

**EXPERT** *in intelligent  
control drives*

*Specializing in providing overall solutions for  
industrial automation*



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## Medium and high voltage solid state soft starter

ZYMV standard / all-in-one machine

**ZHYI**



# Focus on industrial automation

Zhongyi Electric regards scientific and technological innovation as the  
source of enterprise development

Intelligent, systematic, and integrated

It is the development direction of Zhongyi Electric's product system

Let customers feel more comprehensively

A new experience brought by Zhongyi Electric's innovation



## About us

Zhejiang Zhongyi Automation Technology Co., Ltd. is a technology-based enterprise in the field of electrical automation focusing on the design, research and development, manufacturing and sales of high, medium and low voltage soft starters and inverter products. We have a group of professional and technical personnel with nearly 15 years of industry experience.

The soft starters and inverters produced by the company are widely used in metallurgy, chemical industry, water conservancy, papermaking, mining, machine tools, mechanical equipment supporting, automation and other fields.



At present, our business covers Southeast Asia, America, Africa, the Middle East and other countries and regions, providing competitive, safe and reliable products and services to global customers.

# Medium and high voltage solid state soft starter

## ZYMV

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### Product Introduction

ZYMV series medium and high voltage solid state soft starter, its voltage covers the range of 3.0kV-11kV, the current covers the range of 30A-1000A, and the power covers the range of 280kW-15000kW, which can basically meet the starting requirements of AC motors in most industrial and agricultural production.

ZYMV series medium and high voltage solid state soft starter uses high-voltage and high-power thyristor components as power regulation and conversion components, so that the product is small in size and low in heat generation, and there is no mechanical transmission mechanism and liquid component in the product, and there is no electromagnetic conversion device. This product has a fast response time, good starting consistency, and almost zero maintenance.

The control core of the ZYMV series medium and high voltage solid state soft starter adopts the current advanced motor control chip - pure 32-bit ARM MCU, which has high computing accuracy, fast response, small size, strong control function and high reliability.

This product adopts Chinese design, intuitive display, easy operation, complete control and protection functions

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### Technical features

- High-voltage thyristor, modular structure and modular design are adopted, which is convenient for the installation and maintenance of the whole machine.
- The thyristor assembly has a self-triggering function in the case of missing pulses.
- One drag more soft up, one drag more soft stop function.
- The starting current is controllable (1.5~4I<sub>e</sub>), and the soft start function is realized, which can avoid the sudden drop of power supply voltage.
- The starting torque is controllable, and the linear and smooth start of the motor is realized.
- For the occasion of heavy load starting, this device has pulse start function (also known as sudden start function).
- It has a soft stop function to prevent water hammer effect.
- It has a direct start function.
- The combination of single-phase optical fiber and electromagnetic trigger technology realizes the isolation between the trigger detection of the high-voltage thyristor and the low-voltage control loop, and the product is safe and reliable.
- It has the function of pre-commissioning of low-voltage (380VAC) motor.
- Parameterization of the debugging process.
- Support multi-point communication of RS-485 remote terminal equipment, embedded standard Modbus protocol, convenient configuration connection.
- Chinese character display function, intuitive and convenient operation.

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### Industry applications

This product can be widely used in AC motors in power systems, machinery manufacturing, building materials, metallurgy, petrochemical, mining, papermaking, thermopower, water treatment and other industries, as a three-phase 3.0kV-11kV medium and high voltage motor start and stop control protection.

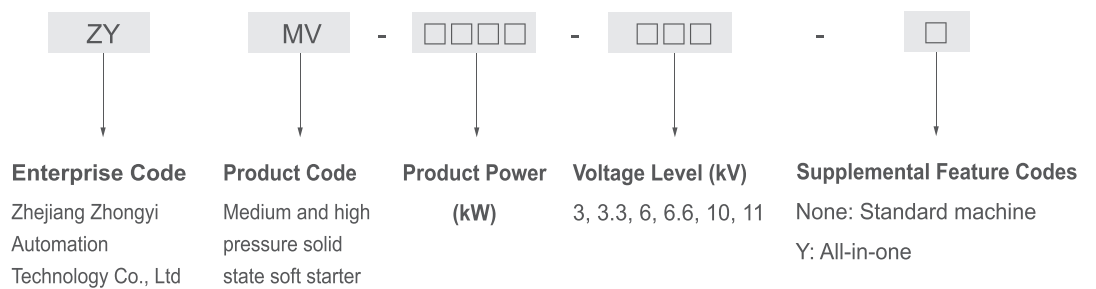
### Conditions apply

- Main circuit voltage: 3.0kV-11kV (+10%, -15% fluctuation allowed).
- Motor type: squirrel cage asynchronous motor, synchronous motor.
- Number of starts: ≤6 times/hour.
- Storage and transportation ambient temperature: -25°C +70°C.
- Operating ambient temperature: the average temperature within 24h is not higher than +45°C, not lower than -20°C; When the operating ambient temperature exceeds +45°C, the specific temperature value should be provided to the manufacturer for derating and selection.
- The altitude ≤ 1000 meters;
- Protection level: IP4X.
- Wiring method: bottom in and bottom out (standard configuration); Other options are available.
- Cooling method: self-air cooling (standard configuration); Other cooling options are available.
- Environment: No fire, explosion, chemical corrosion, serious dust and violent vibration.

### Meets standards

- GB/T11022-2020 《Common technical requirements for high-voltage AC switchgear and control equipment standards》
- GB/T311.1-2012 《Insulation Fit Part 1: Definitions, Principles and Rules》
- GB/T3906-2020 《3.6kV-40.5kV AC metal-enclosed switchgear and control equipment》
- GB/T13422-2013 《Electrical test method for semiconductor converters》
- GB/T3859.1-2013 《Specification of basic requirements for semiconductor alternators》
- GB/T3859.2-2013 《Guidelines for the application of semiconductor alternators》
- GB/T 4208-2017 《Enclosure Rating (IP Code)》
- GB/T14808-2016 《High-voltage AC contactors, contactor-based controllers, and motor starters》
- JB/T10251-2001 《AC motor power electronics soft start device》

### Model description



## Medium and High Voltage Solid State Soft Starter (Standard Machine)

ZYMV





## Features

- The cabinet body adopts standard KYN28 structure, coated with aluminum-zinc plate and metal armor.
- The cabinet should be used with a wire inlet cabinet equipped with a vacuum circuit breaker.
- High and low pressure separation, the cabinet is composed of three parts: relay instrument room, main circuit connection room, and valve group room.
- The cabinet is mainly composed of bypass vacuum contactors, thyristor components, etc.
- Housing protection level: IP4X.

## Technical Notes

1. The bypass vacuum contactor in the high-voltage solid-state starting cabinet is controlled by AC or DC power supply, and the control power supply is connected by the external terminal provided by the user.
2. The required voltage signal in the high-voltage solid-state soft start cabinet is provided by the upper PT cabinet (optional).
3. The high-voltage solid-state starter cabinet is protected with the high-voltage switchgear during the start-up process, and the protection is mainly completed by the high-voltage switchgear after the start-up is completed.

## System diagram of the primary scheme of the standard machine

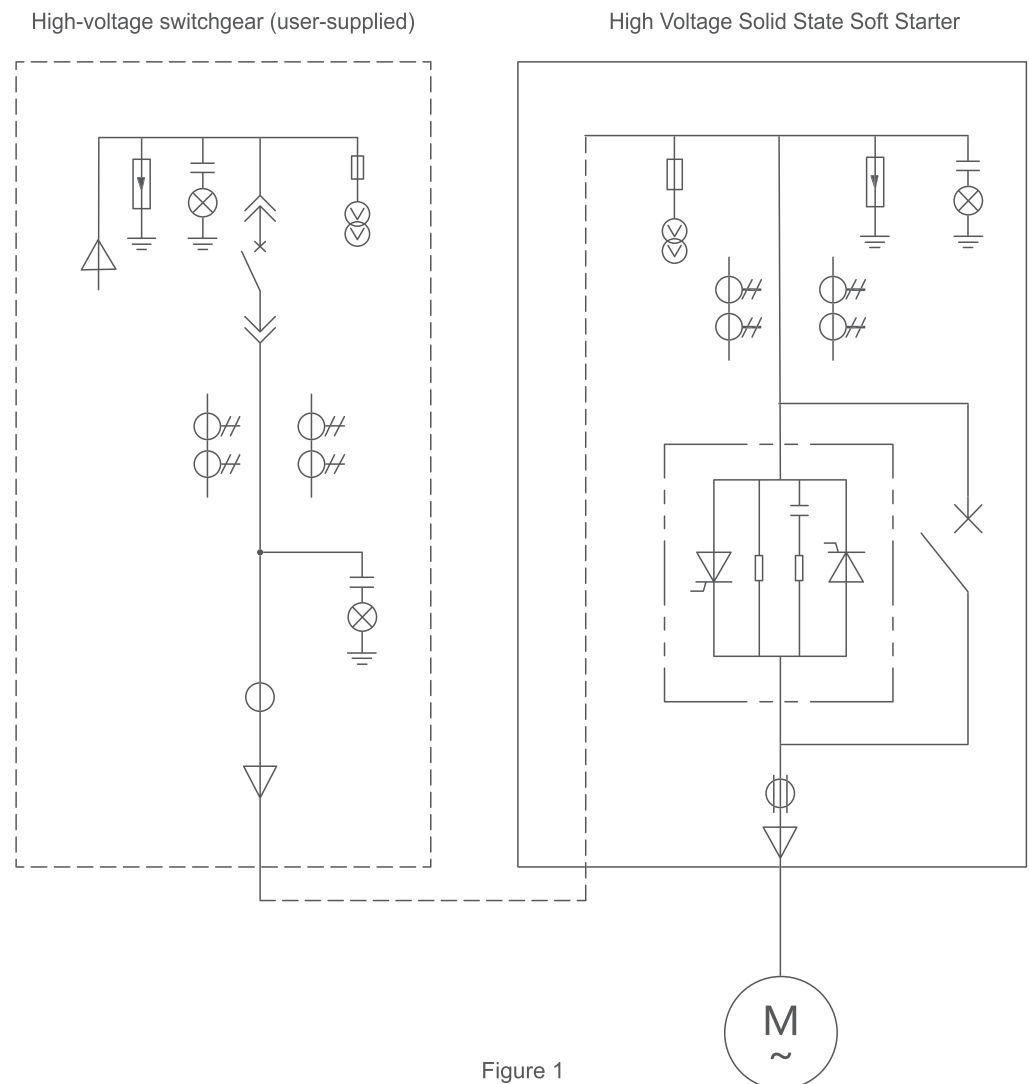


Figure 1

## Medium and High Voltage Solid State Soft Starter (All-in-one machine ) ZYMV-Y



## Features

- The cabinet body adopts standard KYN28 structure, coated with aluminum-zinc plate and metal armor.
- Three-in-one integrated design of soft start cabinet, switch cabinet and bypass cabinet, small size.
- The cabinet is divided into four separate compartments: relay instrument room, busbar isolation room, circuit breaker room, and valve group room.
- The cabinet is mainly composed of vacuum circuit breaker, bypass vacuum contactor, thyristor components, comprehensive protectors, etc.
- Housing protection level: IP4X.

## Technical Notes

1. The vacuum circuit breaker and bypass vacuum contactor in the high voltage solid state starting cabinet are controlled by AC or DC power supply, and the control power supply is provided by the user terminal access.
2. The required voltage signal in the high voltage solid state soft start cabinet is provided by the upper PT cabinet.
3. The high voltage solid state starting cabinet is protected with the high-voltage switch during the start-up process, and the protection is mainly completed by the high-voltage switch after the start-up is completed.

## System diagram of the primary scheme of the All-in-one machine

Medium and High Voltage Solid State Soft Starter (All-in-one machine )

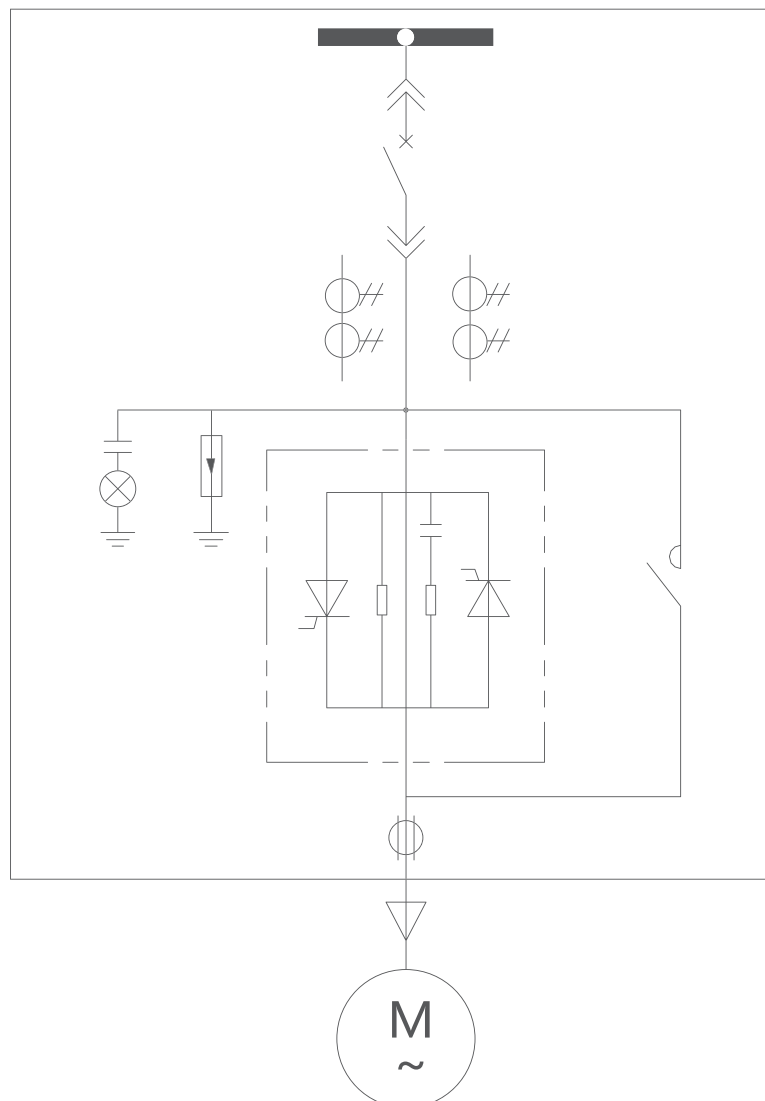


Figure 2

# Medium and high voltage solid state soft starters ZYMV

## How it works

ZYMV series medium and high voltage solid state soft starter is connected in series between the three-phase AC phase voltage and the input terminal of the three-phase AC asynchronous motor, and changes the AC input voltage amplitude of the three-phase asynchronous and synchronous motor by adjusting the delay conduction angle of three independent anti-parallel thyristor valve components at the same time, so as to change the effective value of the three-phase input AC current, so as to achieve the purpose of constant current start or start (stop) according to the curve of a certain slope change. When the start is completed, the output voltage of this product reaches the rated value, for the ZYMV series of medium and high voltage solid-state soft starter, then the three-phase bypass contactor will be automatically controlled, and the motor will be put into the power grid operation as shown in Figure 3, and the waveform of input and output voltage waveforms and current changes will be shown in Figure 4.

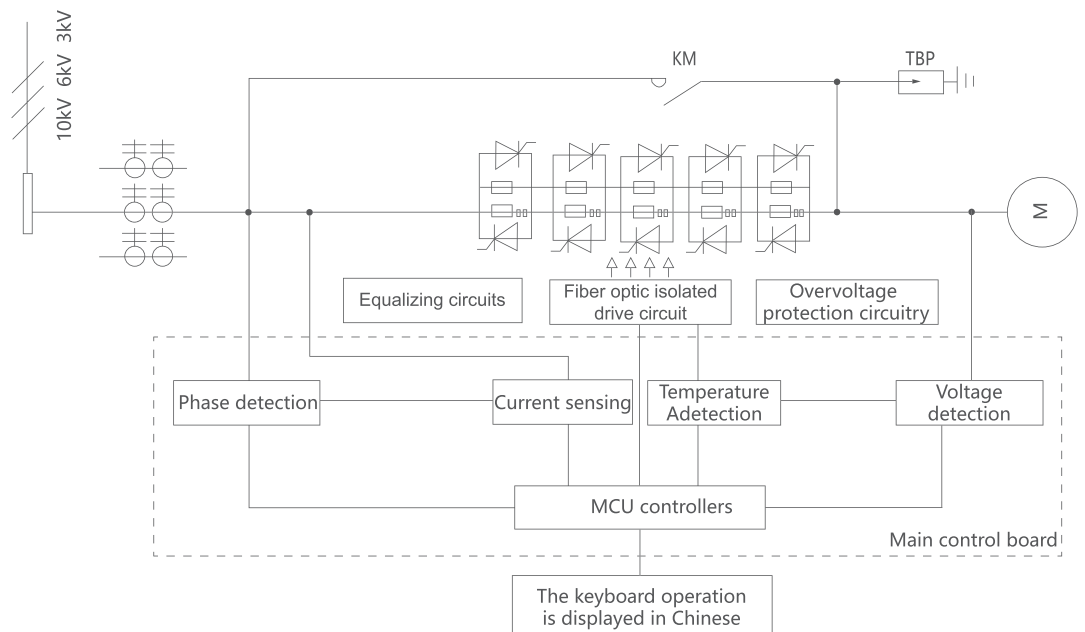


Figure 3

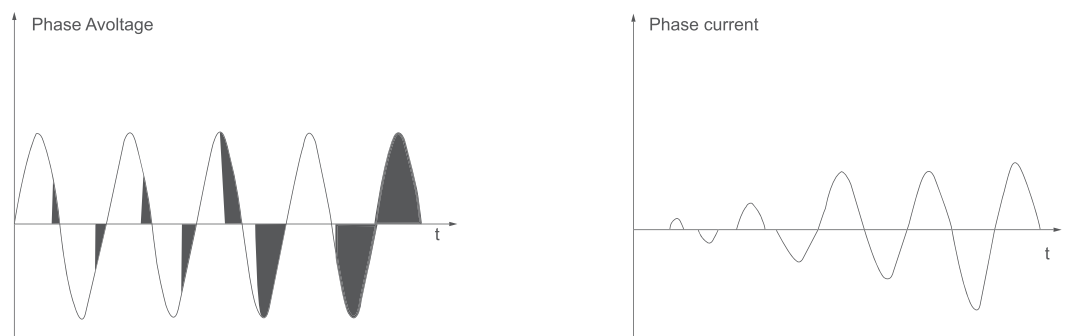


Figure 4

## Main technical parameters

Project	Technical Parameters
Load type	Three-phase medium and high voltage asynchronous squirrel cage motor, synchronous motor
Supply voltage	3.0kV~11kV Allowable Fluctuation +10%, -15%
Mains frequency	50Hz
Power range	280kW~15000kW
Control the power supply	Three-phase 380VAC, 220VAC
Display panel	Chinese or English operation interface
Signal isolation	Fiber optic circuit or magnetic circuit
Cooling method	Natural cooling
Initial voltage	20~100% of the rated voltage is adjustable
Initial current	0~400(500)% of rated current is adjustable
Current limiting start	100~400(500)% of rated current is adjustable
Impulse voltage	20~100% of the rated voltage is adjustable
Pulse time	0.1~3 seconds adjustable
Soft start time	1~90 seconds adjustable
Soft stop time	1~120 seconds adjustable
Energy consumption time	0.1~10 seconds adjustable
Protection features	Overcurrent protection Undervoltage protection Current unbalance protection The bypass does not close the alarm function Phase sequence error protection Motor stall protection
	Overvoltage protection Overload protection Grounding protection Thyristor damage alarm function Phase-loss protection Short-circuit protection
	Undercurrent protection Overheat protection Number of starts protection High-voltage chamber door opening and power-off protection Start timeout alarm function External fault chaining function
Control functions	Current limiting start function Torque ramp start function Multi-group parameter configuration function
	Voltage ramp start function Pump control function Energy-saving operation function (optional)
	Current ramp start function Pulse start function Energy braking function (optional)
Communication features	RS-485 interface with standard Modbus protocol embedded
Gauge display	Displays the three-phase main power supply voltage and three-phase main
Fault logging	Record the last 15 faults
Number of starts	Record the number of starts of this product

# Medium and high voltage solid state soft starter ZYMV

## Selection Table

Voltage(kV)	Current(A)	Power(kW)	Specifications and models	H×W×D(mm)
3	100	400	ZYMV-400-3	2300×1000×1510
	150	630	ZYMV-630-3	2300×1000×1510
	170	710	ZYMV-710-3	2300×1000×1510
	250	1100	ZYMV-1100-3	2300×1000×1510
	320	1300	ZYMV-1300-3	2300×1000×1510
	400	1600	ZYMV-1600-3	2300×1150×1510
	450	2000	ZYMV-2000-3	2300×1150×1510
	600	2500	ZYMV-2500-3	Scheduled
	800	3500	ZYMV-3500-3	Scheduled
6	50	420	ZYMV-420-6	2300×1000×1510
	75	630	ZYMV-630-6	2300×1000×1510
	150	1250	ZYMV-1250-6	2300×1000×1510
	160	1400	ZYMV-1400-6	2300×1000×1510
	200	1600	ZYMV-1600-6	2300×1000×1510
	300	2500	ZYMV-2500-6	2300×1000×1510
	400	3300	ZYMV-3300-6	2300×1000×1510
	500	4200	ZYMV-4200-6	Scheduled
	600	5000	ZYMV-5000-6	Scheduled
10	45	630	ZYMV-630-10	2300×800×1510
	60	800	ZYMV-800-10	2300×800×1510
	90	1250	ZYMV-1250-10	2300×800×1510
	110	1500	ZYMV-1500-10	2300×800×1510
	130	1800	ZYMV-1800-10	2300×800×1510
	160	2250	ZYMV-2250-10	2300×800×1510
	180	2500	ZYMV-2500-10	2300×800×1510
	200	2800	ZYMV-2800-10	2300×1000×1510
	250	3500	ZYMV-3500-10	2300×1000×1510
	280	4000	ZYMV-4000-10	2300×1000×1510
	320	4500	ZYMV-4500-10	2300×1000×1510
	400	5500	ZYMV-5500-10	2300×1000×1510
430	6000	ZYMV-6000-10	2300×1000×1510	
500	7000	ZYMV-7000-10	2300×1000×1510	
600	8500	ZYMV-8500-10	2300×1000×1510	

Note: The size of the all-in-one machine can be consulted by the manufacturer

## Selection guide

Before consulting with the manufacturer, please prepare the following information:

Motor rated power (kW), motor rated current (A), motor rated voltage (kV), load type (pump, compressor, conveyor belt, etc.), altitude, ambient temperature, etc.

Since the motor current is related to the power factor and the number of poles, the quotation will be subject to the rated current of the motor provided by the customer.

# Classic case



PetroChina Tower Southwest natural gas comprehensive utilization project



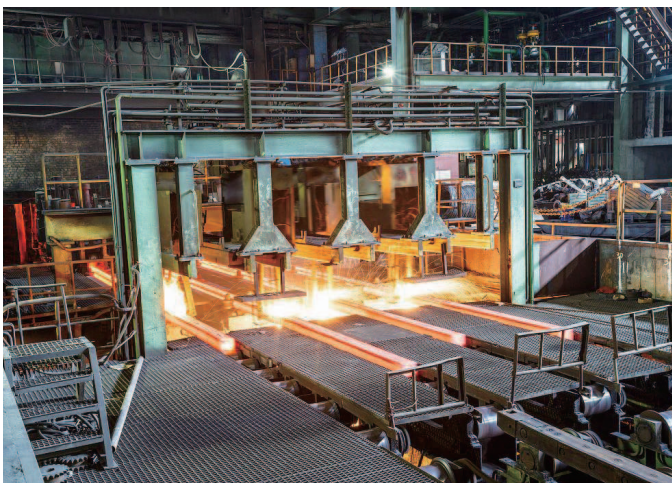
CNOOC Uganda Kingfisher oil field facility project



Anhui section of the South-to-North Water diversion project



Baowu Group



Russia's Novokuznetsk iron and steel company



Vietnam Lao Cai Mineral company

⚠ This sample album is a product of Zhejiang Zhongyi Automation Technology Co., Ltd, due to the continuous innovation of product technology, please refer to the actual product without prior notice.

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