SFR-M Series
Low-voltage Harmonic Suppression Reactive Compensation Module

User Manual

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1. Introduction

1. 1. Compliance with standards

GB/T 15576-2008 Low voltage reactive power compensation assemblies

GB/T 22582-2008 Power capacitors—Low-voltage power factor correction banks

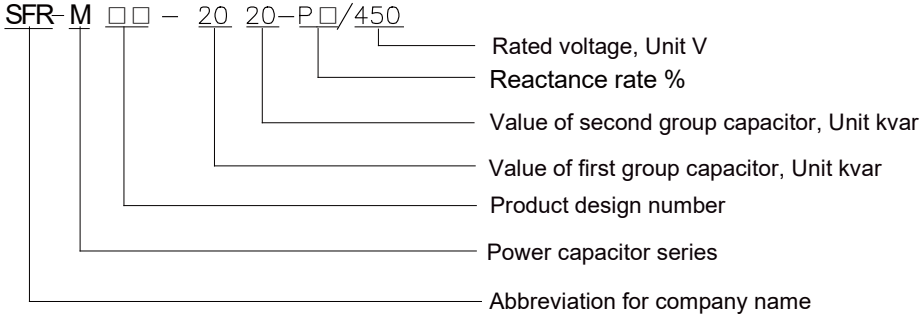
JB/T 9663－1999 Low-voltage reactive power automatic compensation controller

1.2 Overview

SFR-M series low voltage intelligent power capacitor modules take two △ type compensation capacitors or one Y type compensation capacitor as main body and are highly integrated with compound switch, microprocessor and other function modules. Due to their modularity structure, they have such advantages as small volume and easy maintenance. SFR-M series power capacitor modules are mainly used for reactive power compensation in the fields where harmonics are not very serious. They are suitable for local compensation, dispersion compensation and centralized compensation. This series of products adopt double zero-crossing switch technology to make sure there is no over voltage or high inrush current during capacitor switching so as to prolong capacitor life and switch life. SFR-M series capacitor modules have many protection functions such as capacitor internal temperature protection, grid harmonic content protection, over current protection, over voltage protection and three phase unbalance protection which make them more reliable. This series of products adopt a using method of building blocks. If many capacitors are used, one of them will become the master automatically, and others will become slaves. Then a reactive automatic control system is built. If some of the slaves fail,

they will exit the system automatically without influencing other slaves; if the master fails, it also will exit the system automatically, and then another new master appears and a new control system is built. Meanwhile, SFR-M series capacitor modules are integrated with some functions of power meters which can measure conventional electrical parameters of the power system.

2. Model selection



Note: total compensation for rated voltage 480V(P7) or 525V(P14), and separate compensation for rated voltage 280V(P7) or 300V(P14).

Compensation mode	Capacity (kvar)	Remarks
Three phase total compensation	20+20	Two channel total compensation
	20+10	Two channel total compensation
	10+10	Two channel total compensation
	10+5	Two channel total compensation
	50	Single channel total compensation
	40	Single channel total compensation
	30	Single channel total compensation
	20	Single channel total compensation

	15	Single channel total compensation
	10	Single channel total compensation
Phase separate compensation	30	
	20	
	10	

Table 1 Product model list (special specifications can be customized)

3. Technical parameter

Function	Technical parameter	Feature (accuracy)
Measurement	Current	≤0.5 %（within the range 20%～120% of rated current）
	Voltage	≤0.5 %（within the range 50%～120% of rated voltage）
	Power	≤1%
	Power factor	±0.01
Switching mode		Zero-crossing switch
Compensation operation	Working voltage	AC 380V±20%， distortion rate≤5%
	Consumption	≤5VA
	Max. working current	1.35*In
	Switching inrush current	≤ $2\sqrt{2}$ *In
Host protection	Over voltage	1.2*Un （can be set）
	Under voltage	0.8*Un（can be set）
	Harmonic exceeding	0%～100% (can be set)
Local protection	Over current	0～100A (can be set)
	Over	20℃～80℃（can be set）

	temperature	
	Unbalance	0%～200%（can be set, only for total compensation）
Control setting	Control parameter	Target power factor, switching threshold, delay time etc.
	Peripheral unit parameters	Current transformer ratio
Network interface		Pluggable data line, internal network protocol.
Mechanical installation	Outline dimension	280mm×290mm×370(430)mm
	Installation dimension	295mm×350(410)mm
	Weight	≤ 45kg
Environment temperature	Working temperature	-25℃~50℃
	Storage temperature	-25℃~55℃
Altitude		<2000m

4. Installation and wiring

4.1 Outline dimension

Outline dimension Total compensation series	**Length**（L)mm	**Width** (W)mm	**Height** (H)mm	**Distance between fixing poles** mm
SFR-M-2020-P7(14)	430	280	290	295×410
SFR-M-2010-P7(14)	430	280	290	295×410
SFR-M-1010-P7(14)	430	280	290	295×410
SFR-M-1005-P7(14)	430	280	290	295×410
SFR-M-0505-P7(14)	430	280	290	295×410

SFR-M-50-P7	430	280	290	295×410
SFR-M-40-P7(14)	370(430)	280	290	295×350(410)
SFR-M-30-P7(14)	370(430)	280	290	295×350(410)
SFR-M-20-P7(14)	370(430)	280	290	295×350(410)
SFR-M-15-P7(14)	370(430)	280	290	295×350(410)
SFR-M-10-P7(14)	370(430)	280	290	295×350(410)
Separate compensation series	**Length**（L)mm	**Width** (W)mm	**Height** (H)mm	**Distance between fixing poles** mm
SFR-M-30-P7(14)	370(430)	280	290	295×350(410)
SFR-M-20-P7(14)	370(430)	280	290	295×350(410)
SFR-M-15-P7(14)	370(430)	280	290	295×350(410)
SFR-M-10-P7(14)	370(430)	280	290	295×350(410)
SFR-M-05-P7(14)	370(430)	280	290	295×350(410)

Installation hole diameter: Φ6mm

4.2 Installation method

Cabinet size (width*depth*height)	Recommended quantity	Compensation capacity for single cabinet
1000mm*800mm*2200mm	Two layers, 3pcs for each layer	300kvar
1200mm*800mm*2200mm	Two layers, 4pcs for each layer	400kvar

For good heat radiation, make sure horizontal distance between two modules is not less than 50mm, and vertical distance is enough for using screw driver.