

K-DRIVE

Dedicated to becoming a pioneer in industry system solutions



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SHENZHEN K-EASY AUTOMATION CO.,LIMITED



KSSHA High Voltage Solid State Soft Start
6KV/10KV/Integrated Machine

www.keasyautomation.com

Company Profile

Shenzhen K-Easy Automation Co., Limited is a professional manufacturer, specialize in R&D And production of AC drives. We have built up a comprehensive product family. Frequency inverters' power covers the range from 0.4 to 630kW, and voltage range is between 220V and 480V. More than inverters are running smoothly 300, 000 units at different industrial sites.

Why Us

- ◆ We believe "quality is life", so we will test all products before shipment, All Module of our VFD will be used quality is life with Infineon only, With years of persistence, the total failure ratio of Our frequency inverters has been controlled below 1%. We never lose a customer because of the quality problem;
- ◆ With Strong R&D and Engineer Team, makes our after-service very easy, For all doubts and requesting for technologies supporting, We can offer detailed Solution without delay, so for us, "Not Only Products, But also solutions";
- ◆ All our products will be offered with 24 months Warranty Period instead of 18 months.

Join us, enjoy the business.

Qualifications



Catalog



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Product Introduction

Overview

- AC asynchronous motors are widely used in various fields of the national economy. The direct starting of asynchronous motors has the problems of small starting torque, large starting current, large impact on the power grid, difficulty in starting, large impact on mechanical equipment, short service life of the motor, large maintenance workload, and high maintenance costs.
- KSSHV voltage soft starting can reduce the power grid voltage drop caused by the direct start of the motor. The use of this product does not affect the normal operation of other equipment in the common network, and can reduce the impulse current of the motor, which will cause the local temperature rise of the motor to be too large and reduce the life of the motor. It can reduce the mechanical impact caused by direct starting and accelerate the wear of the transmission machinery. Reduce electromagnetic interference, the impact current will interfere with the normal operation of the electrical instrument in the form of electromagnetic waves, high voltage soft start can start and stop freely, improve work efficiency.
- High voltage soft start devices include KSSHV-6 standard 6kV solid state soft start device, KSSHV 0 standard 10kV solid state soft start device and KSSHV-E series all-in-one high voltage solid state soft start device.
- KSSHV high voltage soft start is suitable for starting AC motors with rated voltage 6-10KV. Products are widely used in large-scale iron and steel, petroleum, chemical, aluminum, fire, mining, sewage treatment, electric power and other industrial fields, can be well used with motor drive equipment. Such as: pumps, fans, compressors, shredders, mixers, belt machines and other mechanical and electrical equipment.



Product Introduction

Executive standard

- GB4208-2008 "Shell Protection Level (IP Code)";
- GB/T3859.2-1993 "Semiconductor Converter Application Guidelines";
- IEC 60470 High Voltage AC Contactors;
- GB/T13422-1992 "Electrical Test method for Semiconductor Power converters";
- IEC 61000 Electromagnetic Compatibility;
- GB/ T3859.1-1993 "Basic Requirements for Semiconductor converters";
- GB/T 12173-2008 "Mining general Electrical Equipment";
- JB/Z102 "Technical Conditions for High Voltage Electrical appliances used in high altitude areas";
- GB 1207-2006 "Electromagnetic Voltage Transformer";
- JB/T 10251-2001 "AC Motor Power Electronic Soft Starting Device";
- IEC 60298 "AC metal enclosed Switchgear and Control Equipment above 1KV and below 52KV";
- GB/T 11022-1999 "High voltage switchgear and control equipment standard sharing technical requirements".

Working process and principle

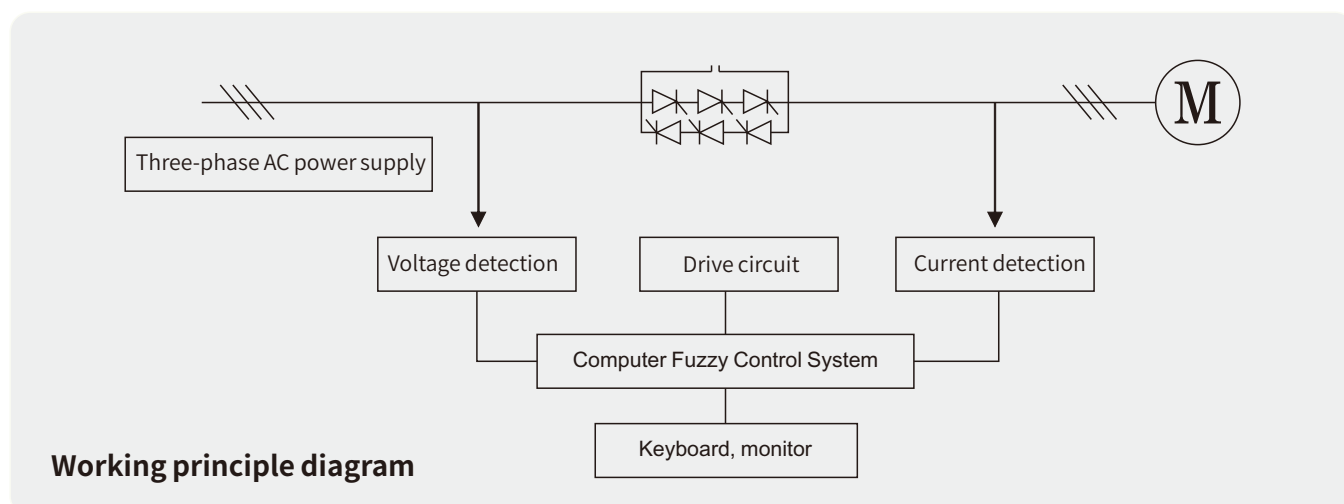
- The operation process of KSSHV high voltage soft starter can be divided into four processes: starting preparation, starting process, running and stopping process. The CPU provides comprehensive protection for all processes.
 - ① Starting preparation is complete: In this process, the control and electrical source have been added to the starter, and its protection includes short-circuit melting of the SCR short-circuit and bypass contactor contacts.
 - ② Other detection protection features:
 - Soft starter temperature rise;
 - Check whether the fuse indicator is on;
 - The phase sequence is correct;
 - Power input frequency tripping range;
 - The external input is faulty.



Product Introduction

Working process and principle

- ② Starting process: When the soft starter receives a starting command, the following protection functions begin to work:
 - Starting curve;
 - Acceleration time;
 - Interphase balance;
 - Circuit short circuit/pre load detection;
 - Interphase leakage;
 - Accumulated starting current;
 - Overload detection;
 - Thermal capacity testing.
- ③ Operation process: When the motor runs at full voltage and speed, the motor current will drop below FLA, and the following protection functions will take effect during operation:
 - Operating overload curve;
 - Lack of phase;
 - Current too low/loss of load;
 - Overcurrent/electronic positioning pin detection.
- ④ Shutdown process: Once the soft starter receives a shutdown command, different protection functions should be selected based on different shutdown methods, as follows:
 - Soft stop mode: will maintain all protective features during operation. At the end of the parking, enter the sliding stop protection state below;
 - Sliding stop mode: The power is immediately disconnected from the motor and restored to "start preparation completed". The following protection functions take effect:
 - Sliding deceleration/rotation deceleration count;
 - Number of starts per hour;
 - Start interval time.



Functional characteristics

Multiple startup modes

Current limiting start, voltage ramp start, current ramp start, current limiting+voltage ramp start+sudden jump, corresponding starting parameters can be selected according to different loads to achieve the best starting effect, making the motor start smoother.

Soft start direct start

The whole machine is designed with a "soft start/direct start" conversion function, and the built-in bypass contactor has the continuity of direct start production.

Protection of thyristors

The resistance capacitance network absorbs dynamic and static voltage equalization technology to ensure the reliable and safe operation of power devices in series under high voltage.

Friendly human-machine interface

Using HMI LCD English display panel makes programming and parameter adjustment more convenient. Fault and real-time monitoring are more intuitive, improving work efficiency.

Diversified entry and exit methods

According to the user's on-site requirements, the cable installation method can be selected as bottom in and bottom out, top in and bottom out, side in and bottom out, and side in and side out

Communication interface (optional function)

Rs485 communication interface, embedded with standard MODBUS protocol, convenient for configuration and connection. Can communicate with the upper computer or centralized control center.



高压固态软启动

Functional characteristics

high reliability

Adopting solid-state high-voltage high-power components, with small volume, low heat generation, fast response, good starting consistency, and less maintenance;

Provide BOD self triggering protection function to reliably protect solid-state high-voltage high-power components;

Provide multiple protection functions such as overcurrent, overload, undervoltage, and short circuit, comprehensively protecting the start, stop, and operation of the motor;

Specially designed electronic overload protection function with power failure memory, which is not affected by the sound of power failure, can replace the protection function of thermal relay.

High security

All electrical isolation between high and low voltage systems adopts fiber optic isolation and magnetic isolation;

Equipped with pre commissioning function for low-voltage (380V) motors;

Adopting standard high-voltage cabinets with five protection functions.

Complete start stop function

Setting the starting current (1.5~5.0Ie) according to the load condition can effectively reduce the starting current and mechanical impact, reduce the distribution capacity, and avoid investment in capacity expansion;

Controllable starting torque, achieving linear smooth starting of the motor, reducing mechanical wear, and improving the service life of transmission equipment;

Stable load acceleration can reduce mechanical impact, prevent production accidents or product damage;

Provide pulse jump start function to cope with heavy load situations with high static friction during starting;

By adopting a soft parking function, the load can be smoothly decelerated and the water hammer effect of pump loads can be eliminated;

Adopting fully digital control, the starting and stopping process is smoother and more stable, with high reliability, suitable for heavy-duty situations in the industrial field;

Practicality

Can achieve a soft start device to control the start stop function of dragging multiple motors; Using HMI panel operation display, the interface is rich, intuitive to use, and easy to operate;

Equipped with standard digital communication interface, it can remotely monitor and operate the soft start device and motor;

The daily maintenance workload is small.

Powerful anti-interference

By adopting multi-level signal processing and isolation technology, a digital trigger with high anti-interference capability is reliably isolated from the high and low voltage of the fiber optic isolation device.

Fault memory

Record 1000 faults to facilitate users in finding the most recent cause of the problem.

Analog signal output (optional function)

The whole machine can provide the transmission of standard 4-20mA signals (pressure, temperature, flow rate, etc.).

Modular design

Adopting high-voltage power thyristors, modular structure, and modular design, it facilitates maintenance of the tiller.

Technical characteristics

Overall structure

The structure adopts the common technical requirements of GB11022-1999-T high voltage switchgear and control equipment, and applies sealing treatment in the cabinet to reduce the pollution inside the machine, and the layout is reasonable. The advanced digital trigger system connects the low pressure control to the high voltage section via optical fiber, and the convenient service design allows each phase module to be replaced quickly and individually. For operational safety, the high pressure and low pressure parts are completely separated.

Unit differentiation

The overall structure of the QDS is divided into three mutually insulated parts. The high voltage circuit is composed of high voltage thyristor module, thyristor protection component, vacuum switch component, etc. Thyristor trigger and signal acquisition and system protection unit composed of optical fiber trigger component, signal acquisition and protection component; System control and human-computer interaction unit composed of system control and display components; The three units are insulated from each other to achieve reliable isolation between high and low pressure. The power cables can be routed from the top or bottom of the cabinet. Leave enough space in the cabinet for the power cables to be routed and the motor cables to be routed from the bottom of the cabinet.

Thyristor module

The thyristors with the same parameters in each phase are installed together in series and parallel. The number of SCR series selected varies according to the peak voltage requirements of the grid used.

Thyristor protection component

It mainly includes overvoltage absorption network composed of RC network and voltage balancing protection network composed of voltage balancing unit.

Signal acquisition and protection components

The main circuit voltage and current signals are collected by voltage transformer, current transformer and arrester, and the main CPU controls and protects them accordingly.

System control and display widgets

32-bit ARM core microcontroller executes central control, HMI LCD display, can display three-phase voltage, current, fault information, operating status, etc.

Technical characteristics

Optical fiber trigger unit

The strong trigger pulse circuit is used to ensure the consistency and reliability of the trigger. Reliable high and low voltage isolation with fiber trigger.

Ground wire

To ensure the reliable running of the KSSHV, the ground cables of each control unit in the cabinet are connected to the ground copper bar at the lower part of the cabinet.

Maintenance-free

Thyristor is a contactless electronic device, which is different from other types of products that require frequent maintenance of liquids and components, etc., turning the mechanical life into the service life of electronic components, and running continuously for several years without downtime.

Easy to install and use

KSSHV is a complete motor starting control and protection system that can be put into operation when installed by connecting the power and motor lines, allowing the entire system to be electrically tested using low voltage before high voltage operation.

Standby characteristic

- The unit is equipped with a vacuum contactor that can directly start the motor. If the KSSHV fails, the vacuum contactor can be used to directly start the motor to ensure the continuity of production.
- High voltage thyristor is the main circuit component, and has voltage equalizing protection and overvoltage protection KSSHV protection system.
- The KSSHV is equipped with an electromagnetic locking device to prevent straying into the high voltage unit under live conditions.

Vacuum switch unit

After the start is complete, the three-phase vacuum bypass contactor automatically draws, and the motor is put into power grid operation.

Transport regulation

The holes and corners on the cabinet can support the maximum weight of the entire cabinet structure.

- Advanced optical fiber transmission technology to realize the isolation between the trigger detection of the high voltage thyristor and the low voltage control loop.
- Adopt 32-bit ARM core microcontroller to implement central control, real-time and efficient control, intuitive display, high reliability and good stability.
- Touch screen display system, user-friendly operation interface.
- With RS-485 communication interface, can communicate with the host computer or centralized control center.
- All circuit boards are subjected to rigorous aging tests.

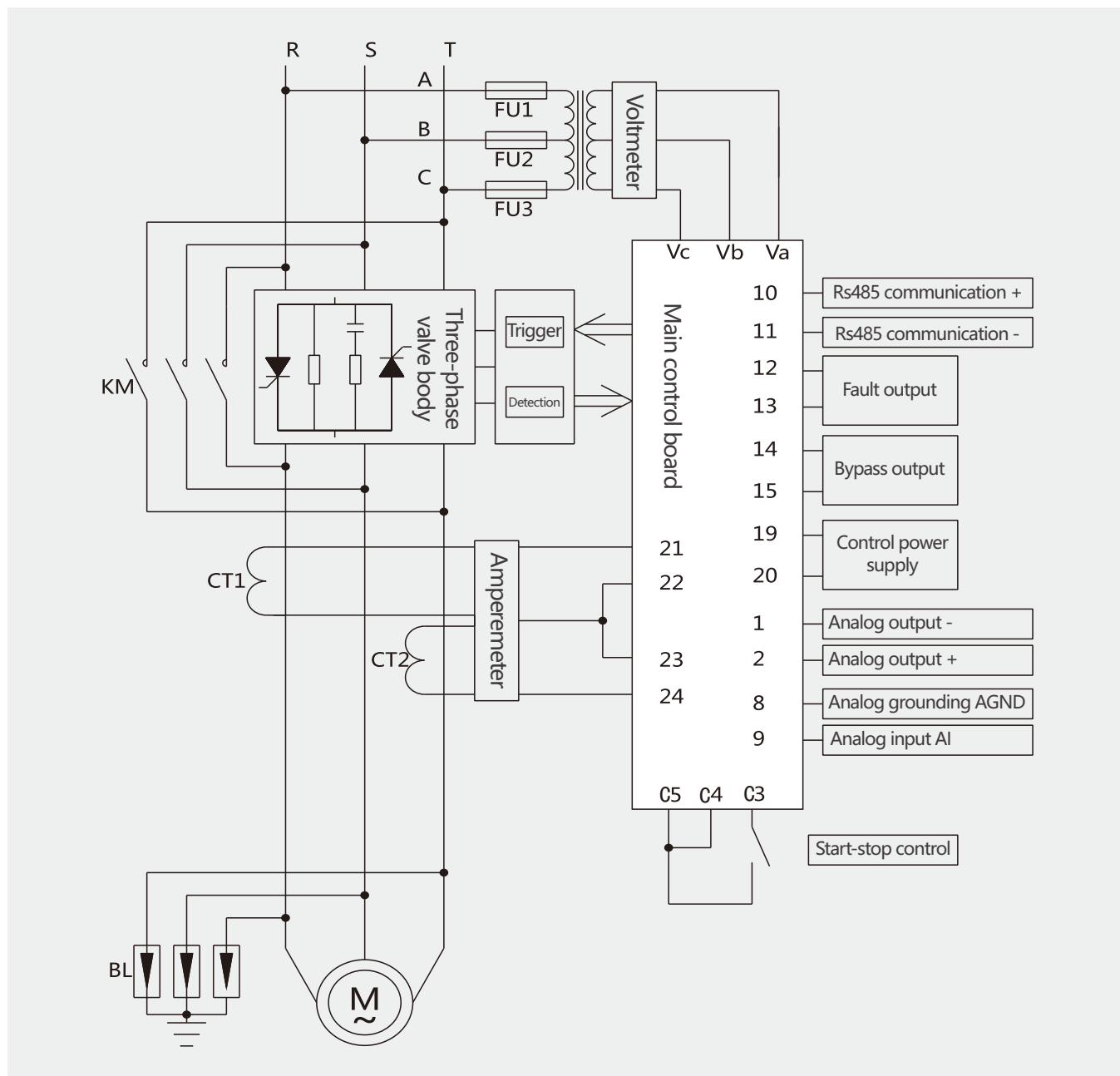
All-in-one features

- The switch cabinet, soft starting cabinet, bypass cabinet three-in-one integrated design, small size, easy to install;
- Standard configuration includes vacuum circuit breaker and bypass vacuum contactor, no need to prepare operating cabinet or switch cabinet, high design costs will never return;
- Small size, the volume of the same power is 50% to 60% of other methods of soft starting, easy installation, space saving;
- The cabinet is made of imported negative aluminum zinc plate, processed by CNC machine tool, completely metal armored, assembled structure, wide combination scheme, advanced multiple flanging process, with rivet nut bolt connection, and high precision, corrosion resistance, light weight, high strength, and strong parts versatility;
- Can be equipped with domestic ZN63A-12(VSI) series or imported VD4 series vacuum circuit breaker, wide applicability, high reliability, to achieve maintenance free;
- All kinds of handcars change according to modular building blocks, to ensure that the same specifications of the car can be freely interchangeable, different specifications can not enter;
- Highly reliable interlocking device, fully meet the "five prevention" requirements;
- Suitable for installation anywhere, with no distance requirement from other equipment layout;
- Pressure relief channels are provided in each high pressure chamber to ensure personal safety;
- The circuit breaker room and cable room can be equipped with heaters respectively to prevent condensation and corrosion;
- The face door is equipped with an observation window to observe the working state of indoor components;
- Protection level :IP40.

Technical Parameter

Item	Basic parameter
Type of load	Three-phase high voltage squirrel cage induction motor, synchronous motor
Alternating current voltage	6-10KVAC
Operating frequency	50HZ/60Hz±2Hz
Phase sequence	KSSHV allows operation in any phase sequence (configurable by parameter)
Bypass contactor	Contactors with direct starting capacity
Control power supply	AC220V±15%
Instantaneous overvoltage protection	dv/dt absorption network
Starting frequency	1-6 times (per hour)
Environmental condition	Ambient temperature: -20°C to +50°C
	Relative humidity: 5%---95% no condensation
	Altitude is less than 1500 meters (more than 1500 meters need to drop capacity)
Operating interface	
Language	Chinese and English
Data recording	
Fault record	Record the latest 100 faults
Protection function	
Phase loss protection	Disconnect any phase of the main power supply during startup or operation
Run overcurrent protection	Overcurrent protection setting: 100 ~ 500%Ie
Phase current unbalance protection	Phase current imbalance protection: 20-100%
Overload protection	Overload protection levels: 10A, 10, 20, 30
Underload protection	Underload protection level: 50 to 100%
	Underload protection operation time: 0-10S
Starting timeout	Starting time limit: 10-120S
Overvoltage protection	Overvoltage protection when the main supply voltage is higher than 120% of the rated value
Undervoltage protection	Undervoltage protection when the main supply voltage is less than 70% of the rated value
Phase sequence protection	Allows operation in any phase sequence (can be set by parameters)
Ground protection	Protection when the ground current is greater than the set value
Communication specification	
Communication protocol/interface	Modbus RTU
Network connection	Each KSSHV can communicate with 32 KSSHV devices
Feature	Through the communication interface can observe the running state, programming
Instrument display	
Main supply voltage	Displays the three-phase main power supply voltage
Three-phase current	Displays three-phase main circuit current

Technical Parameter



KSSHV - X...X - XX - X

① ② ③ ④

①	High voltage soft start model	③	Rated input voltage
②	Adapted motor power	④	G: Fixed E: Integrated

Ordering and Selection

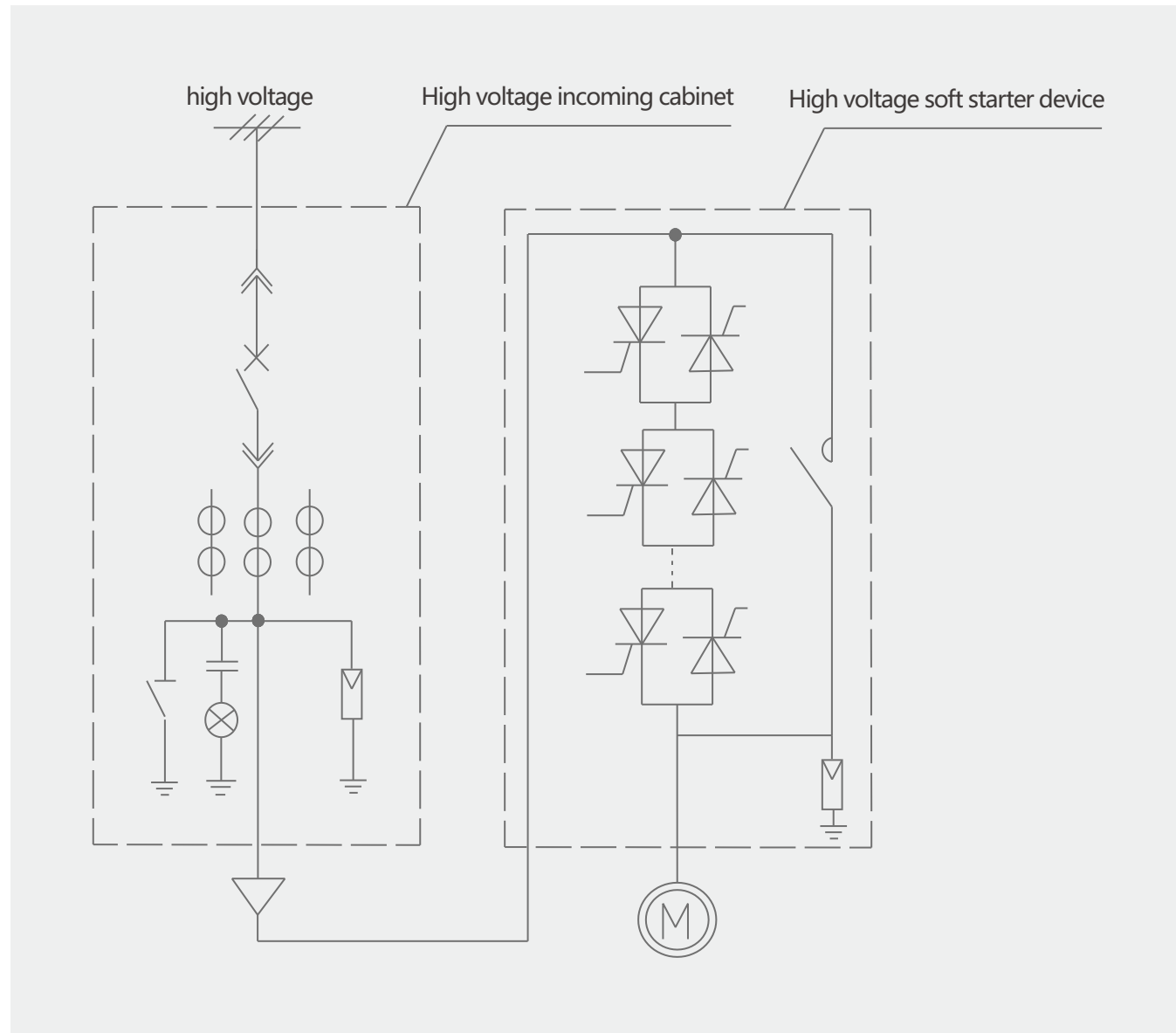
Model	Rated voltage (KV)	Rated power (KW)	Rated Output Current(A)	External dimensions (W * H * D) mm	
				(- G) Conventional models	(- E) Integrated model
KSSHV-420-6	6kV	420	50	1000*2300*1500	1000*2300*1500
KSSHV-630-6	6kV	630	75	1000*2300*1500	1000*2300*1500
KSSHV-800-6	6kV	800	96	1000*2300*1500	1000*2300*1500
KSSHV-1000-6	6kV	1000	120	1000*2300*1500	1000*2300*1500
KSSHV-1250-6	6kV	1250	150	1000*2300*1500	1000*2300*1500
KSSHV-1600-6	6kV	1600	200	1000*2300*1500	1000*2300*1500
KSSHV-1800-6	6kV	1800	218	1000*2300*1500	1000*2300*1500
KSSHV-2250-6	6kV	2250	270	1000*2300*1500	1000*2300*1500
KSSHV-2500-6	6kV	2500	300	1000*2300*1500	1000*2300*1500
KSSHV-3300-6	6kV	3300	400	1000*2300*1500	1000*2300*1500
KSSHV-4150-6	6kV	4150	500	Custom model	Custom model
KSSHV-5000-6	6kV	5000	600	Custom model	Custom model
KSSHV-420-10	10kV	420	30	1000*2300*1500	1000*2300*1500
KSSHV-630-10	10kV	630	45	1000*2300*1500	1000*2300*1500
KSSHV-800-10	10kV	800	60	1000*2300*1500	1000*2300*1500
KSSHV-1000-10	10kV	1000	73	1000*2300*1500	1000*2300*1500
KSSHV-1250-10	10kV	1250	90	1000*2300*1500	1000*2300*1500
KSSHV-1600-10	10kV	1600	115	1000*2300*1500	1000*2300*1500
KSSHV-1800-10	10kV	1800	130	1000*2300*1500	1000*2300*1500
KSSHV-2250-10	10kV	2250	160	1000*2300*1500	1000*2300*1500
KSSHV-2500-10	10kV	2500	180	1000*2300*1500	1000*2300*1500
KSSHV-2800-10	10kV	2800	200	1000*2300*1500	Custom model
KSSHV-3300-10	10kV	3300	235	1000*2300*1500	Custom model
KSSHV-3500-10	10kV	3500	250	1000*2300*1500	Custom model
KSSHV-4000-10	10kV	4000	280	1000*2300*1500	Custom model
KSSHV-4500-10	10kV	4500	320	1000*2300*1500	Custom model
KSSHV-5500-10	10kV	5500	400	1000*2300*1500	Custom model
KSSHV-6000-10	10kV	6000	430	1000*2300*1500	Custom model
KSSHV-7000-10	10kV	7000	500	1000*2300*1500	Custom model
KSSHV-8500-10	10kV	8500	600	1000*2300*1500	Custom model
KSSHV-10000-10	10kV	10000	720	Custom model	Custom model
KSSHV-15000-10	10kV	15000	1080	Custom model	Custom model

Note:

When placing an order, please add the suffix -G or -S after the model to distinguish the ordered model.

Electrical scheme

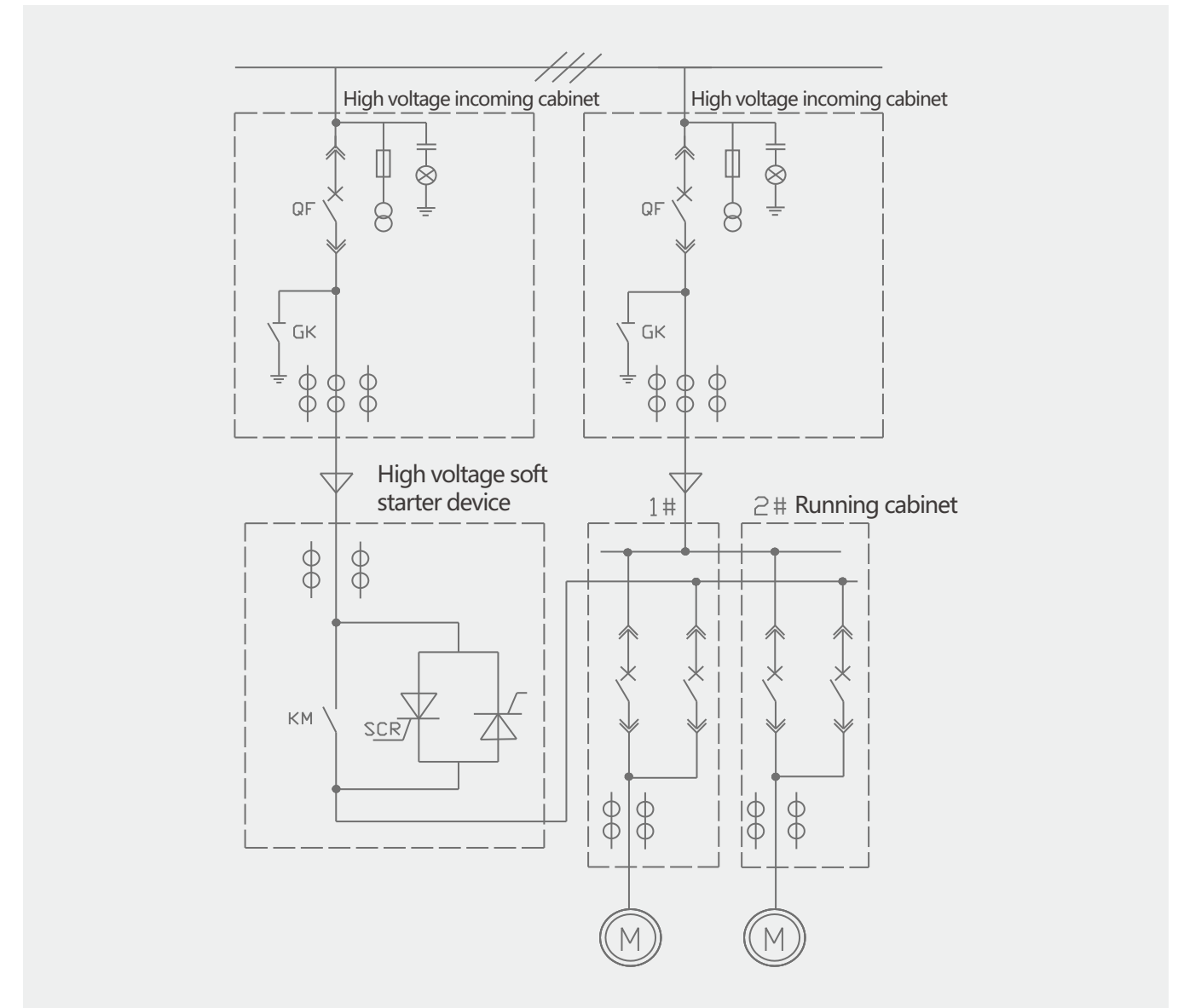
One to One Wiring Diagram



Network communication

This device is equipped with a standard RS-485 communication interface (using MODBUS communication protocol), which can be connected to the factory's automation system, such as PLC and DCS, to achieve integrated automatic control of factory equipment. It can also be connected to remote monitoring computers to achieve remote intelligent control.

One to two scheme wiring diagram



One drag multiple applications

The KSSHA high-voltage soft start device can start multiple motors at once, that is, it can be used for multiple applications. The performance parameters of the several motors being dragged should be basically consistent. We do not recommend a one to many soft start application solution with significant differences in performance parameters. If necessary, please contact our company in advance.