Reactive Compensation / Filter Capacitors

1. Model Illustration

TM P O SY □ 525 □ – 50 – 3

3	1-Single phase 3-Three phases
50	Rated capacity(kvar)
–	√ 3-Phase splitting compensation Blank-Total compensation
525	Rated voltage
SY	Identification code
O	Enterprise code
P	Filling material D | Dry type O | Oil type
O	Dielectric PP
TM	Specialized metalized structure

2. Product Introduction

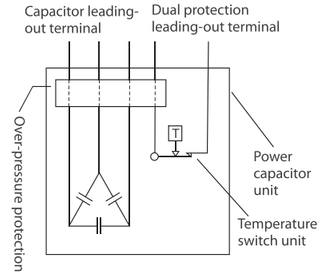
Low voltage power capacitor is also called as"Self-healing Low Voltage Power Shunting Capacitor", which can be comprehended as "a container for storing electricity", the film capacitor is available to repair by itself, that means it can self-healing quickly and renew to work when over pressure destroys the part of medium. Low voltage power capacitor, as one of the core components to improve power quality, is mainly used for reactive power compensation, power factor improvement, inhibiting harmonics when matched with series reactor, decreasing power line loss and improving the ration of devices utilization.

3. Product Features

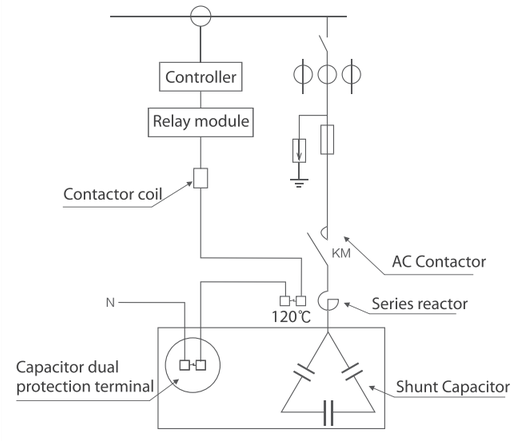
- Cylindrical aluminum housing, with the characteristics of good heat dissipation, light weight, small volume and rust-proofing etc.
- According to different occasions, provides a variety of wiring terminals for customers to choose.
- SY patent--dual protection internal install secondary protective device and over-pressure dis-connector.
- Adopt the most advanced winding machine to make sure the stability and consistency of every product.
- Obtain UL safety certification and TUV product certification.

4. Dual Protection Capacitor

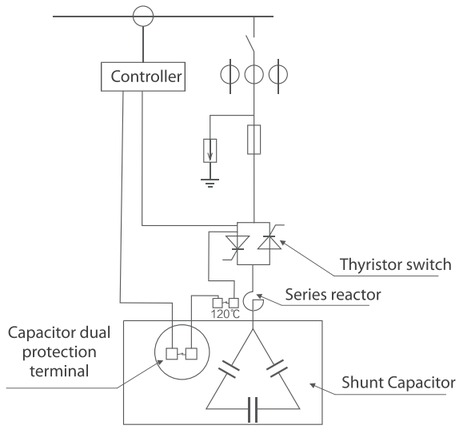
The H terminal capacitor is a new generation product in the world which is produced by Sheng Ye Electric and has a number of patents with the dual protection structure (Patent number: ZL200920052757X, ZL200920052756.5, ZL200930070501.7). The H type capacitor is used for large current and large capacity occasions, maximum to 35mm conductors. By adopting the new type safe explosion protection structure, building block structure and filling with gas internal, the terminal possesses a more beautiful and delicate appearance. It is stable and reliable, with high anti-inrush current capability so as to meet the highest environmental grade requirement. When the capacitor running under over-temperature caused by power grid harmonic and over-voltage in the system, this kind of capacitor will output the control signal, cut off the switch and step into the exceeded temperature protection condition for preventing the capacitor from putting into power grid until the temperature decreased to an acceptable range, then it can switch into the working condition. In order to extend the capacitor and series reactor lifespan in the detuning compensation and tuning filter system, these several capacitors with dual protection can be installed in series to avoid the deviation of tuning causing by the failure of one or more capacitors, which will cause a certain number of harmonic current amplification and result in system breakdown. With the help of dual protection of capacitor it will force the random failure system out of working condition, until the maintenance is finished to prevent the spread of the accident.



5. Dual Protection Capacitor Wiring Diagram

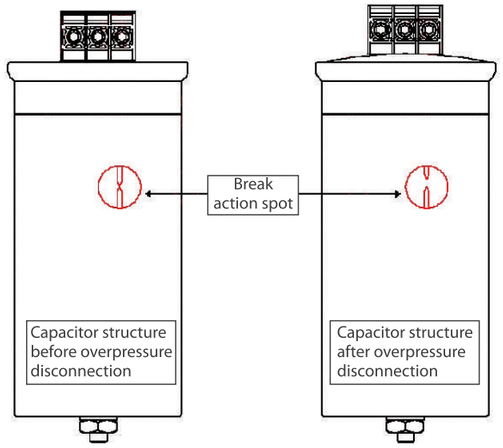


■ AC Contactor Switching Diagram



■ Combination Switching/Thyristor Switching Diagram

6. Overpressure Cut-off And Anti-explosion Structure



7. Technical Parameters

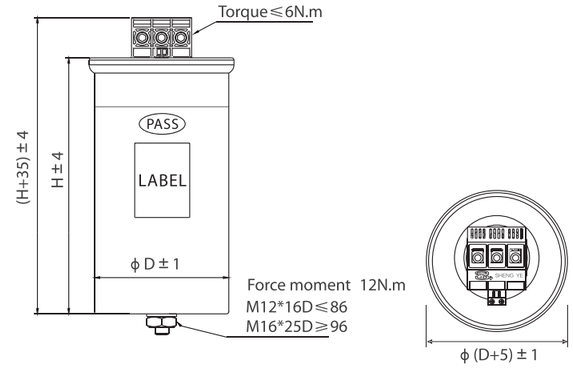
7.1 Environment Conditions	
Ambient temperature	-40/D
Relative humidity	⩽90%
Altitude	⩽2000m
7.2 General parameters	
Loss	DF⩽0.001
Capacity tolerance	-5%~+10%
Withstand voltage between terminal and terminal	2.15Un VAC, 5 Seconds
Withstand voltage between terminal and housing	3600VAC, 2 Seconds
Discharge	Below 75V after power off within 3mins
Sealing performance	90 ± 2℃ ,no leakage(Oil filled) within 3h ,Leakage ratio <0.5SCCM(Gas filled)
Safety performance	Has reliable over-pressure and disconnection protection; meets the requirement of destructive test of IEC60831-2 standard and meet the requirement of UL810 standards 10000AFC
7.3 Operation parameters	
Maximum overvoltage	1.1Un
Maximum over current	1.3In
Reliability	The failure rate is <6%/0.5% (1PPM component /hour) when products run 60000/5000 hours under rated voltage and nominal temperature. Meet the requirement of the American Electrical Industry Association standard EIA-456-A
7.4 Standard	
GBT/12747.1-2017 GB/T12747.2-2017	EC60831-1-2017 IEC60831-2-2014
EN60831-1-1998+A1-2003 EN60831-2-1996	EIA-456-A-1989 UL810-2008

8. Special Tips

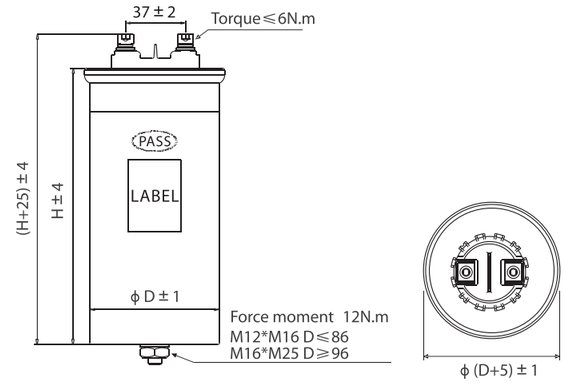
1. Capacitors should be installed under the standard of IEC61921 and EN60831, the distance among units should not be less than 30mm.
2. Capacitors are non heat-resisting products. In order to increase capacitors lifespan, please keep them away from the heat sources, such as detuned reactors, dynamic switches and another large heat release products.
3. The panel should be designed and installed proper cooling fan according to the ambient temperature, so as to meet the temperature inside the cabinet.
4. Capacitors should be put on the bottom layer of the panel when installing. It is unsuitable to install with other products. Don't put capacitors upper the detuned reactor, thyristor switch or other heating products.
5. Before installing the capacitor, please read carefully the operating manual of TMPDSY, TMPOSY series of metalizing self-healing type low voltage shunt capacitor.

9. Product Structure Diagram

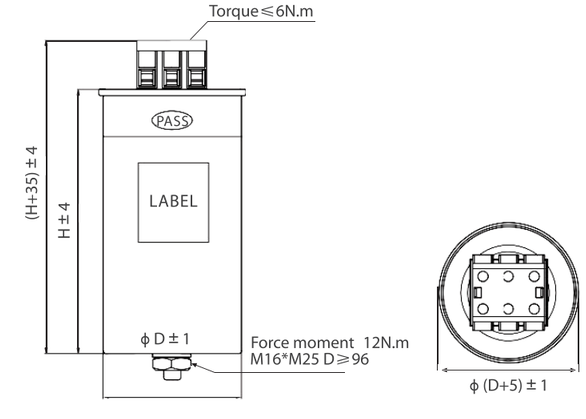
H terminal



L terminal



A terminal



10. Model List

Model	Voltage (v)	Rated capacity (kvar)	Rated capacitance (uF)	Rated current (A)	Dimension (mm)	Application
415V Power Capacitor						
TMPOSY 415-2.5-3	415	2.5	46.2	3.48	Φ76*175-M12*16	Three-Phase Adopted 400V system voltage for pure compenstion or matched with 7% reactor
TMPOSY 415-5-3	415	5	92.5	7	Φ76*240-M12*16	
TMPOSY 415-10-3	415	10	184.9	13.9	Φ86*240-M12*16	
TMPOSY 415-12.5-3	415	12.5	231.1	17.4	Φ86*240-M12*16	
TMPOSY 415-15-3	415	15	277.4	20.9	Φ96*240-M16*25	
TMPOSY 415-20-3	415	20	369.8	27.8	Φ116*240-M16*25	
TMPOSY 415-25-3	415	25	462.3	34.8	Φ116*285-M16*25	
TMPOSY 415-30-3	415	30	554.7	41.7	Φ116*285-M16*25	
TMPOSY 415-40-3	415	40	739.7	55.6	Φ136*285-M16*25	
TMPOSY 415-50-3	415	50	924.6	69.6	Φ136*285-M16*25	
440V Power Capacitor						
TMPOSY 440-2.5-3	440	2.5	41.1	3.3	Φ76*175-M12*16	Three-Phase Adopted 400V system voltage for pure compenstion or matched with 7% reactor
TMPOSY 440-5-3	440	5	82.2	6.6	Φ76*175-M12*16	
TMPOSY 440-10-3	440	10	164.5	13.1	Φ76*240-M12*16	
TMPOSY 440-12.5-3	440	12.5	205.6	16.4	Φ86*240-M12*16	
TMPOSY 440-15-3	440	15	246.7	19.7	Φ96*240-M16*25	
TMPOSY 440-20-3	440	20	329	26.3	Φ106*240-M16*25	
TMPOSY 440-25-3	440	25	411.2	32.8	Φ116*240-M16*25	
TMPOSY 440-30-3	440	30	493.5	39.4	Φ116*285-M16*25	
TMPOSY 440-40-3	440	40	658	52.5	Φ136*285-M16*25	
TMPOSY 440-50-3	440	50	822.5	65.6	Φ136*285-M16*25	
525V Power Capacitor						
TMPOSY 525-5-3	525	5	57.8	5.5	Φ76*175-M12*16	Three-Phase Adopted 400V system voltage matched with 7% reactor or match with 14% reactor
TMPOSY 525-10-3	525	10	115.5	11	Φ76*240-M12*16	
TMPOSY 525-12.5-3	525	12.5	144.4	13.7	Φ86*240-M12*16	
TMPOSY 525-15-3	525	15	173.3	16.5	Φ96*240-M16*25	
TMPOSY 525-20-3	525	20	231.1	22	Φ106*240-M16*25	
TMPOSY 525-25-3	525	25	288.9	27.5	Φ116*240-M16*25	
TMPOSY 525-30-3	525	30	346.6	33	Φ116*285-M16*25	
TMPOSY 525-40-3	525	40	462.2	44	Φ136*285-M16*25	
TMPOSY 525-50-3	525	50	577.7	55	Φ136*285-M16*25	

■ Remarks: the above are the general specifications, please contact us when you have special requirements.

Series Filter Reactors

1. Model Illustration

LCSY – □ 480 – 30 / 7.0 – □

- Blank-Three phase N-Single phase
- Reactance ratio(%)
- Power capacitor capacitance (kvar)
- Capacitor rated voltage(VAC)
- Enterprise code
- Reactor Model

2.Application Range

Capacitor will be affected and easily damaged by harmonic current, inrush current and over voltage in the reactive power harmonic, it is necessary to install the detuned reactor so as to inhibit and absorb harmonics, prevent the current and voltage from affected as well as improve the reliability and stability of Power system.

3.Product Features

- Suppress harmonic amplification and filter a proportion of harmonic.
- After the precise matching, series reactor is matched with capacitor to be reactive filter, which can eliminate some certain kind of harmonic precisely.
- Suppress the inrush current when the capacitor switching into the system and protect capacitors other components.

4.Technical Parameters

Index	Parameters
Rated voltage of matching capacitors	277V/303V/480V/525V
Reactance ratio	6.0%,7.0%,12%~14%
Phase	Single phase, Three-phase
Inductance deviation	0≤Ln≤5%
Linearity	1.4In - 1.8In
Stable over current	≤1.35In Long-time running
Withstand voltage	3.0kV/50Hz/5mA/60s No arc breakdown
Temperature rise	Rated current, Coil temperature rise≤75K
Noise	≤48dB(1m horizontal distance from reactor)
Protection grade	IP00
Standard	GB19212-2016； GB1094.6-2011

Operating environment

Environment temperature: -25℃~+55℃

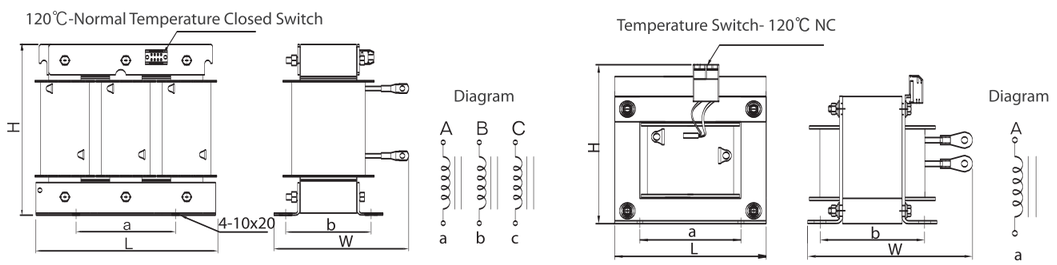
Humidity: ＜90%

Altitude above sea level: ＜1000m (When ＞1000m, automatic derating 1%/100m).

No toxic gas, no flammable and explosive materials around.

Good ventilation around, if installed in the cabinet, ventilation device should be added.

5. Diagram



6. Model List

No .	Wiring Method	Model	Reactance Ratio （%）	Current (A)	External Dimension (mm) ± 5.0mm			Installation dimension (mm) ± 2.0mm	
					(L)Length	(W)Width	(H)Height	(a) Front Side	(b) Lateral Side
1	Three Phase Total Compensation	LCSY 415-10/7.0	7	13.9	190	160	160	155	85
2		LCSY 415-15/7.0	7	20.9	190	160	160	155	85
3		LCSY 415-20/7.0	7	27.8	190	170	180	155	95
4		LCSY 415-25/7.0	7	34.8	190	170	180	155	95
5		LCSY 415-30/7.0	7	41.7	230	190	205	200	115
6		LCSY 415-40/7.0	7	55.6	230	190	205	200	115
7		LCSY 415-50/7.0	7	69.6	250	205	230	200	120
8		LCSY 440-10/7.0	7	13.1	190	160	160	155	85
9		LCSY 440-15/7.0	7	19.7	190	160	160	155	85
10		LCSY 440-20/7.0	7	26.2	190	170	180	155	95
11		LCSY 440-25/7.0	7	32.8	190	170	180	155	95
12		LCSY 440-30/7.0	7	39.4	230	190	205	200	115
13		LCSY 440-40/7.0	7	52.5	230	190	205	200	115
14		LCSY 440-50/7.0	7	65.6	250	205	230	200	120
15		LCSY 525-10/7.0	7	11	190	160	160	155	85
16		LCSY 525-15/7.0	7	16.5	190	160	160	155	85
17		LCSY 525-20/7.0	7	22	190	170	180	155	95
18		LCSY 525-25/7.0	7	27.5	190	170	180	155	95
19		LCSY 525-30/7.0	7	33	230	190	205	200	115
20		LCSY 525-40/7.0	7	44	230	190	205	200	115
21		LCSY 525-50/7.0	7	55	250	205	230	200	120
22		LCSY 525-60/7.0	7	66	250	205	230	200	120

SPECIAL TIPS

Product model, capacitor rated voltage, capacity, reactor ratio, operating frequency, dimension and other parameters should be given when place order. Other sizes can be customized, which depends on customer's requirement.

Active Harmonic Filters (AHF)

1. Model Illustration

SYICD – APF – 0.4 / □ – 3P4L – □ □

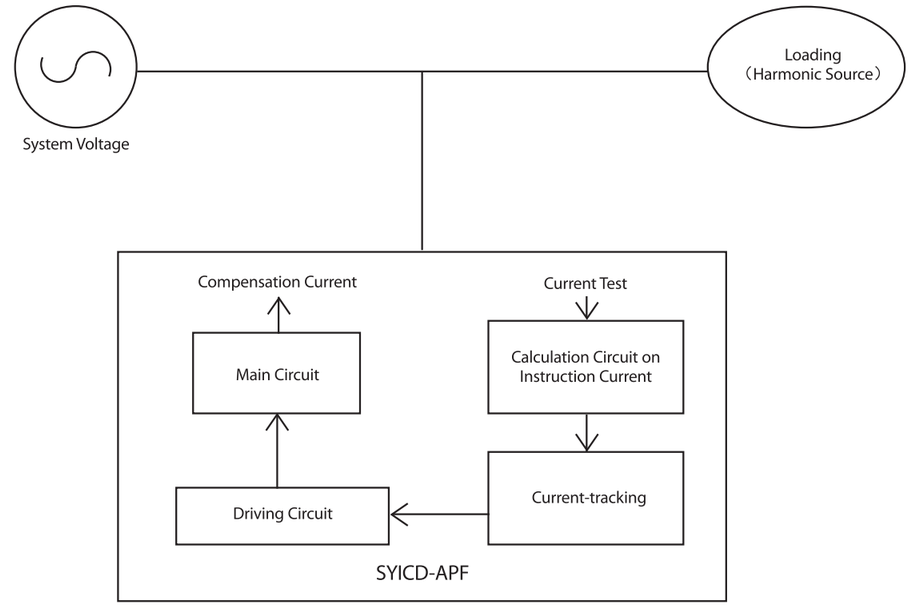
- Blank-Standard type S-S type
- A-Cabinet type
BD-Wall hanging type
CD-Drawer type
- 3 phase-4 line(3P4L)
- Rated current
- Rated working voltage
- Active power filter
- Model

2. Product Introduction

SYICD- APF (Active Power Filter) is a new kind of electric device being used to restrain harmonics and reactive compensation, which can overcome those disadvantages of conventional harmonics suppression and reactive compensation from LC filter. It is available to provide compensation for the changeable harmonics and reactive power. Simultaneously, SYICD-APF, as the first-choice device to optimize power quality, adopted advanced controlling technology and obtained the realization of full-automatic control as well as the model experimental report and test report by authoritative agencies.

3. Working Principle

APF, as a new type device which is dedicated to eliminating electrical harmonics, is adopted modern power electronic technology and DSP Technology (digital signal processing technology) which is based on the high-speed DSP units. It mainly consists of two parts: calculating circuit in directive current and generating circuit in compensation current. Calculating circuit tests the current in full-time, and converts the analog current signal into the digital signal, sends it to DSP to process, separate harmonics from fundamental waves. Moreover, by means of PWM signal, APF sends driving pulses to the generating circuits, drives IGBT power modules to generate compensation current which is equal to the harmonic current but has the opposite polar into power network, to compensate or counteract the harmonic current so as to eliminate the power harmonic initiatively.



4. Product Features

- Extensive filter range: 2~50 harmonics controlled concurrently or compensate specifically.
- Comprehensive protection to improve the stability of application for consumers.
- Independent from the power grid and system impedance, the automatic inhibition to overloading and no risk about harmonic oscillation.
- Versatility: can be used into harmonics treatment, reactive compensation and three-phase unbalance concurrently.
- Adopt module design, easy to expend, simple and flexible to apply, convenient to install and maintain, can be also matched with other electric system.
- Rapid response time, harmonic compensation current full-response time is less than 10ms.

5. Technical Parameters

Technical Index	Specific parameter
Working voltage	380 ± 20%
Working frequency	50/60Hz
Wiring type	3P4L
Filter range	2~50 frequency
Filter efficiency	Available to 90%
Full-response time	＜10ms
Reactive compensation	Available
Target power factor setting	Can be set
Protection type	Short circuit, under voltage, over voltage, over current protection and so on.
Cooling way	Forced air cooling
Machine efficiency	⩾97%
Noises	＜65dB
IP protection grade	IP20 (can be customized)
Working environment temperature	-5~40℃
Working environment humidity	90%RH, no condensation
Storage environment temperature	-40~70℃
Altitude above sea level	⩽2000m; ＞2000m, automatic de-rating 1%/100m
Installation type	Wall hanging type, drawer type, cabinet type
Installation environment	It should be indoor installation, no fire, no explosion, no chemical corrosion, no conductive dust and keep away from the vibration

6. Model List

Model (cabinet)	Compensation current (A)	Dimension (W x D x H) mm
SYICD-APF 0.4/50-3P4L-A	50A	800*1000*2200 (Custom-made is available)
SYICD-APF 0.4/100-3P4L-A	100A	
SYICD-APF 0.4/150-3P4L-A	150A	
SYICD-APF 0.4/200-3P4L-A	200A	
SYICD-APF 0.4/300-3P4L-A	300A	
SYICD-APF 0.4/400-3P4L-A	400A	

Model (Wall hanging type)	Compensation current (A)	Dimension (W x D x H) mm
SYICD-APF0.4/50-3P4L-BD	50A	Custom-made (details are provided in the manual)
SYICD-APF0.4/100-3P4L-BD	100A	
SYICD-APF0.4/150-3P4L-BD	150A	

Model (Drawer type)	Compensation current(A)	Dimension (W x D x H) mm
SYICD-APF 0.4/50-3P4L-CD	50	440*575*200
SYICD-APF 0.4/100-3P4L-CD	100	525*625*245
SYICD-APF 0.4/150-3P4L-CD	150	550*670*248

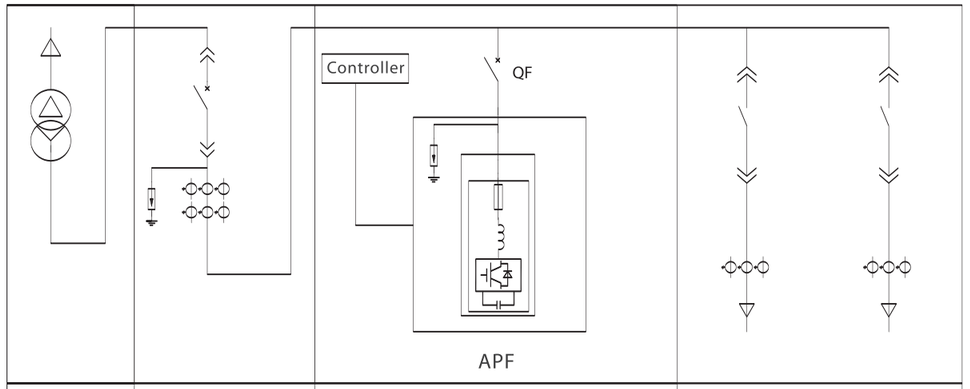
7. Different Industries' THDi Checklist

Industry type	THDi reference	Main harmonic source
Medical industry	15%	Nuclear magnetic resonance equipment, CT, X-ray machine, UPS
Steel industry	30%	Welding machine, cold and hot rolling mill
Petrochemical	35%	Oil pumps, water p, inverter, electric
Office building	15%	Stamping equipment, spot welding machine
Car manufacturing	30%	Crane, motor, VFD
Port, ship building	25%	VFD, motor
Coal industry	25%	VFD, internal mixer, adjustable speed motors
Rubber industry	25%	Central air conditioning, UPS
Public industry	25%	Switching power supply, high power UPS
Communication room	35%	Central air conditioning, energy saving lamps, elevators, computer

8. Nonlinear Load's THDi Checklist

Load type	THDi reference
Switching power supply	40%
Client elevator	30%
Variable frequency air conditioner	34%
Electronic ballast	18%
LED light	20%
Electric welding machine	25%-58%
Medical equipment	30%
Central air-conditioning	15%
Intermediate frequency induction furnace	35%
Three phase UPS	35%
Six pulse rectifier	30%
Six pulse rectifier	15%
Central air conditioning	15%

9. Diagram



Compensation Capacity		300A	
Cabinet Dimension		800x1000x2200mm	
Usage	Incoming cabinet	Active Filter	Outlet cabinet

■ Active Power Filter

Static Var Generators (SVG)

1.Model Illustration

SYICD – SVG 0.4 / □ – 3P4L – □ □

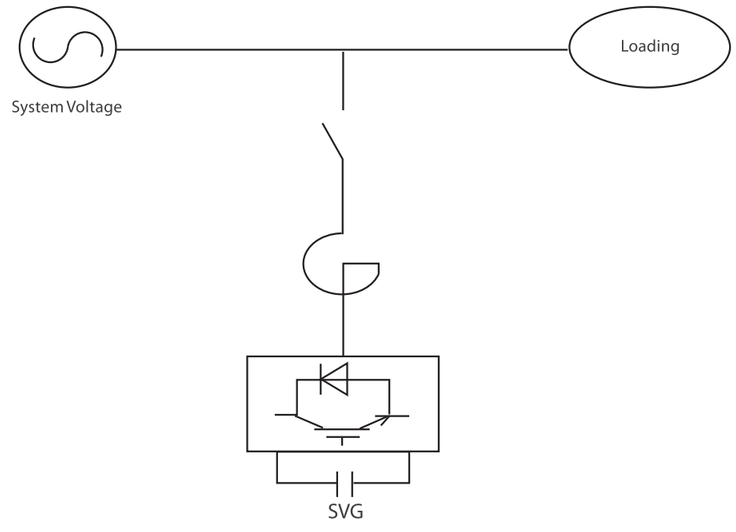
Blank-Standard type S-S type	
A- Cabinet type B-Wall hanging type C-Drawer type	
Static Var Generator Wiring Mode:3P4L	
Rated compensation capacity	
Rated voltage	
Static Var Generator	
Model	

2.Production Introduction

SYICD-SVG is a new type electronic device, adopted to improve low voltage dynamic compensation and three-phase unbalance compensation, which can overcome the disadvantages of conventional capacitor and reactor. It is available to provide compensation for the changeable reactive power. Simultaneously, as the first-choice device to optimize power quality, SYICD-SVG series products employ the advanced controlling technology to realize automatic control, which has obtained model experimental report and testing report from domestic authoritative agencies.

3.Working Principle

SVG, as a new type device which is dedicated to eliminating electrical harmonics, is adopted modern power electronic technology and DSP Technology (digital signal processing technology) which is based on the high-speed DSP units. It mainly consists of two parts: calculating circuit in directive current and generating circuit in compensation current. Calculating circuit tests the current in full-time, and converts the analog current signal into the digital signal, sends it to DSP to process, separates harmonics from fundamental waves, controls PWM signal generator to satisfy rated reactive compensation current basing on the setting value, output driving pulse to compensation current, drives IGBT power module, compensate system reactive current and improves power factor.



4.Product Features

- Intelligent control, maintenance-free, no attended.
- Adopt module design, easy to expend, simple and flexible to apply, convenient to maintain, can also be matched with other electronic system;
- Stable compensation capacity, efficiently maintain the system voltage without any over or under voltage;
- As the converter basing on IGBT technology, SVG is safe and stable enough to suppress harmonics and oscillations.
- Versatility: reactive power compensation and three-phase unbalance can be held simultaneously;
- Extensive compensation range, regulate optionally and switch quickly from capacitor to reactor,
- Fast response speed, reactive compensation response time is less than 10m/s

5.Technical Parameters

Index	Specific parameter
Working voltage	380V ± 20%
Working frequency	50HZ/60Hz
Wiring method	3P4L
Target power factor	Can be set, -1~1
Reactive compensation method	Dynamic continuously and automatically regulate
Full-response time	＜10ms
Three-phase unbalance compensation	Support
Filter function	Can be chose and matched, compensation frequencies is from 2~13
Protection type	Overvoltage, under voltage, short circuit, over current protection and so on
Cooling mode	Forced air cooling
Total machine efficiency	⩾97%
Noise	＜65dB
Working environment temperature	-5℃~40℃
Working environment humidity	90% RH, no condensation
Installation environment temperature	-40~70℃
Altitude above sea level	⩽2000m; ＞2000m,automatic derating 1%/ 100m
Installation method	Wall hanging type, cabinet type, drawer type
Installation environment	In door installation, no fire, explosion, chemical corrosion, conductive dust and keepaway from the vibration

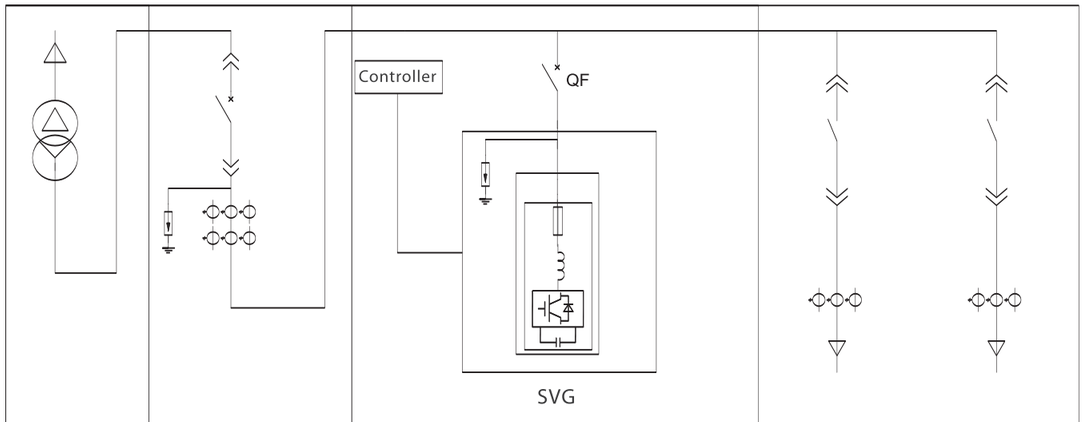
6.Model List

Model(Cabinet type)	Compensation current(kvar)	Dimension (W x D x H) mm
SYICD-SVG 0.4/50-3P4L-A	50	800*1000*2200 (customized is available)
SYICD-SVG 0.4/100-3P4L-A	100	
SYICD-SVG 0.4/200-3P4L-A	200	
SYICD-SVG 0.4/300-3P4L-A	300	
SYICD-SVG 0.4/400-3P4L-A	400	

Model(Wall hanging type)	Compensation current(kvar)	Dimension (W x D x H) mm
SYICD-SVG 0.4/50-3P4L-BD	50	Customized (details are provided in the manual)
SYICD-SVG 0.4/75-3P4L-BD	75	
SYICD-SVG 0.4/100-3P4L-BD	100	

Model(Drawer type)	Compensation current(kvar)	Dimension (W x D x H) mm
SYICD-SVG 0.4/35-3P4L-CD	50	440*575*200
SYICD-SVG 0.4/75-3P4L-CD	75	525*630*245
SYICD-SVG 0.4/100-3P4L-CD	100	600*670*248

7.Technical Parameter



Compensation Capacity		300kvar	
Cabinet Dimension		800x1000x2200mm	
Usage	Incoming cabinet	Static Var Generator	Outlet cabinet

■ Static Var Generator(SVG)