

# **Motor Protection Controller**

## **User Manual**

**Applied to:**

**WDH-31-580**

**JIANGSU SFERE ELECTRIC CO., LTD**

# 1. Product Introduction

## 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 main module, measuring module, Digital I/O module and display module. The measuring module can realize the measurement for the full electrical parameters, residual current, insulation resistance and the temperature of the motor circuits. The main module can realize the functions such as the motor protection, start-stop control and communicating. The Digital I/O module is used for adding the input and RO so as to realize the more complex logic control. The display module can provide friendly man-machine interaction.

Features:

- ◆ Small size and flexible installation with the modular structural design.
- ◆ Fundamental wave or full wave current measurement and protection is optional;
- ◆ Extra or external residual CT is unnecessary with the internal residual CT in measurement module.
- ◆ Motor insulation resistance measurement is available.
- ◆ Multiple internal protection function, protection function's on-off, alarm or trip function can be programmed.
- ◆ Multiple start-stop control such as direct starting, bi-direction starting, star-delta starting, soft starting;
- ◆ Anti interference electricity, low voltage re-start function and self-start function to make sure the uninterrupted working of motor.
- ◆ 12 channel programmable digital inputs, 8 channel programmable RO;
- ◆ 2 channel programmable analogy output function(4-20mA).
- ◆ Standard RS485 communication interface, Modbus—RTU and Profibus-DP communication protocols available.
- ◆ Multiple SOE record including trip, alarm, start-stop, DI shift

- ◆ 320ms(16 cycle/6 channel) fault recording.
- ◆ Ethernet communication interface with exchanger function is optional.
- ◆ Parameter setting and monitor adjustment can be realized with upper computer equipped.

Application Occasions:

- Single-phase/three-phase low-voltage AC motor
- Motor independtal control cabinet or MCC control cabinet.
- Positive and negative rotating or star-delta staring
- Industrial automatic sites such as conveyer system, dispersing system
- Fire pump or fan

Excutive Standard:

- GB 14048.1-2012 “Low-voltage switchgear and control equipment” general principles.
- GB 14048.4-2010 “Low-voltage switchgear and control equipment” electromechanical contactor and motor starter.
- GB/T 14598.303-2011 Digital motor comprehensive protector general technical requirements.
- Q/320281AKW15-2017 Low-voltage motor protection controller
- GB 3836.3-2010 Electrical Apparatus for explosive gas atmosphere Part 1: AWZD “E”.

## **2.Model selection**



Rated Current Selection Instruction				
Code	Ajustable Range	Applicable motor power(380Vsystem)	Measuring module	Bore diameter
5A	0.2A~5A	0.13~2kW	WM1/05	Φ18mm
25A	5A~25A	2~11kW	WM1/25	Φ18mm
100A	25A~100A	11~55kW	WM1/100	Φ18mm
250A	100A~250A	45~115kW	WM1/250	Copper bar
500A	200A~500A	90~280kW(External CT500A:5A)	WM1/05	Φ18mm
800A	500A~800A	280~400kW(External CT800A:5A)	WM1/05	Φ18mm

Selection Example		
	WDH-31-583A -211/X	WDH-31-582A -321/V /DX
Communication Protocol	2 Modbus	1Modbus + 1 Profibus
Start method	Direct start	Bi-direction start ( Positive and Negative rotating )
Rated Current	25A (5A~25A)	100A (25A~100A)
Rated voltage	AC380V	AC660V
DI/O type	DC24V(passive contact)	DC24V(passive contact)
Optional function	N/A	Anti interference electricity/Low-voltage restart
Optional accessories	Display module	DI/O module ( DC24V input contact ) +Display mode

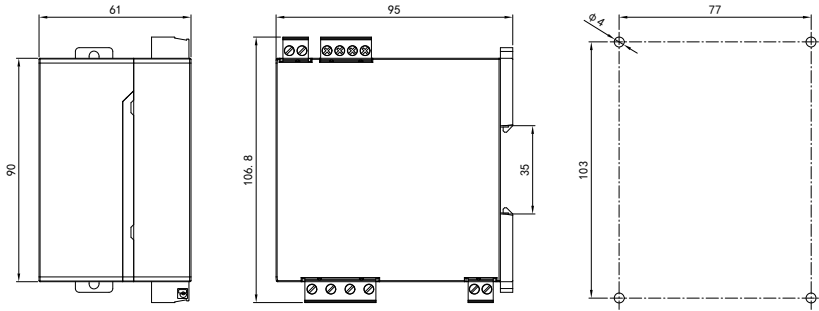
### 3. Installation



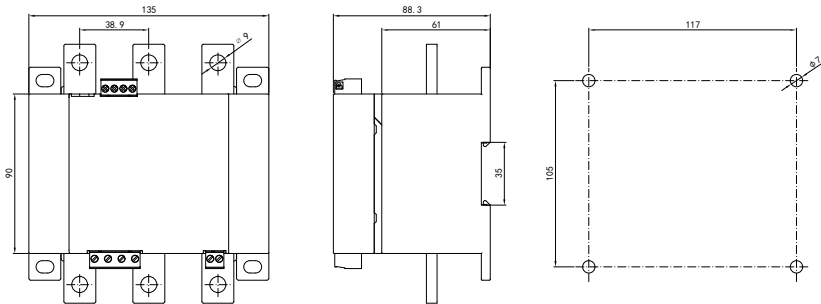
#### 3.1Dimensions

##### 3.1.1Measuring module

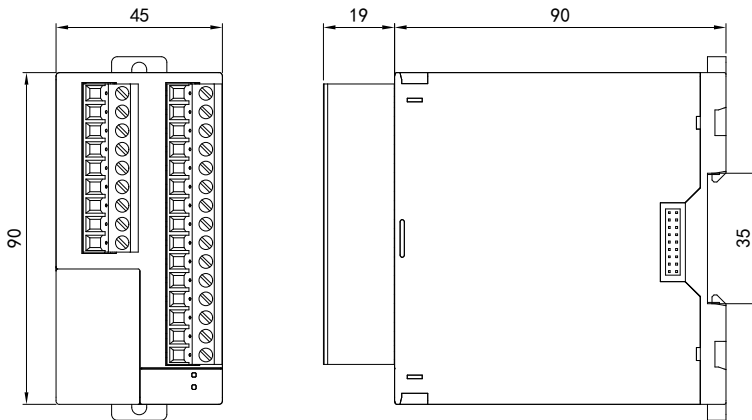
WM1, 5A/25A/100A, perforating connecting method



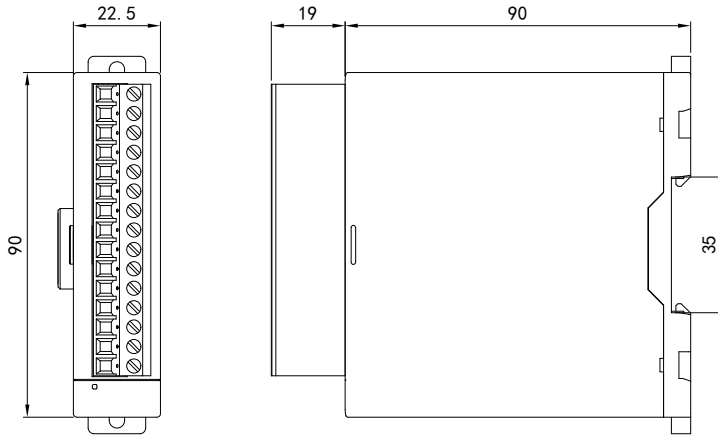
**WM2, 250A, copper bar connecting method**



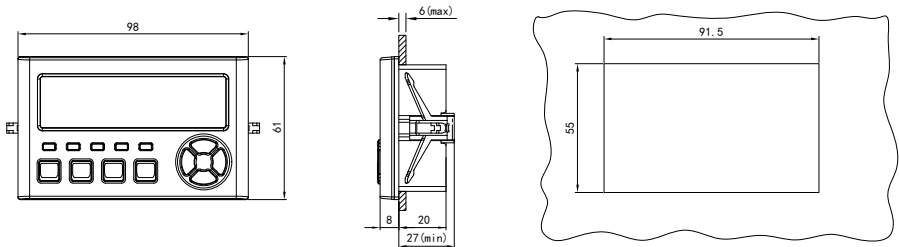
**3.1.2 Main module**



**3.1.3 DI/O module**



### 3.1.4 Display module



## 4. Specifications

system operating parameter	
motor rated voltage	AC380V or AC660V, 50Hz
motor rated current	0.1 A ~ 800 A
Insulation resistance	≥100MΩ
Controller Auxiliary power	
work range	AC/DC 80~270V
Power consumption	10VA

<b>Use environment</b>	
Environment temperature	-20℃～+60℃
Relative humidity	≤93%RH
Storage temperature	-40℃～70℃
Protection level	Main part: IP20 panel: IP64
others	Explosive medium, metal corroding gas and conducting medium are forbidden at site
<b>protection action accuracy</b>	
current/voltage start value	±1% of the set value
aggregate-value of heat capacity	±1% of the set value
Action Delayed time	If the action delayed time is set <2s: ±100mS If the action delayed time is set ≥2s: ±5%
<b>Control Relay Output</b>	
control the contact capacity of the Relay	AC250V/5A (resistive) , AC250V/5A (AC 15)
Max voltage to open	AC400V
Max power to open	1000VA
<b>Signal Relay Output</b>	
contact capacity of the signal replay	AC250V/5A (resistive) DC30V/5A (resistive)
max voltage to open	AC300V
max power to open	750VA
<b>Thermistor input</b>	
Resistive range	100Ω～10000Ω
<b>thermal resistance input</b>	
Resistive range	60Ω～300Ω



<b>AO</b>	
Type	DC 4~20mA , $R_i \leq 500\Omega$
<b>EMC</b>	
Electrostatic discharge	severity: III
EFT	severity: III
Surge	severity: III
Oscillatory waves immunity	severity: III
RFEMS	severity: III
CS	severity: III
Power frequency immunity	severity: A
CE limit test	150kHz-30MHz
RE limit test	30MHz-1000MHz
<b>voltage endurance</b>	
power/input	AC2kV/1min
power/input	AC2kV/1min
Input/output	AC2kV/1min