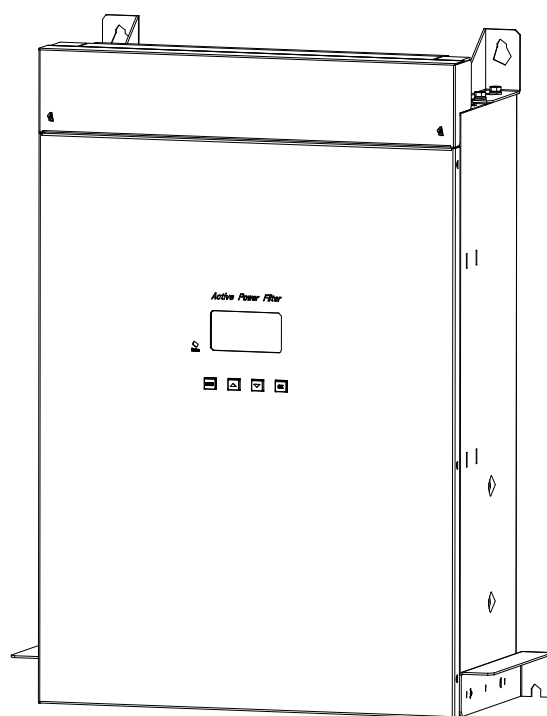


SFR-APF Series Active Power Filter User Manual



JIANGSU SFERE ELECTRIC CO., LTD

Product available in this manual

This manual is applicable to the following types of active power filters of JIANGSU SFERE ELECTRIC CO., LTD.:

	Model	Remark
1	SFR-APF4-50/400 M	50A Active Power Filter Rack Module
2	SFR-APF4-50/400 B	50A Active Power Filter Wall-mounted Module
3	SFR-APF4-100/400 M	100A Active Power Filter Rack Module
4	SFR-APF4-100/400 B	100A Active Power Filter Wall-mounted Module

1. Active Power Filter System

1.1 Principle of Active Filter

Our SFR-APF series active power filters (hereinafter referred to as filters) are shunt active power filters. Harmonic current is detected from the compensated object, and then a compensating current equaling to the harmonic current with opposite polarity is generated by the filter, thereby eliminating the harmonic current in the power grid, so that the grid current contains only the fundamental wave component. The system diagram is shown in Figure 1-1:

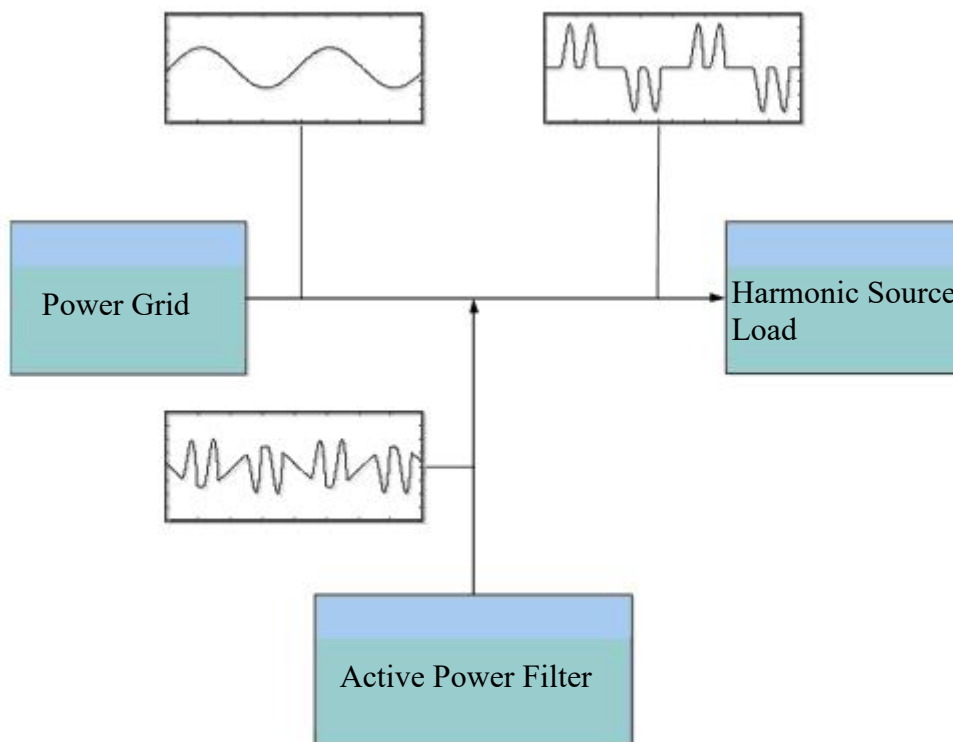


Fig. 1-1 Filter schematic diagram

1.2 SFR-APF Series Filter Features

The SFR-APF series filter adopts the latest generation of semiconductor power conversion devices and a powerful all-digital control platform, making this series of filters achieve industry-leading levels in both product performance and functionality. The main features are as follows:

- With fully independent intellectual property rights, suitable for application in the Chinese market;
- With intelligent resonance elimination function and strong adaptability;
- With fundamental wave reactive power compensation and unbalance compensation function;
- Optional full harmonic compensation or selected-order harmonic compensation;
- With modular design, flexible configuration, multi-machine operation in parallel, easy to expand capacity;
- Intelligent frequency conversion control;
- Accurately eliminate harmonics, with faster compensation.

2. Filter Installation

2.1 Environmental Requirements

Table 2-1 shows the environmental requirements for the storage and operation of SFR-APF series filters:

Table 2-1 SFR-APF series filter environment parameters

Item	Scope
Operating temperature	-10~50°C(Derating when above 40°C)
Storage temperature	-40~70°C
Relative humidity	5~95%, No condensation
Altitude	<2000m
Pollution level	Level II

2.2 Storage Environment Requirements

If the filter need not to be installed immediately, it must be stored in the complete package in the room and the number of filters stacked with the package does not exceed 4 units.

2.3 Handle Filter

2.3.1 Filter Packaging

A graphic description of the precaution is located at the front right corner of the package for the packaged filter, with the specific meanings as follows: keep dry, handle with care, upward, fireproof, recyclable, and maximum stacking quantity.

2.3.2 Unpack and Inspection

1) Remove the filter package

Take out the filter and place it in a flat environment to avoid tilting or impacting the filter. As shown in Fig. 2-1, the hand-held position of the filter is indicated by an arrow.

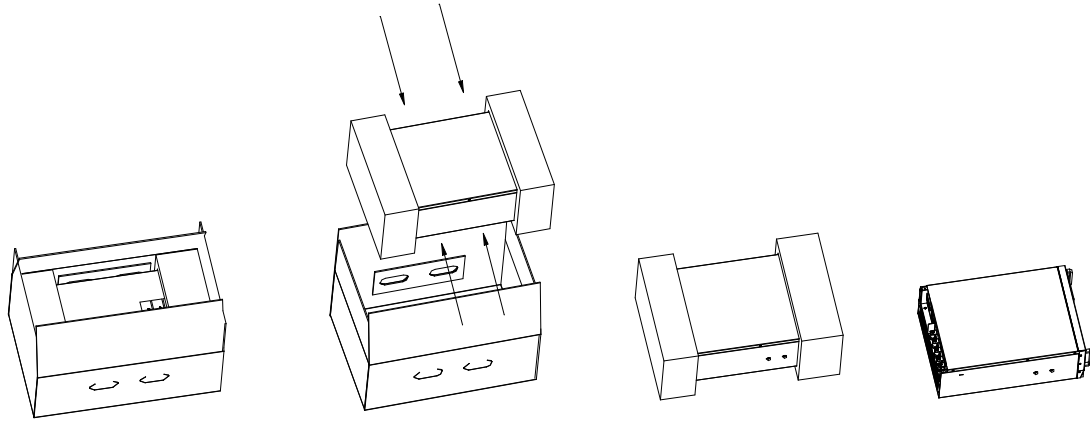
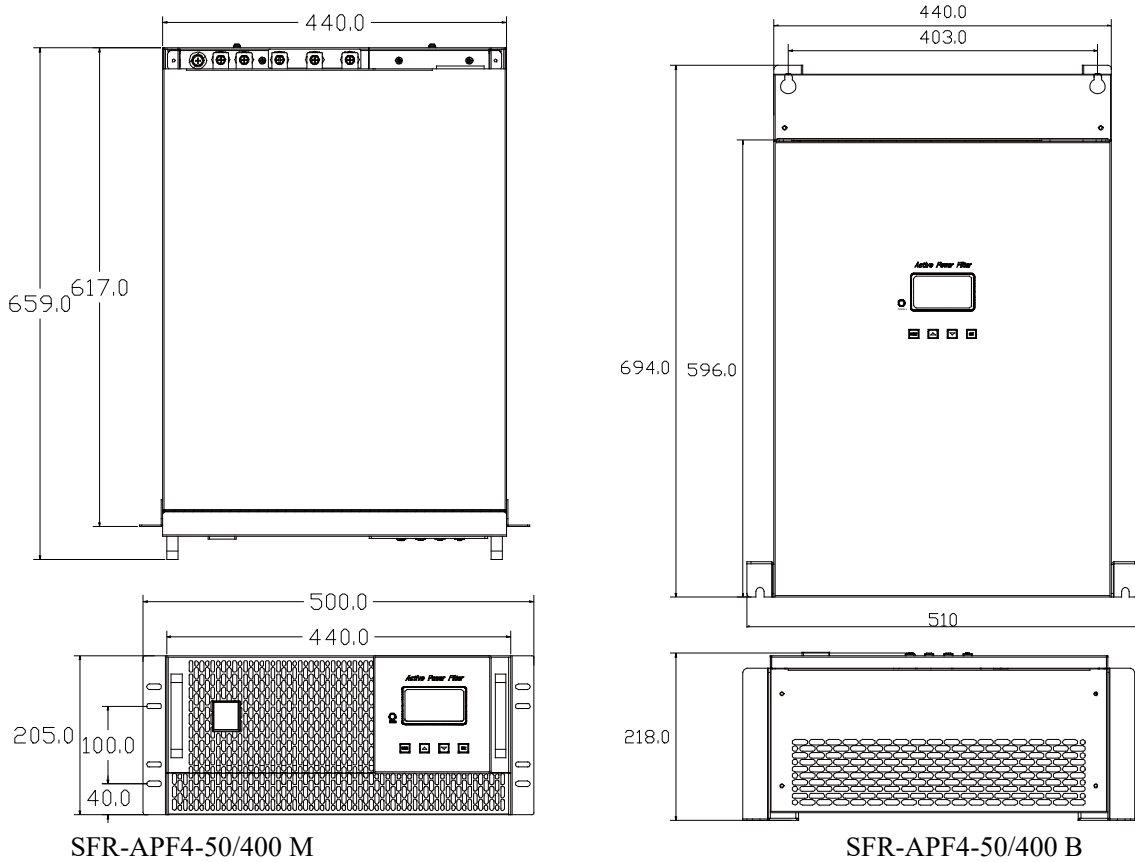


Fig. 2-1 Filter unpacking diagram

2) Check the appearance of filter

Check the appearance of the filter after removing the package. See Figure 2-2 and Figure 2-3 for the appearance of the filter. Filter appearance inspection items should include but not be limited to the following:

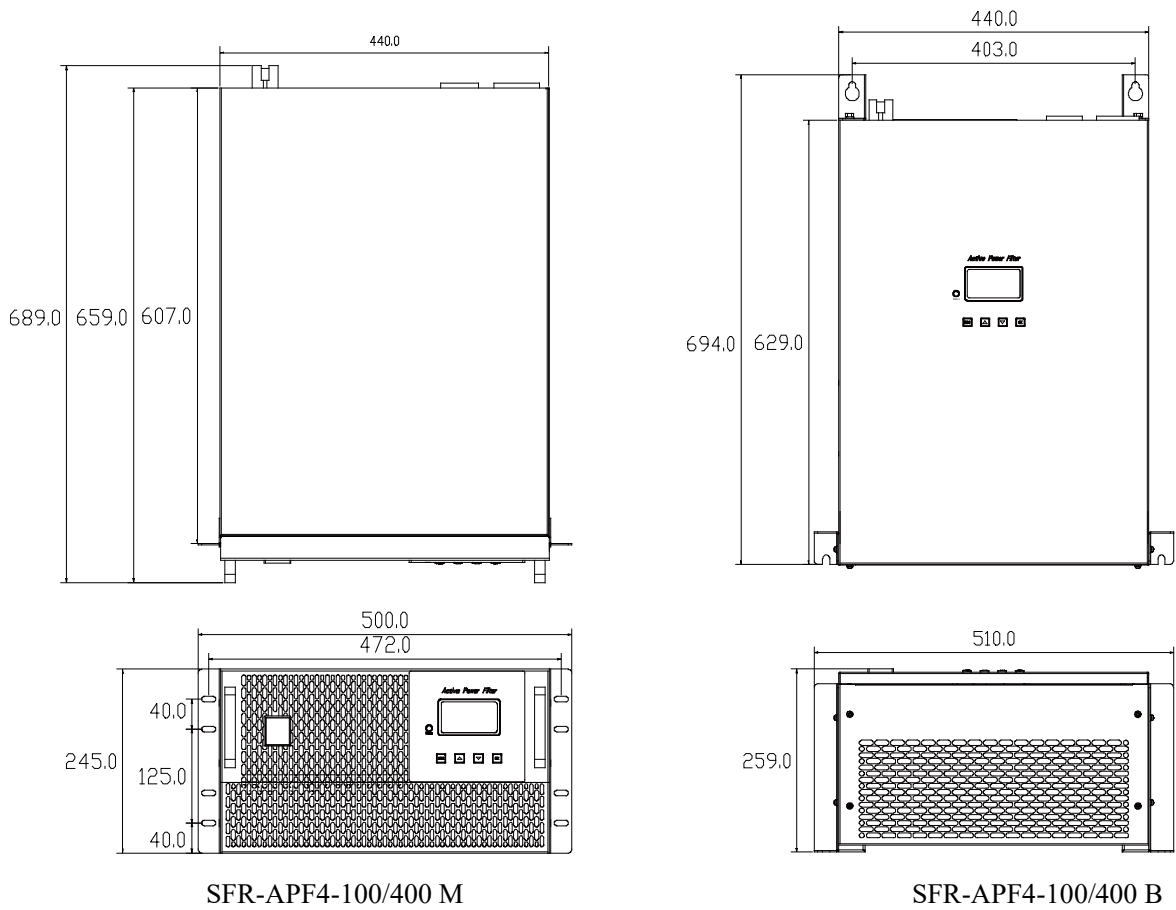
- The appearance should be smooth, without scratches, rust and stains;
- The paint layer on the cover plate shall be free of bumps and color fading;
- No missing or damaged terminal block;
- The LCD screen is not damaged, chipped or peeled off;



SFR-APF4-50/400 M

SFR-APF4-50/400 B

Fig. 2-2 SFR-APF-50 Series dimensions diagram



SFR-APF4-100/400 M

SFR-APF4-100/400 B

Fig. 2-3 SFR-APF-100 Series dimensions diagram

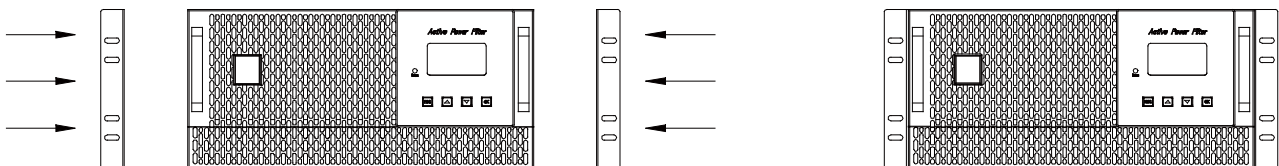
Lift of the shipping accessories can be found in Table 2-1 below.

Table 2-1 List of filter accessories

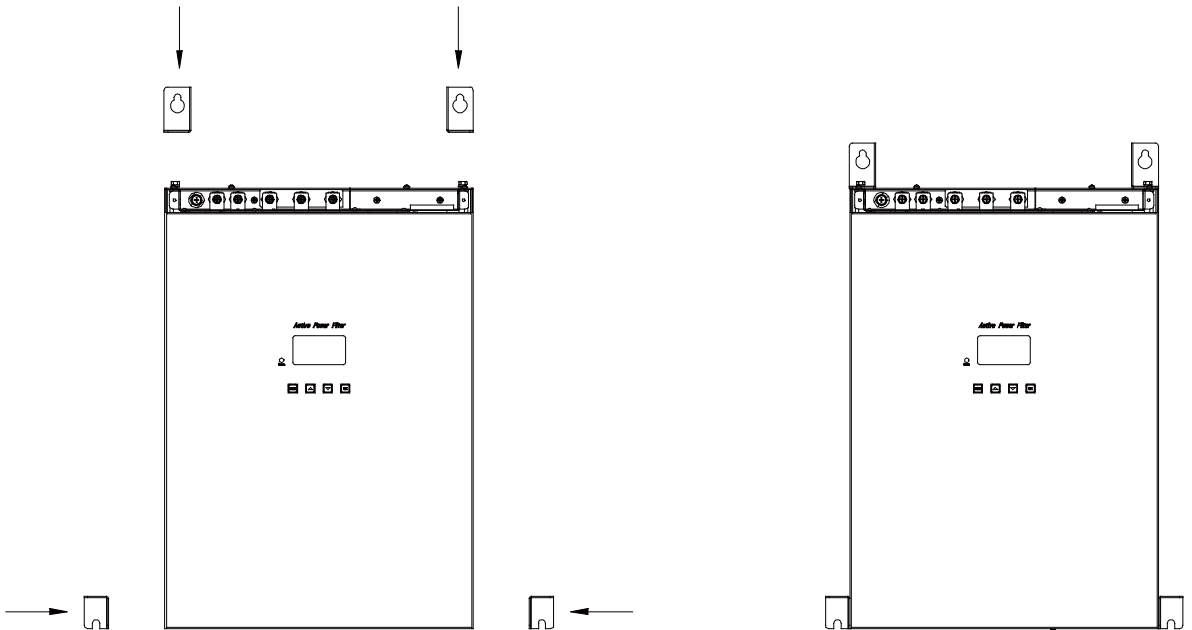
No.	Description	Qty.
1	Product certificate	1 copy
2	Installation accessories	1 copy
3	User manual	1 copy

2.3.3 Install a Filter

Before installing the filter, the mounting accessories shall be installed. The mounting method is shown in Figure 2-4. In the figure, the arrows indicate the installation direction of the screws:



Rack module accessories installation



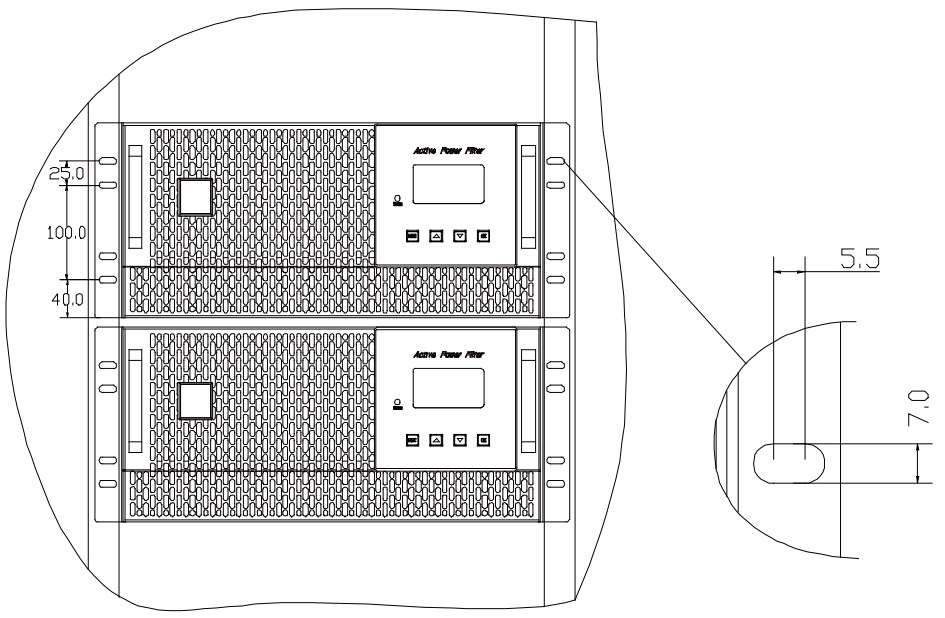
Wall-mounted module accessories installation

Fig. 2-4 Accessories installation diagram

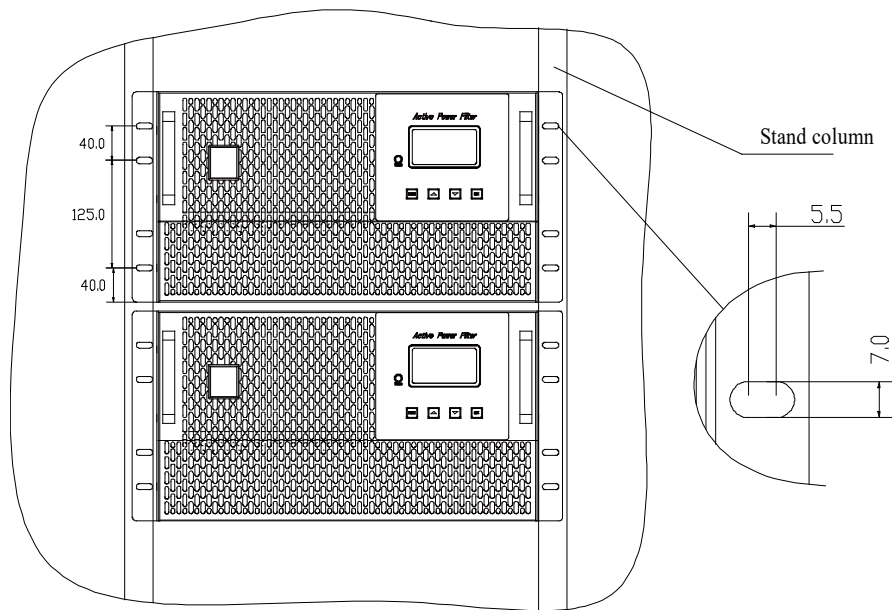
Rack modules and wall-mounted modules are installed in the different fixing way, which will be described separately.

1) Rack module

Rack module needs to be fixed in the cabinet. For details, see Fig. 2-5.



SFR-APF4-50/400 M fixed size



SFR-APF4-100/400 M fixed size

Fig. 2-5 Rack module fixed size diagram (unit: mm)

2) Wall-mounted module

The wall-mounted module needs to be fixed on a hardened wall. Please refer to Figure 2-6 for specific dimensions. M8 *60 expansion screws are used for fixation. After the filter is installed, the bottom of the filter should not be less than 0.8 meters from the ground.

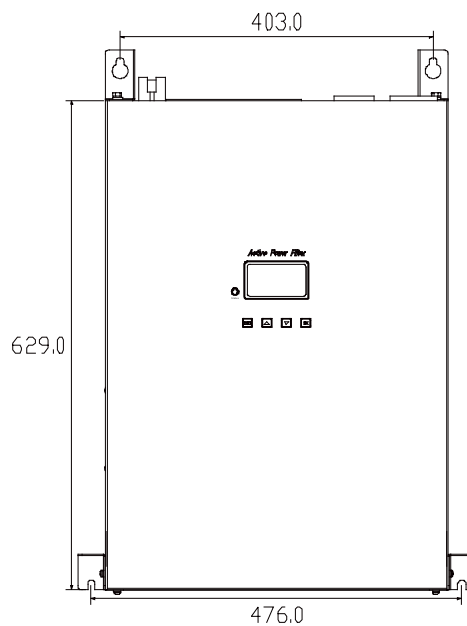


Fig. 2-6 Fixed size of wall-mounted module (unit: mm)

3) Install the multiple wall-mounted modules

As the wall-mounted module belongs to the upper exhaust device, it is strictly prohibited to install the filter in two rows. When parallel installation is required, the distance between left and right is greater than 300mm, and the distance from the bottom of the filter to the ground is greater than 0.8m, as shown in Figure 2-7:

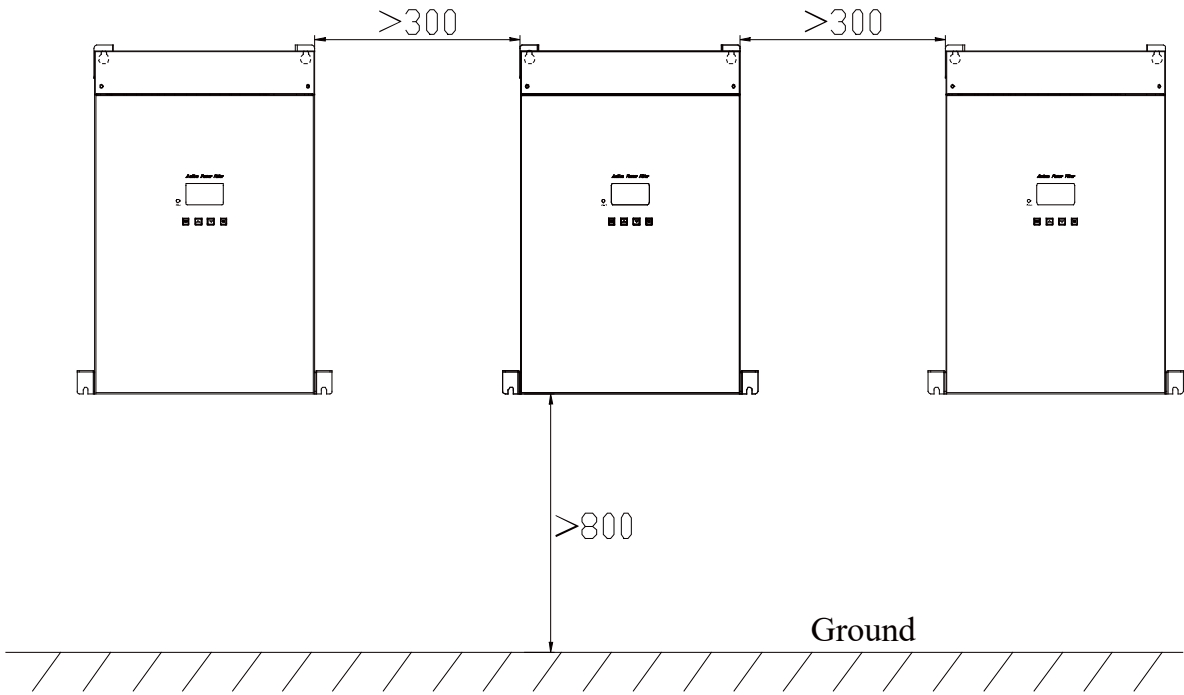


Fig. 2-7 Filter arrangement installation diagram (unit: mm)

3. Product Specifications

3.1 Product Name and Model

SFR-APF 4 - 50 / 400 M

M: Rack-mounted
B: Wall-mounted

System voltage: 400V

Compensation rated current (A)

3: Three-phase three-wire
4: Three-phase four-wire

Active filter product series

For example: SFR-APF-50/400 M means the SFR-APF Series 50A Active Filter Rack Mount Module, with a three-phase four-wire system, a rated harmonic compensation current of 50A and a rated line voltage of 400V.

3.2 Application Standards

The filter design meets the relevant standards:

- JB/T 11067-2011 Active power filter device
- JG/T 417-2013 Parallel Active Power Filtering Device for Building Electricity
- YD/T2323-2011 low-voltage shunt active power filter for communication

3.3 Environmental Conditions

Table 3-1 Environmental conditions

Item	Scope
Operating temperature	-10~50°C (Derating when above 40°C)
Storage temperature	-40°C ~70°C
Relative humidity	5~95%, No condensation
Altitude	<2000m

3.4 Mechanical Features

Table 3-2 Mechanical features

Product model	Dimensions H×W×D (Unit: mm)	Weight (kg)	Colour
SFR-APF-50/400 M	205*500*659	33	ZP7021
SFR-APF-100/400 M	245*500*659	44	
Product model	Dimensions D×W×H (Unit: mm)	Weight (kg)	Colour
SFR-APF-50/400 B	218*510*694	34	
SFR-APF-100/400 B	258*510*694	45	

3.5 Electrical Characteristics

Table 3-3 AC output

Item	SFR-APF-50	SFR-APF-100
Rated input line voltage	380/400/415 Vac	
Input phase voltage range	-20%~20% (415Vac is -20%~15%)	
Frequency	45~55Hz	
Rated output current	50A	100A

Table 3-4 System features

Item	Specification
Overall efficiency	97%
Display operation interface	LCD+ indicator
Insulation resistance	> 10 MΩ (500Vdc)
Insulation strength	(input and output port to ground) DC 2820Vdc, 1min, steady-state leakage current of less than 10mA, no arcing or breakdown
Protection level	IP20
Cooling method	Forced air-cooled
Noise	<65 dBA