# Motor Protection Controller User's Manual

The manual is applied to the products of the

following model:

WDH-31 series

JIANGSU SFERE ELECTRIC CO., LTD.

#### **1. Product introduction**

#### 1.1 Overview

This series of motor protection controller, researched and manufactured by our company, is a protection device for low-voltage A.C motors and is applied to the applicable site of motors with the rated frequency up to 50 Hz, rated voltage up to 690 VAC and rated current up to 800 A. The product has such functions as monitoring, controlling, protection and communication so as to provide the excellent protection to motors..

This series motor protection controller is composed of controller, protection current transformer module and display module. The controller and transformer can be installed integrally or separately.

The controller can work independently, achieving such functions as real-time measurement, protection, motor start and stop control and remote communication. The display module can provide friendly human-machine interface.

Features:

• As the multi- protection function is equipped inside the product, only simple selections are needed to achieve on/off, alarm or trip for the protection function;

• With complete control function such as protection mode, direct starting, Bi-direction staring, bi-speed starting, star/delta starting and autotransformer voltage dropping starting, soft starter staring and transducer starting etc, this product can realize logic exchange among the different control functions through simple selection, featured by flexibility and general purposes.;

• Reasonable starting protection, starting process is automatically identified and the starting current and fault current are distinguished effectively.;

• Anti shake function, low voltage re-start function and self-start function to make sure the uninterrupted working of motor;

•  $4 \sim 20$ mA analog output function equipped inside in this product;

• Record 20 pieces of fault information, 12 digital input position changes, 12 pieces of starting information and 12 pieces of stopping information;

• It adopts LCD interface, as well as visually displays and indicates various parameters, information and states.;

• Seven relay outputs, of which three are control relays and four are signal relays;

◆ 12 channel digital inputs, dry contact and wet contact available;

◆ Standard communication interface, Modbus—RTU and Profibus-DP communication protocols available;

• Modularized design. The major object, transformer, display module and furnished functions of the controller can be put together flexibly;

• With flexible installation and reasonable outline dimension, it can be installed inside one fourth of drawer and holder.





- motor	protection	controller	code
motor	proceeton	00110101101	oouo

Current specifications	Adjustable range	Transformer type	
	or current		
1A	0.2A~1A	SHI01- II , bore diameter $\phi$ 18mm	
2A	1A~2A	SHI02- $\rm II$ , bore diameter $\varphi18mm$	
6.3A	2A~6.3A	SHI06- $\rm II$ , bore diameter $\varphi18mm$	
25A	6.3A~25A	SHI25- $\rm II$ , bore diameter $\varphi18mm$	
100A	25A~100A	SHI100- II , bore diameter $\phi$ 18mm	
250A	100A~250A	SHI250- II , copper bar type connection	
500A	250A~500A	SHI05-II, bore diameter $\phi$ 18mm + 3 external	

		transformer SHI-ZT40 (500A:5A)
800A	500A~800A	SHI05- $\rm II$ , bore diameter $\varphi 18mm+3$ external
		transformer SHI-ZT40 (800A:5A)

### **2.Product introduction**

#### Functions

Control mode	Protection function	Measurement function	Management function	Communication function
Direct starting	Over-load protection	Three-phase current	Input and output status	Modbus-RTU
Bi-direction starting	Rotation-clogging protection	Three-phase voltage	20 times fault recording	Profibus-DP
Bi-speed starting	Current unbalance protection	Power	12 digital input position changes recording	Double Modbus-RTU
Resistor voltage-dropping starting	Open-phase protection	Power factor	12 starting records	
Star/delta starting	Underload protection	Frequency	12 stopping records	
Autotransformer starting	Blocking protection	Electric energy	Present operating time	
Soft starter starting	Residual current protection	Thermal capacity	Present stop time	
Transducer starting	Over voltage protection	Unbalance rate	Accumulated operating time	
Protection mode	Low voltage protection	Positive or negative sequence	Accumulated stopping time	

		current		
Low voltage	Start timeout	Residual	Starting ourrant	
re-start	protection	current value	Starting current	
Power on self start	Under power	Thermal	Starting time	
	protection	resistor value		
	Phase-sequence	4 20m A input		
	protection	4-2011A liiput		
	Temperature			
	protection			
	Analog input			
	protection			
	External fault			
	protection			
	tE time protection			

## 3. Installation and wiring

## 3.1 Outline and Installation Dimension of controller

Integrated type (1A~100A) Guide rail type/ wall-suspending type



Integrated type (250A) Guide rail type/ wall-suspending type



Outline dimension and installation schematic diagram of display module



Connection schematic diagram of contoller noumenon, transformer and display module



## 4. Technical specifications

System working parameter			
Rated voltage of motor	AC380V or AC660V, 50Hz		
Rated current of motor	$0.1\mathrm{A}\sim800\mathrm{A}$		
Insulation resistor	≥100MΩ		
Auxiliary power supply of controller			
Working range	AC/DC 80~270V		
Power consumption	10VA		
Operating environment			
Environment temperature	-20°C~+60°C		
Relative humidity	≤93%RH		
Storage temperature	-40°C~70°C		
Protection degree	controller: IP20 display module: IP66		
	Make sure there is no explosive medium, no gas containing		
Others	corrosive metal and causing insulation failure and no conducting		
	medium in the application field.		
Protection accuracy			
Current/ voltage starting value	±1% of setting value		
Thermal capacity accumulated value	±1% of setting value		
Delayed acting time	When delayed acting value <2s: ±100mS When delayed acting value ≥2s: ±5%		
Control relay output			
Control relay contact capacity	AC250V/8A (resistance), AC250V/5A (AC15)		
Max. breaking voltage	AC400V		
Max. breaking capacity	2000VA		
Signal relay output			
Signal relay contact capacity	AC250V/3A (resistance) DC30V/3A (resistance)		
Max. breaking voltage	AC300V		
Max. breaking capacity	750VA		
Analog input			
Mode	DC 4~20mA		
Thermal resistor input			
Resistance value range	$100\Omega \sim 10000\Omega$		
Analog output			
Mode	DC 4 $\sim$ 20mA , RL $\leq$ 350 $\Omega$		

EMC characteristics		
Electrostatic discharge	Severity level: III	
Electrical fast transient burst	Severity level: III	
Surge	Severity level: III	
Oscillatory waves immunity	Severity level: III	
Electromagnetic compatibility	Severity level: III	
Conducted radio frequency immunity	Severity level: III	
Power frequency immunity	Severity level: A	
Conducted emission limit test	150kHz-30MHz	
Radiation emission limits test	30MHz-1000MHz	
Withstand voltage		
Between power supply and input	AC2kV/1min	
Between power supply and output	AC2kV/1min	
Between input and output	AC2kV/1min	