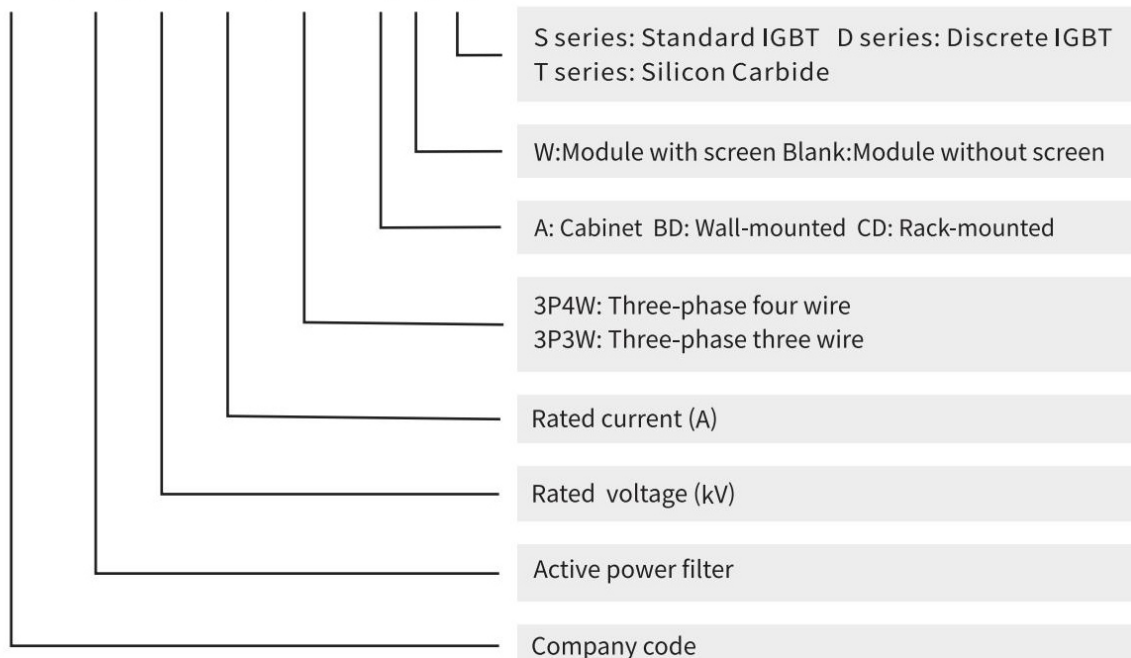


Active Harmonic Filter(APF)



1 Model Description

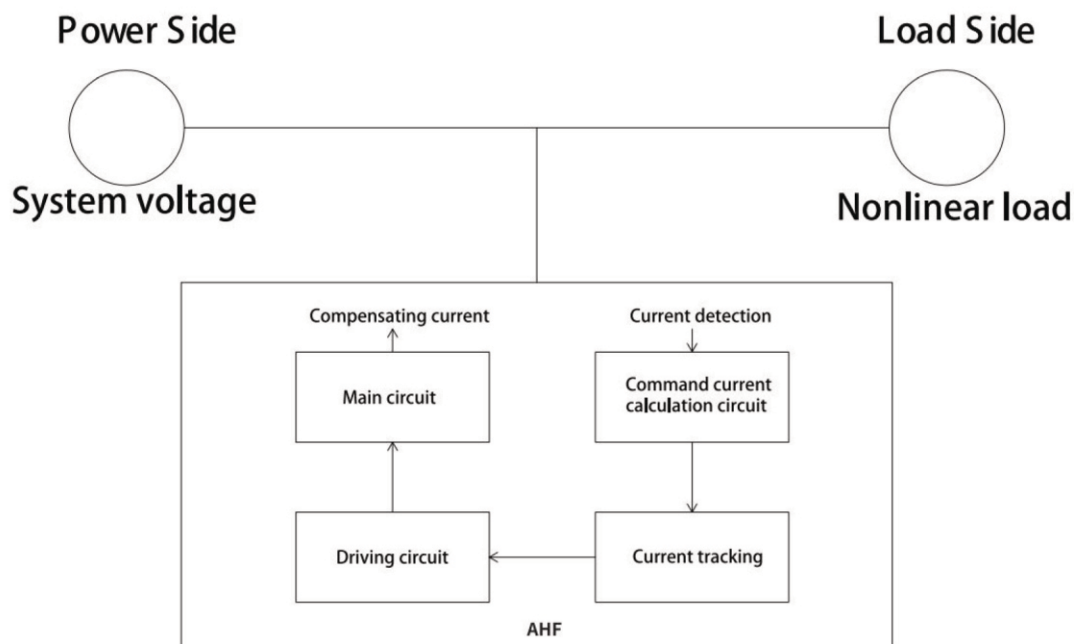
SYICD-APF 0.4/100-3P4W-□□□



2 Product Introduction

SYICD-APF series low-voltage active filter is the latest generation of all-digital harmonic elimination equipment independently developed and launched by Sheng Ye. Compared with traditional technology, it has special advantages. It is faster, smaller, more powerful, easy to install, simple to debug and easy to maintain. These advantages make it easy to solve power quality problems. In addition to dynamically compensating spectral waves, this product can also perform reactive power compensation and solve power quality problems such as voltage fluctuations and flicker. At the same time, this series of products adopts the most advanced control technology to achieve fully automated control, and is the first choice equipment for eliminating harmonics.

3 Working principle



AHF uses power electronics technology. The main components of the equipment include: controller, converter, DC link capacitor, connecting reactor, etc. The control system of AHF includes DSP+FPGA, command current calculation circuit and current tracking control circuit to realize functions such as parameter setting and control command acquisition. The principle of AHF equipment is shown in the figure below:

The AHF detects the load current through the current transformer, and extracts the harmonic components in the load current through internal DSP calculation, and then sends it to the internal IGBT through the PWM signal to control the inverter to generate a current that is equal to the load harmonic current and in the opposite direction. The harmonic current is injected into the power grid to achieve the purpose of filtering.

4 Product Features

1. Good filtering effect, the main components are imported from the original packaging, the design margin is sufficient, the overload capacity is strong, stable and reliable, and the service life is long.
2. The radiation from the power grid complies with electromagnetic compatibility standards.
3. The equipment is independent of the grid impedance and system impedance and is not affected by changes in grid impedance and system impedance. It automatically suppresses overload and has no risk of resonance.
4. The soft start scheme is adopted to eliminate the disturbance to the power grid at the moment of switching on and off. Achieve impact-free start-up on the power grid, automatically detect and track harmonic changes in the power grid, and no need supervision by workers.
5. Fully modular design, with self-diagnosis and self-recovery functions, complete protection functions and operating status records, installation, debugging, maintenance, commissioning and withdrawal will not affect the user's normal power supply.

5 Technical Data Sheet

Technical Parameter Comparison Table				
No	Items	T Series (SiC - Silicon Carbide MOSFET)	S Series (Standard IGBT)	D Series (Discrete)
1	Rated voltage	220V (Can customize) / 400V	220V/400V/690V/800V	400V
2	Input voltage range	-15%~+15%	-15%~+15%	-15%~+15%
3	Single module capacity (A)	50 / 75 / 100 / 150	50 / 75 / 100 / 150 / 200	50 / 75 / 100 / 150 / 200 / 300
4	Frequency (Hz)	50/60(-10%~+10%)	50/60(-10%~+10%)	50/60(-10%~+10%)
5	Harmonic range	2~50 orders, can choose single option	2~50 orders, can choose single option	2~50 orders, can choose single option
6	CT Installation	Open loop or closed loop (open loop or closed loop, open loop is recommended in parallel case)	Open loop or closed loop (open loop or closed loop, open loop is recommended in parallel case)	Open loop or closed loop (open loop or closed loop, open loop is recommended in parallel case)
7	Response time (ms)	≤5	≤10	≤10
8	Wiring	3P3W/3P4W	3P3W/3P4W	3P3W/3P4W
9	Overload capacity	Can run continuously at 110% rated current and run for 1 minute at 120% rated current	Can run continuously at 110% rated current and run for 1 minute at 120% rated current	Can run continuously at 110% rated current and run for 1 minute at 120% rated current
10	Circuit topology	3-Level	3-Level	3-Level
11	Switching frequency (kHz)	Up to 40	Up to 20	Up to 20
12	Numbers of parallel machine	≤20 modules in parallel	≤20 modules in parallel	≤20 modules in parallel
13	Redundancy	Any unit can become an independent unit	Any unit can become an independent unit	Any unit can become an independent unit
14	Efficiency	≥98.5%	≥97%	≥97%
15	Power factor control	Inductive or capacitive current compensation	Inductive or capacitive current compensation	Inductive or capacitive current compensation
16	Compensation effect	Unbalanced capacitance and power are 100% compensated, capacitance sensitivity is continuously adjustable	Capacitance and sensitivity are continuously adjustable	Capacitance and sensitivity are continuously adjustable
17	Display	1.8" (for Rack mounted) / 4.3" (for Wall mounted)	4.3 inch	1.8" (for Rack mounted) / 4.3" (for Wall mounted)
18	Communication interface	RS485, CAN interface	RS485, CAN interface	RS485, CAN interface
19	Noise level (dB)	<56 max to <69 (depending on module or load conditions)	<60 max to <69 (depending on module or load conditions)	<60 max to <69 (depending on module or load conditions)
20	Altitude (m)	Use with derating when >1500m	Use with derating when >1500m	Use with derating when >1500m
21	Environment temperature (°C)	Working temperature: -25~55, use with derating above 45, Storage temperature: -45~70	Working temperature: -25~55, use with derating above 45, Storage temperature: -45~70	Working temperature: -25~55, use with derating above 45, Storage temperature: -45~70
22	Humidity	5%~95%RH, no condensation	5%~95%RH, no condensation	5%~95%RH, no condensation
23	Protection level	IP20	IP20	IP20
24	Zero-sequence compensation	3 x capacity, >97%	3 x capacity, >90%	3 x capacity, >90%

6 General Model List

Photo	Type	Model (cabinet)	Rated capacity (A)	Dimension (W x D x H) mm
	Cabinet	SYICD-APF 0.4/50-3P4W-A	50	800*1000*2200 (Custom-made is available)
		SYICD-APF 0.4/75-3P4W-A	75	
		SYICD-APF 0.4/100-3P4W-A	100	
		SYICD-APF 0.4/125-3P4W-A	125	
		SYICD-APF 0.4/150-3P4W-A	150	
		SYICD-APF 0.4/200-3P4W-A	200	
		SYICD-APF 0.4/250-3P4W-A	250	
		SYICD-APF 0.4/300-3P4W-A	300	
		SYICD-APF 0.4/400-3P4W-A	400	
		SYICD-APF 0.4/500-3P4W-A	500	
		SYICD-APF 0.4/600-3P4W-A	600	
		SYICD-APF 0.4/700-3P4W-A	700	
		SYICD-APF 0.4/800-3P4W-A	800	
	S series Wall-mounted (Standard IGBT)	SYICD-APF 0.4/50-3P4W-BDW-S	50	378x200x525
		SYICD-APF 0.4/75-3P4W-BDW-S	75	418x200x556
		SYICD-APF 0.4/100-3P4W-BDW-S	100	503x232x611
		SYICD-APF 0.4/150-3P4W-BDW-S	150	573x250x261
		SYICD-APF 0.4/200-3P4W-BDW-S	200	694x250x680
	S series Rack-mounted (Standard IGBT)	SYICD-APF 0.4/50-3P4W-CDW-S	50	359x538x200
		SYICD-APF 0.4/75-3P4W-CDW-S	75	399x626x200
		SYICD-APF 0.4/100-3P4W-CDW-S	100	484*624*232
		SYICD-APF 0.4/150-3P4W-CDW-S	150	554*634*250
		SYICD-APF 0.4/200-3P4W-CDW-S	200	674x715x250
	D series Rack-mounted (Discrete)	SYICD-APF 0.4/30-3P4W-CDW-D	30	230*88*400
		SYICD-APF 0.4/50-3P4W-CDW-D	50	484x487x88
		SYICD-APF 0.4/75-3P4W-CDW-D	75	484x487x88
		SYICD-APF 0.4/100-3P4W-CDW-D	100	544x618x100
		SYICD-APF 0.4/150-3P4W-CDW-D	150	544x618x100
		SYICD-APF 0.4/200-3P4W-CDW-D	200	554x712x200
		SYICD-APF 0.4/300-3P4W-CDW-D	300	554x712x200
	D series Wall-mounted (Discrete)	SYICD-APF 0.4/30-3P4W-BDW-D	30	230*88*400
		SYICD-APF 0.4/50-3P4W-BDW-D	50	440*480*88
		SYICD-APF 0.4/75-3P4W-BDW-D	75	440*480*88
		SYICD-APF 0.4/100-3P4W-BDW-D	100	563*586*100
		SYICD-APF 0.4/150-3P4W-BDW-D	150	563*586*100
		SYICD-APF 0.4/200-3P4W-BDW-D	200	564x200x680
		SYICD-APF 0.4/300-3P4W-BDW-D	300	564x200x680
	T series Rack-mounted (SiC - Silicon Carbide)	SYICD-APF 0.4/50-3P4W-CDW-T	50	484x487x88
		SYICD-APF 0.4/75-3P4W-CDW-T	75	484x487x88
		SYICD-APF 0.4/100-3P4W-CDW-T	100	544x618x100
		SYICD-APF 0.4/150-3P4W-CDW-T	150	544x618x100
	T series Wall-mounted (SiC - Silicon Carbide)	SYICD-APF 0.4/50-3P4W-BDW-T	50	440*480*88
		SYICD-APF 0.4/75-3P4W-BDW-T	75	440*480*88
		SYICD-APF 0.4/100-3P4W-BDW-T	100	563*586*100
		SYICD-APF 0.4/150-3P4W-BDW-T	150	563*586*100

Different industries, THDi quick 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

Nonlinear load' s THDi quick 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%

8 DIAGRAM

