
Unbalance compensation	Available
Filteringrange	2to50orders
Filteringdegree	Adjustablefrom2to50
Filterperformance	THDi<5%
Overallresponse time	<10ms
Targetpowerfactor	Adjustablefrom-1to+1
Controlalgorithms	FFT, Intelligemt and instantaneous reactive power
Switchingfrequency	20kHz
Noiselevel	<60dB
Communicationsandmonitoringcapabilities	
Communications ports	RS485 Communication And MODBUS -RTU Protocol/Optional Ethernet
Communications protocols	Modbus Protocol
Module display interface	4.3inch Touchscreen
PC software	Optional
Protectionfunctions	over-valtage protection, under-voltage protection,short-circuit protection,inverter bridge inverse protection, over-compensation protection and so on
Faultalarm	Available at most 500 alarm records
Monitoring	Independentmonitoringandcentralizedmonitoring
Mechanicalproperties	
Altitude	1% up 2000 m. Between 2000 m to 4000 m, according to GB/T3859.2, the power decreases by 1% for every additional 100 m.
Operating temperature	-10℃ ~ +45℃
Relativehumidity	5% to95% non-condensing
Protectionclass	IP20 (other IP classes are customizable.)

Note：1.Customize service optional.
2.Product update without further notice.

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SVG Functions

ReDeal SVG main function

PF=0.99
(-1,1) Capacitive and inductive reactive power compensation
3 phase imbalance correction
2-12th harmonic filtering

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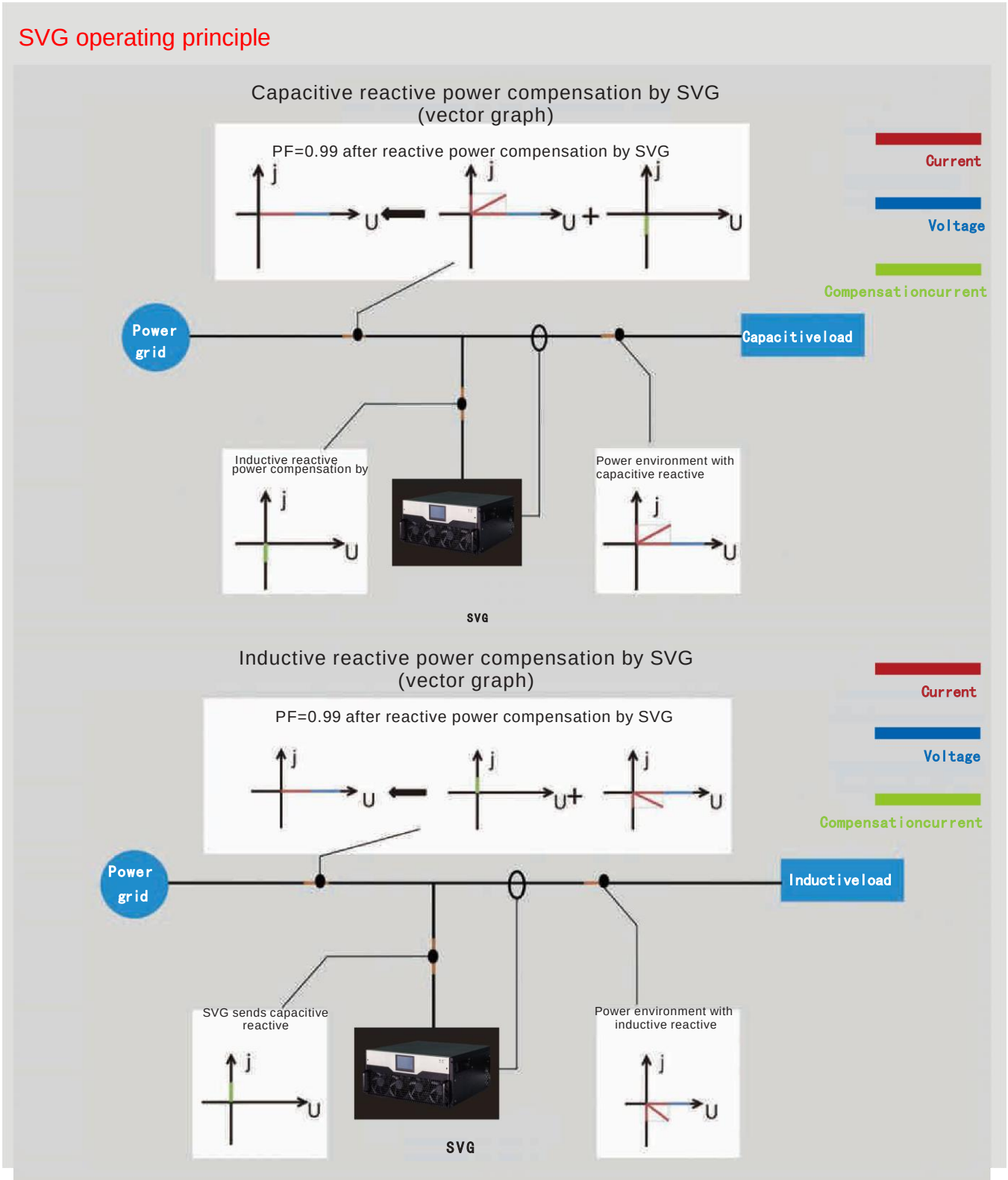
ReDeal SVG

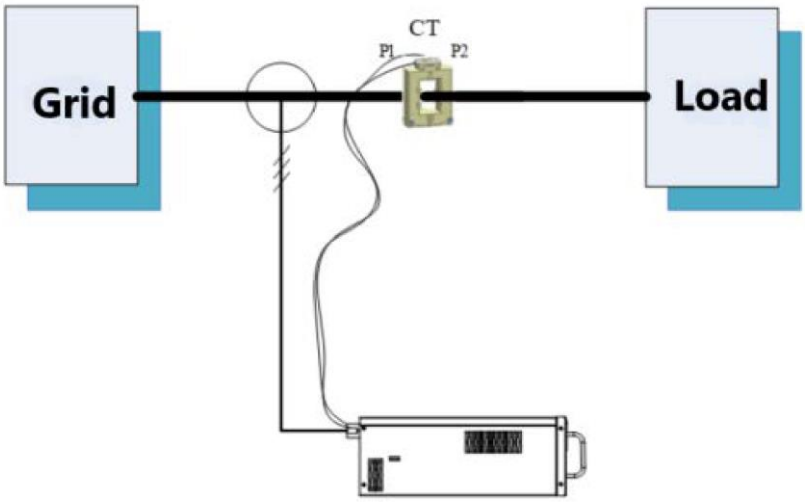
ReDeal SVG Static Var Generator work through the external CT current transformer, real-time monitoring the load current, and through the internal DSP calculation to analyze the reactive current, and then set this value to control the PWW signal to send control signals to the internal IGBT inverter Device to meet the requirements of the reactive power compensation current, and ultimately achieve the purpose of dynamic reactive power compensation.

SVG operating principle



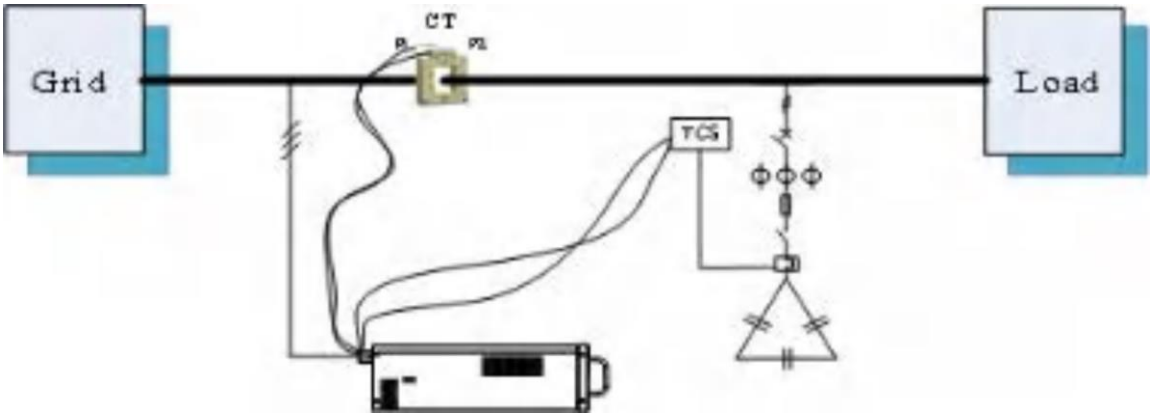
How SVG wiring?

1.Pure SVG compensation system



CoEpo SVG

2.Independent control in hybrid compensation system with APFC



CoEpo SVG

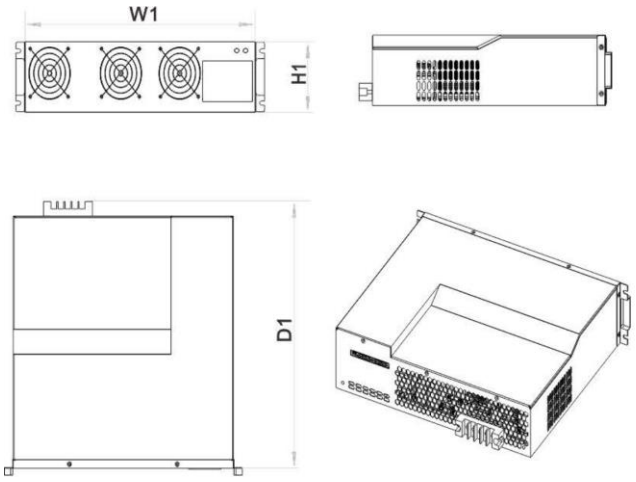
RSVG (ReDeal Static var generator)

Mode description

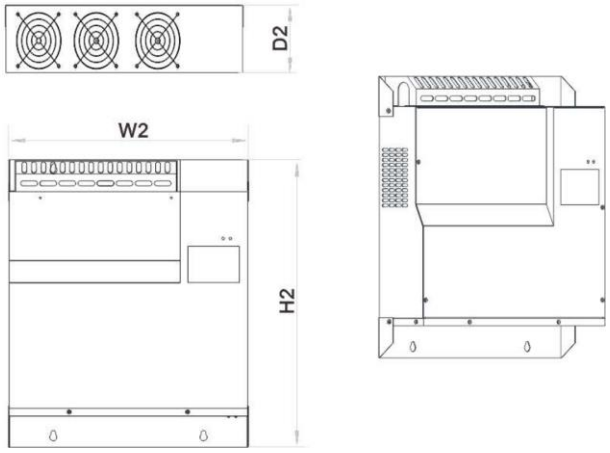
R	SVG	XXX	0.4	W
A	B	C	D	E

Serial number	
A	Company code：ReDeal
B	SVG (Static Var Generator)
C	Compensation current：30kvar/50kvar/75kvar/100kvar
D	Voltage degree：0.4KV (400V)
E	D:Rack mounted W:Wall mounted

Product structure



Rack Mounted



Wall Mounted

Installation	Rack Mounted			Wall Mounted		
Dimension(mm)	30kvar/50kvar	75kvar	100kvar	30kvar/50kvar	75kvar	100kvar
W	452.5 472	550.6	558	423 503	503	503
D	450 540	540	540	88 122	190	220
H	86 122	190	220	550 558	597	608

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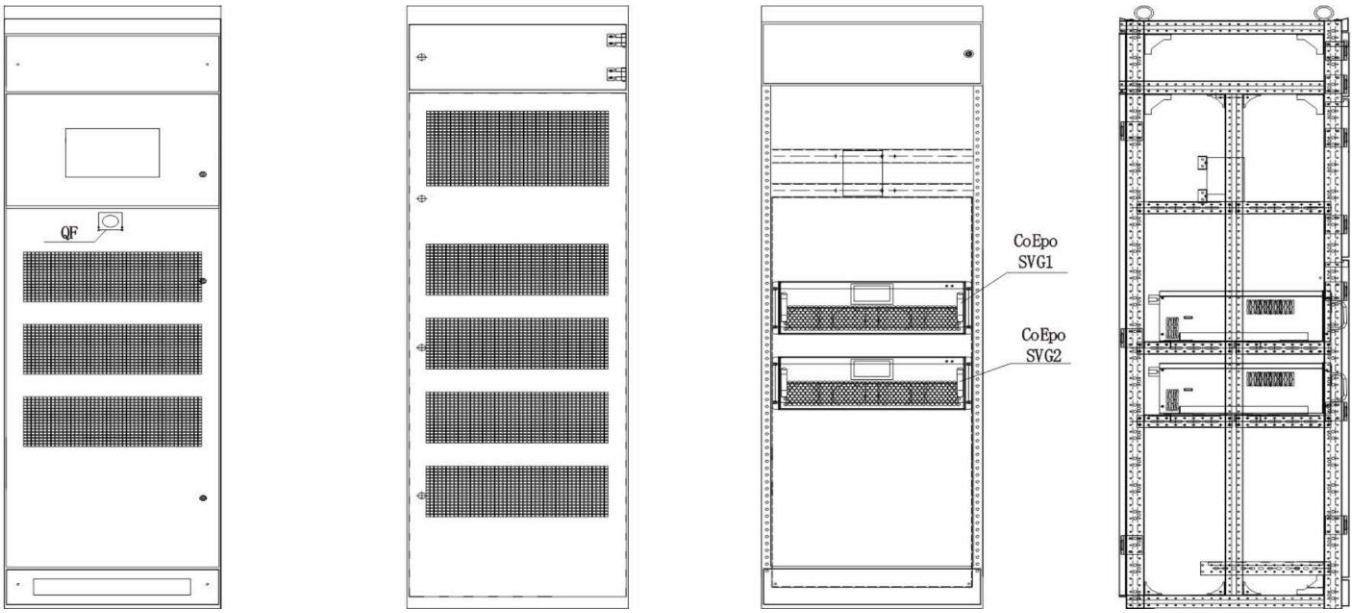
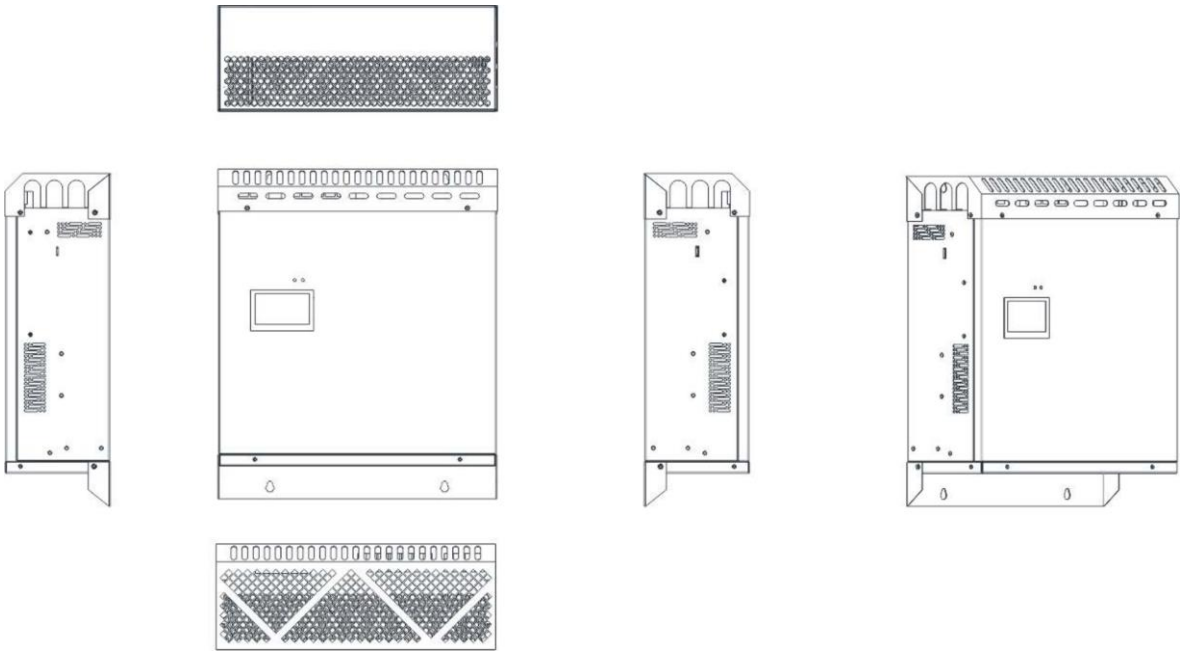
Installation mode

Support rack mount and wall mount two mstallation methods



Rack Mount Cabinet

Rack mounted, suitable for centralized treatment and local treatment.The maximum capacity of parallel cabrnet is 500kvar. 7inch LCD touch screen is selected. It can be parallel with various types of distribution cabinets, which is convenient for installation



Wall Mount

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ReDeal SVG Technical Sheet

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Powergridfrequency	50Hz/60Hz
Paralleloperation	Unlimited
Overallefficiency	≥ 97%
Power grid structure	3P3W，3P4W
CT	50/5 ~ 5000/5
Performanceindicators	
Ratedcapacity	30kvar/50kvar/75kvar/100kvar
Harmonic compensation	Available
Reactivepower compensation	Available
Unbalance compensation	Available
Filteringrange	2to12orders
Filteringdegree	Adjustablefrom2to50
Filterperformance	THDi<5%
Overallresponse time	<10ms
Targetpowerfactor	Adjustablefrom-1to+1
Controlalgorithms	FFT, Intelligemt and instantaneous reactive power
Switchingfrequency	20kHz
Noiselevel	<60dB
Communicationsandmonitoringcapabilities	
Communications ports	RS485 Communication And MODBUS -RTU Protocol/Optional
Communications protocols	Modbus Protocol /optional Ethernet
Module display interface	4.3inch Touchscreen
PC software	Optional
Protectionfunctions	over-valtage protection, under-voltage protection,short-circuit protection,inverter bridge inverse protection, over-compensation protection and so on
Faultalarm	Available at most 500 alarm records
Monitoring	Independentmonitoringandcentralizedmonitoring
Mechanicalproperties	
Altitude	1% up 2000 m. Between 2000 m to 4000 m, according to GB/T3859.2, the power decreases by 1% for every additional 100 m.
Operating temperature	-10℃ ~ +45℃
Relativehumidity	5% to95% non-condensing
Protectionclass	IP20 (other IP classes are customizable.)

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