

Medium and high voltage AC motor solid-state soft starter cabinets



The SHMV-DN series medium and high voltage solid-state soft starter devices are new high-tech electrical equipment designed based on the third-generation digital microprocessor control technology and modern power electronics control technology. They are special equipment dedicated to providing soft starting for medium and high voltage large motors and can offer the best step-down current-limiting soft starting mode for motors. To adapt to different load conditions and achieve better starting effects, the SHMV-DN has been designed with a variety of control functions. As a result, it can smoothly accelerate the starting process with the minimum current required for starting the motor. Therefore, it effectively reduces the voltage drop of the power grid during starting and weakens the current and mechanical impacts during starting. When soft stopping is required, it can provide a smoothly decreasing controllable voltage to the motor, enabling the motor drive system to stop smoothly.

Application scenarios:



As long as the driving torque of the motor is greater than the resistance torque of the load system when the current of the motor is within 5 times of the rated current (FLA), the soft starting mode can be adopted.

Features:

1. A digital microprocessor is used to manage data and communication. Signal grading processing and isolation technology are adopted, enabling the system to have strong anti - interference ability. Moreover, the equipment control is real - time and efficient, with good stability and high reliability.
2. Advanced optical fiber transmission control technology is used to trigger high - voltage thyristors.
3. Safe isolation between the detection and high - low voltage control circuits ensures high safety.
4. High - frequency power supply isolation and transformation technology are used to provide a safe and reliable working power supply for electronic devices operating in the high - voltage part.
5. The static and dynamic voltage equalization and absorption technology of the resistance - capacitance network ensures the reliable and safe operation of power devices in series under high voltage.
6. The electronic EVT (Electronic Voltage Transformer) technology is adopted. Electronic sampling and optical fiber transmission are free from interference and phase shift.
7. Starting curves are designed to adapt to the mechanical characteristics and requirements of different motor systems. The motor torque is automatically adjusted to obtain a smooth acceleration curve and reduce electrical and mechanical shocks during the starting process.
8. Stopping curves are provided to adapt to the mechanical characteristics of different loads. There is a function of adjustable final torque, which effectively prevents the water hammer effect caused by the shutdown of pump - type loads.
9. The pulse jump function improves the initial starting torque and is suitable for high - static - resistance torque systems.
10. Protection functions: There are over - voltage, under - voltage, multiple overload protection curves, as well as under - current, phase loss, phase imbalance, wrong phase sequence, zero - sequence grounding protection, thyristor over - temperature, excessive starting time, starting interval limitation, thyristor failure protection, etc.
11. The V - DN series high - voltage solid - state soft starters can use a low - voltage (380V) motor for simulation debugging before on - site high - voltage operation, providing technical data and guarantees for formal operation.
12. The cabinet adopts the KYN28A - 12 structure type. The materials are imported aluminum - zinc - coated steel plates, which have the advantages of corrosion resistance, oxidation resistance, novel and beautiful appearance, and high protection level. It can also be conveniently combined with the KYN28A - 12 standard middle - installed cabinet.
13. The speed feedback control function: For occasions requiring linear acceleration and deceleration, a speed feedback unit can be optionally connected to obtain the linear acceleration and deceleration characteristics of the motor. (Optional)
14. For the occasion of generator - powered motors, a special control program is set to ensure successful starting under unstable voltage, current, and frequency conditions. With appropriate reactive power compensation, a lightly - loaded motor can be successfully started when the generator capacity is more than 1.35 times the apparent power of the motor.
15. Parameter adjustment function: For two - speed motors, or in the case of power supply from the power grid/generator, or when the parameters of two motors are different in a one - drag - two situation,
16. Two sets of starting and stopping parameters can be input. The required set of parameters can be conveniently selected through programmable terminals for starting and operation.
17. It has a friendly human - machine operation interface and historical data statistical query function. If necessary, a touch - screen interface can be optionally selected to better realize human - machine information exchange.
18. It has an RS485 interface, and communication protocols (Modbus/Profibus) are optional, which is convenient for users to achieve centralized monitoring.
19. Insulation detection function. (Optional)

Performance parameters:

- 1. Control mode: Pulse jump starting, voltage ramp, constant current, speed control (optional)
- 2. Starting method: Soft start, direct start, soft stop, free stop.
- 3. Operation mode: Control on the cabinet, external control, communication remote control (optional)
- 4. Communication method: RS485 interface; Modbus protocol and Profibus protocol (optional)
- 5. Analog output: Motor operating current, with the signal being 0-10V or 4-20mA or 0-20mA.
- 6. Initial voltage: 10% ~ 50% Un (can be extended to 5%~80%Un)
- 7. Current limiting multiple: 100%~400%In (can be extended to 500%In)
- 8. Starting and stopping time: 1 ~ 30S (can be extended to 90S)
- 9. Starting pulse jump: Current, 70%-700%In (when the pulse jump time is 0~10 seconds)
- 10. Parameter setting: 1-- Control panel buttons; 2-- Background communication setting.
- 11. Liquid crystal display: Parameters such as working current, number of starts, running time, and fault information, etc. Default languages: Chinese (English), German, French, Spanish.
- 12. Noise level: < 80dB
- 13. Continuous starting interval: When the ambient temperature is higher than 40°C and the starting current is greater than 400%In, the interval should not be less than 30 minutes. When the temperature is relatively low and the starting current is relatively small, the interval can be appropriately reduced, but it should be at least 15 minutes.
- 14. Cooling method: Natural cooling.
- 15. Operation power supply: AC220V/50Hz 600VA (Special requirements need to be specified separately)
- 16. Power frequency withstand voltage of the main circuit: 42KV/1 minute (excluding the power unit)
- 17. Protection mode: Composite (See the introduction of protection functions)
- 18. Protection level: IP42 (IP54 can be selected for special requirements)

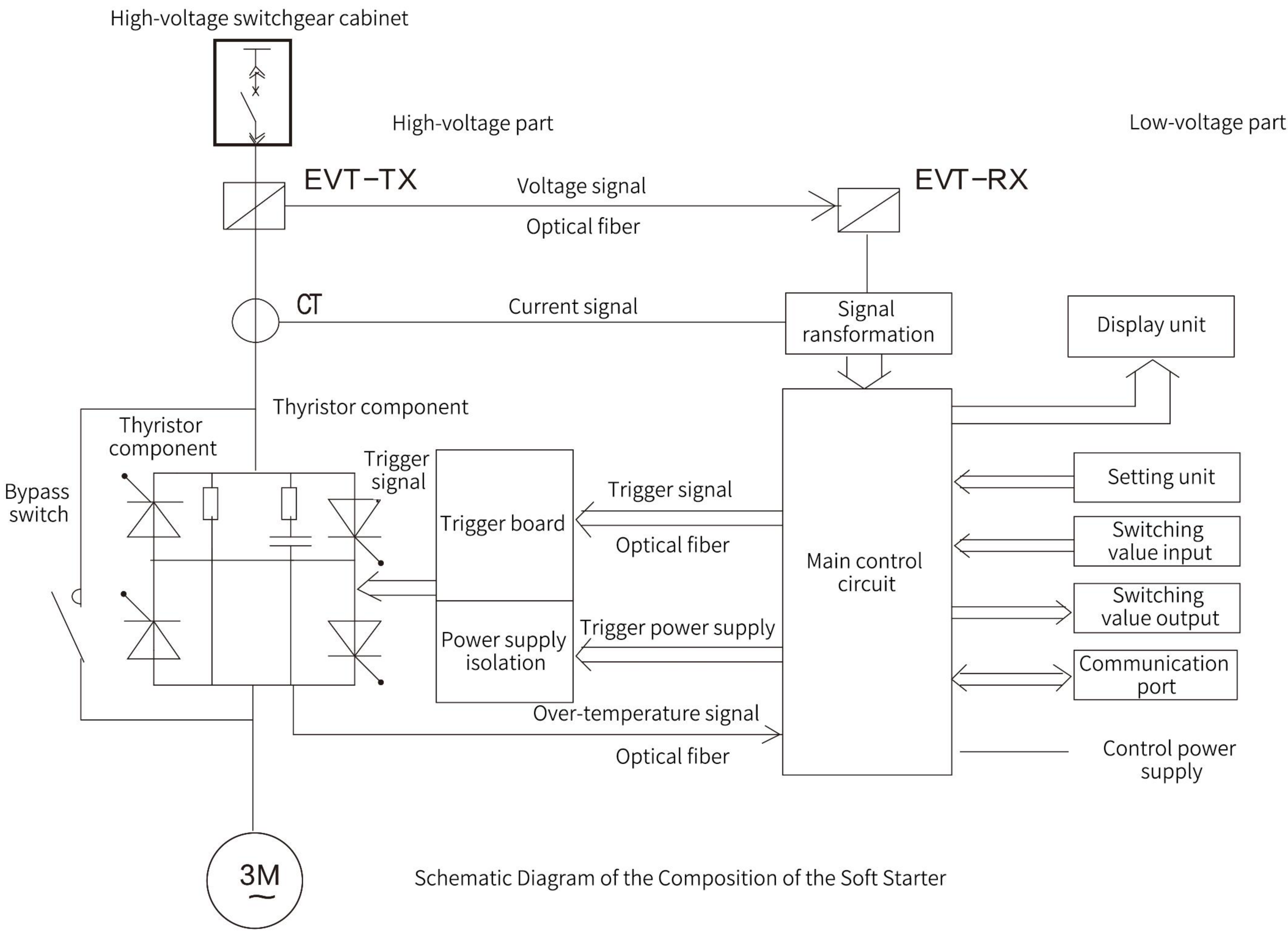
Working environment:

- Operating temperature of the ambient air around the equipment: -10°C to 50°C.
- Storage temperature: -20°C to 70°C (Special conditions should be declared when placing an order).
- The relative humidity of the ambient air around the equipment should not exceed 95% at +50°C. A higher relative humidity is allowed at lower temperatures.
- There should be no explosion - hazard and corrosive gases in the surrounding environment of the equipment. Pollution degree: ≤3 (can be increased to 4).
- Vibration: The allowable vibration conditions at the installation site are as follows: the vibration frequency ranges from 10 Hz to 150 Hz, and the vibration acceleration is not more than 0.5 m/s².
- Main circuit power supply: Three - phase, 10 kV/50 Hz. The continuous voltage fluctuation should not exceed - 15% to +10%.
- The frequency fluctuation should not exceed ±5 Hz, and the frequency change rate should not exceed ±1% per second.
- Altitude: ≤1000 m (can be extended to 4000 m).

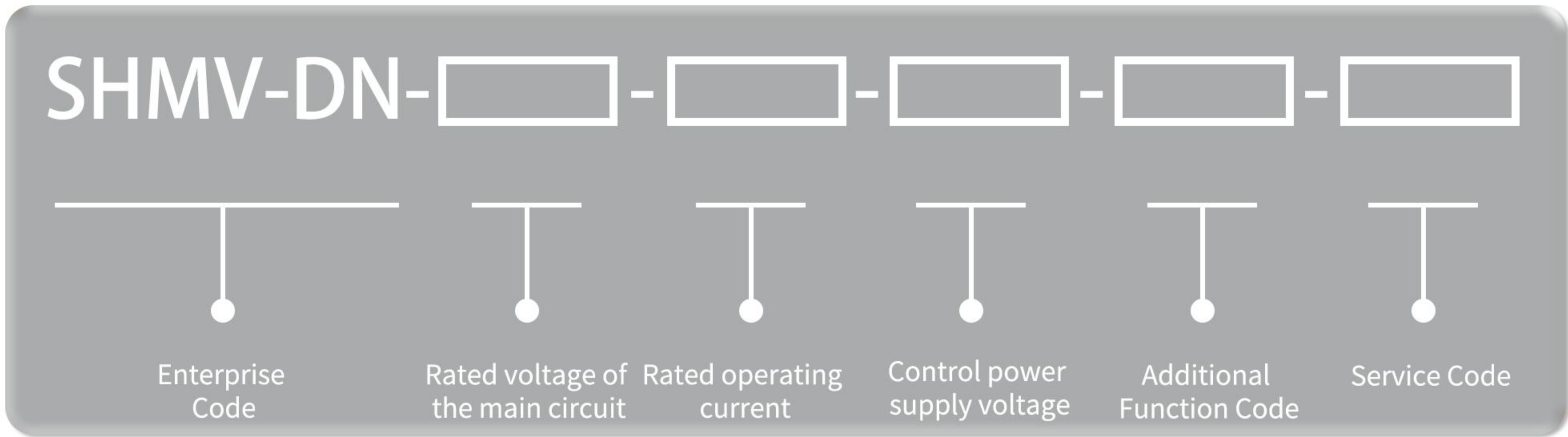
Remarks: The parts in black font in the performance, parameters, working environment and conditions are standard configurations. If the user has other requirements for the text within the brackets, they should be clearly specified in the contract or technical agreement when placing an order!

Components of the soft starter:

- High-voltage part: The high-voltage devices in the high-voltage compartment mainly include high-voltage thyristor components, EVT-TX (voltage signal transmitter), current transformers, trigger boards, bypass switches, etc.
- Low-voltage part: The low-voltage devices in the low-voltage compartment mainly include the main control circuit, EVT-RX (voltage signal receiver), signal converters, setting units, input and output units, power supplies, etc.



Model selection:



● Rated voltage of the main circuit Nominal value Permissible range

2.3KV	+10%-15%
3.3KV	+10%-15%
4.16KV	+10%-15%
6.0KV	+10%-15%
6.6KV	+10%-15%
10KV	+10%-15%
13.8KV	+10%-15%

● Control power supply voltage Nominal value Scope of application

Default value: 220VAC	220VAC	200-240VAC
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● Additional Function Code Code Function Introduction

MODBUS	Communication function
Profibus	Communication function
A.OUT	Analog quantity output

Note:

When multiple additional functions are selected, different function codes can be placed in sequence.

(Modbus and Profibus cannot be selected simultaneously.) The absence of a function number is regarded as no requirement.

Please clearly indicate the product model when placing an order. For issues where the code representation is unclear, additional written explanations can be provided.

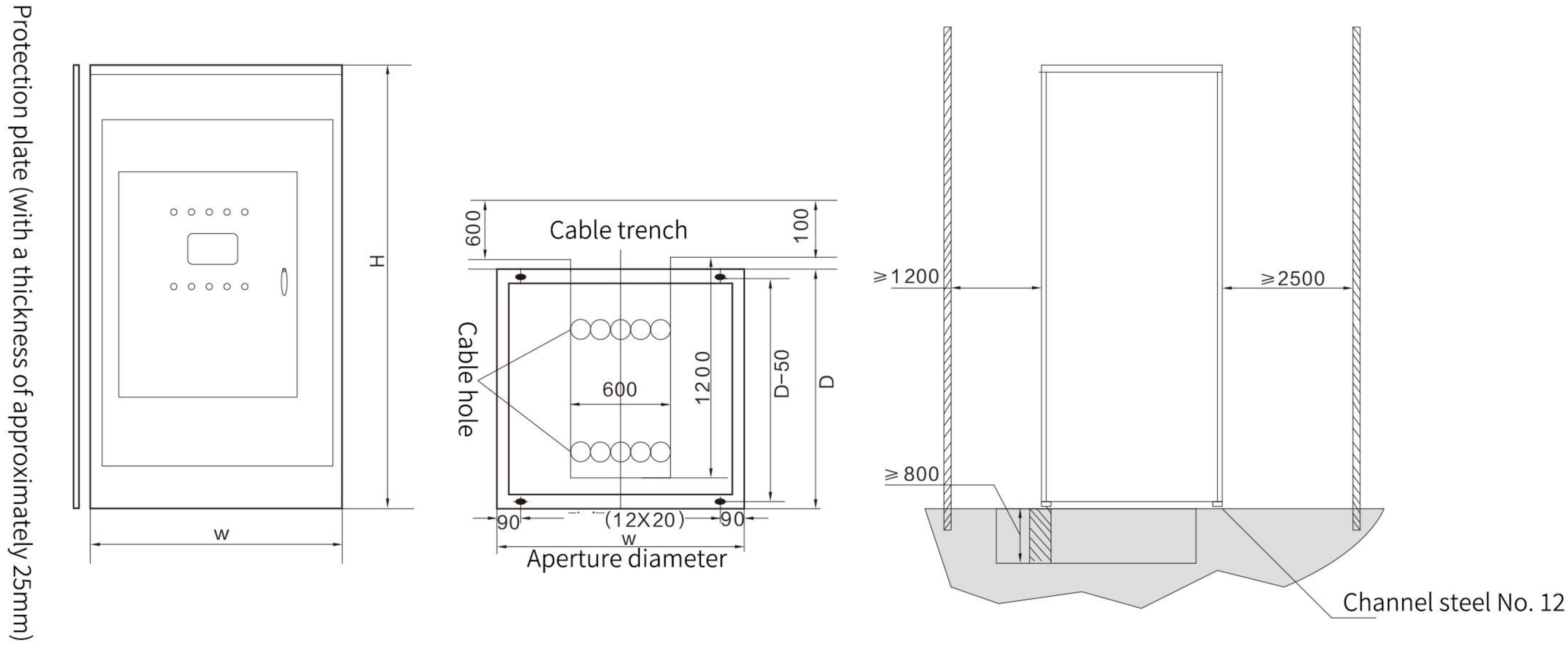
Model selection:

The products with a voltage level of 3.3KV can be used to replace those with a voltage level of 2.3KV; the products with a voltage level of 6.0KV can be used to replace those with a voltage level of 4.16KV and 6.6KV.

The soft starter must be selected according to the rated current indicated on the motor nameplate (even if the motor is not operating at full load). The corresponding KW values given in the table are for reference only. However, it should be noted that when the motor powers at different voltage levels are the same, the currents are different. When selecting the model, please calculate the current according to the power and then confirm.

Model	Voltage (KV)	Current (A)	Power (kW)	Size W*D*H (mm)
SHMV-DN-03-60	3	60	265	1000*1300 (1500) *2300
SHMV-DN-03-100	3	100	442	1000*1300 (1500) *2300
SHMV-DN-03-200	3	200	883	1000*1300 (1500) *2300
SHMV-DN-03-300	3	300	1325	1000*1300 (1500) *2300
SHMV-DN-03-400	3	400	1767	1000*1300 (1500) *2300
SHMV-DN-03-600	3	600	2650	2500*1660*2400 (Subject to actual situation)
SHMV-DN-03-800	3	800	3533	2500*1660*2400 (Subject to actual situation)
SHMV-DN-03-1000	3	1000	4417	3250*1660*2400 (Subject to actual situation)
SHMV-DN-03-1200	3	1200	5300	3250*1660*2400 (Subject to actual situation)
SHMV-DN-03-1400	3	1400	6183	3250*1660*2400 (Subject to actual situation)
SHMV-DN-06-60	6	60	530	1000*1300 (1500) *2300
SHMV-DN-06-100	6	100	883	1000*1300 (1500) *2300
SHMV-DN-06-200	6	200	1767	1000*1300 (1500) *2300
SHMV-DN-06-300	6	300	2650	1000*1300 (1500) *2300
SHMV-DN-06-400	6	400	3533	1200*1300 (1500) *2300
SHMV-DN-06-600	6	600	5300	2500*1660*2400 (Subject to actual situation)
SHMV-DN-06-800	6	800	7067	2500*1660*2400 (Subject to actual situation)
SHMV-DN-06-1000	6	1000	8833	3250*1660*2400 (Subject to actual situation)
SHMV-DN-06-1200	6	1200	10600	3250*1660*2400 (Subject to actual situation)
SHMV-DN-06-1400	6	1400	12366	3250*1660*2400 (Subject to actual situation)
SHMV-DN-10-60	10	60	883	1000*1300 (1500) *2300
SHMV-DN-10-100	10	100	1472	1000*1300 (1500) *2300
SHMV-DN-10-200	10	200	2944	1000*1300 (1500) *2300
SHMV-DN-10-300	10	300	4417	1200*1300 (1500) *2300
SHMV-DN-10-400	10	400	5889	1200*1300 (1500) *2300
SHMV-DN-10-600	10	600	8833	2500*1660*2400 (Subject to actual situation)
SHMV-DN-10-800	10	800	11778	2500*1660*2400 (Subject to actual situation)
SHMV-DN-10-1000	10	1000	14722	3250*1660*2400 (Subject to actual situation)
SHMV-DN-10-1200	10	1200	17666	3250*1660*2400 (Subject to actual situation)
SHMV-DN-10-1400	10	1400	20611	3250*1660*2400 (Subject to actual situation)
SHMV-DN-13.8-60	13.8	60	1219	1000*1660*2400 (Subject to actual situation)
SHMV-DN-13.8-100	13.8	100	2032	1000*1660*2400 (Subject to actual situation)
SHMV-DN-13.8-200	13.8	200	4063	1000*1660*2400 (Subject to actual situation)
SHMV-DN-13.8-300	13.8	300	6095	1000*1660*2400 (Subject to actual situation)
SHMV-DN-13.8-400	13.8	400	8127	1000*1660*2400 (Subject to actual situation)
SHMV-DN-13.8-600	13.8	600	12190	2500*1660*2400 (Subject to actual situation)
SHMV-DN-13.8-800	13.8	800	16253	2500*1660*2400 (Subject to actual situation)
SHMV-DN-13.8-1000	13.8	1000	20316	3250*1660*2400 (Subject to actual situation)
SHMV-DN-13.8-1200	13.8	1200	24380	3250*1660*2400 (Subject to actual situation)
SHMV-DN-13.8-1400	13.8	1400	28443	3250*1660*2400 (Subject to actual situation)

Ordering Information:



Instructions Related to the Cabinet:

- The main method of cable inlet and outlet for this product is bottom-in and bottom-out. Therefore, there should be a cable channel of sufficient size under the foundation.
- Protective plates can be added to both sides of the cabinet as required, with each side plate being 25mm thick. (Please specify when placing an order if needed.)
- This product undergoes a powder coating treatment on its surface. The default color is Computer Grey: MB2071 (RAL7032). (Please specify when placing an order if there are special color requirements.)
- By default, the opening direction of the front door of the low-voltage compartment is to the right.
- If there are other special requirements regarding the cabinet's form, dimensions, etc., we can customize, design, and manufacture it according to the user's requests.

Ordering Information and Examples:

- Select the starter according to the rated current of the motor and the working mode, and write down the complete product specification and model as specified by the product model.
- When there are differences from the standard configuration in the sample, please clearly state them separately in the contract (or technical agreement).
- When placing an order, customers are required to provide the specification and model of the equipped motor, the main parameters, as well as the type and characteristics of the driven equipment.