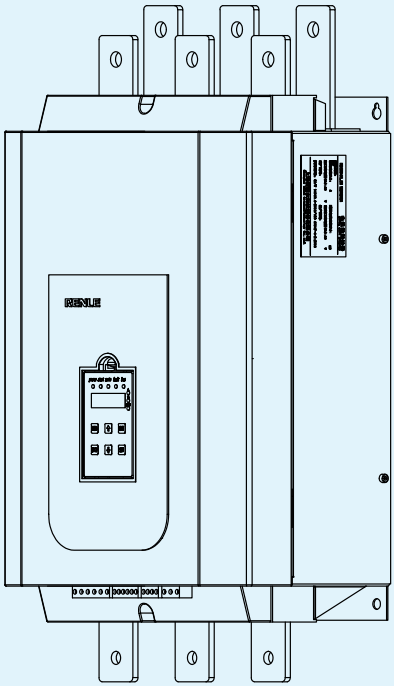
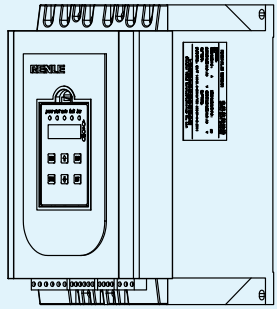
SSD1

Series Motor Soft Starter

2024 | User Manual





RENLE

Preface

Thanks for using Shanghai RENLE SSD1 series low-voltage soft starter!

SSD1 series low-voltage soft starter provides a compact, stable, and reliable soft starting solution for low-voltage motor control. With multiple user interfaces and modular design, it can meet the starting requirements of modern industry for small and medium-sized fan and pump types of general machinery. It is widely used in electric power, metallurgy, mining, building materials, petrochemical and municipal industries.

This manual introduces the functional characteristics and usage of SSD1 series low-voltage soft starter in detail, including product selection, installation, parameter setting, debugging, maintenance, inspection, etc. End users are suggested to read the manual carefully before operation. For further usage reference, the manual should be delivered with the equipment by the supporting manufacturers.

If you encounter any issues this manual does not address while using the product, please contact our distributors or company. Our team of professional technicians is here to assist you and we value your input and suggestions.

Official Website

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SSD1	User Manual	© Shanghai RENLE	English	85

SSD1

Series Motor Soft Starter

Contents

1 Safety Instructions

Contents

This chapter introduces the safety precautions for the installation, commissioning, and operation of SSD1 series soft starter. Failing to obey these precautions may cause personal injury. Please read this chapter carefully before installation.

1.1 Safety Signs

Definition of security icons covered in this manual:

DANGER

- Indicating a hazardous situation that, if not avoided, will result in personal injury, death, or equipment damage.

WARNING

- Indicating a hazardous situation that, if not avoided, may result in personal injury, death, or equipment damage.
- This chapter should be thoroughly read and strictly obeyed for equipment installation, commissioning, maintenance, and repair, otherwise, our company assumes no responsibility for any consequence of personal injury or property damage.

PREVENT ELECTROSTATIC

- Indicating that ESD is required. Otherwise, electronic components may be damaged, leading to device damage.
- Please read the instructions about operation safety in this manual thoroughly for standard operation before using the soft starter. No responsibility is assumed by our company for any consequence of abnormal operation, device damage, or even personal injury or death arising from the wrong operation.

1.2 Security Precautions

1.2.1 Before installation:

Danger

- Water traces found in the machine when unpacking indicate that the soft starter has been flooded. Please do not install and use it.
- If the machine is damaged, deformed, or missing parts when unpacking, please do not install and use it to avoid the danger of fault expansion and personnel injury.
- Do not touch the control terminals, PCB board, and other components inside the soft starter directly with your hands.

Warning

- Please do not install and use the machine if the actual product is inconsistent with the product packing list.
- Please do not install and use the machine if the specification on the product nameplate is different from your order.

1.2.2 During installation:

Danger

- The equipment should be installed by qualified personnel, otherwise there is a risk of electric shock.
- The equipment should be installed on metal or other flame-retardant objects, and away from combustible materials, otherwise it may cause fire.
- The fixing screws should be assembled according to regulations and tightened to prevent the machine from falling and damaging.
- The equipment should not be installed in an environment containing flammable and explosive gas, in case of risk of explosion.

⚠ Warning

- Handle the equipment gently to prevent it from falling, breaking, or causing injury to your foot.
- Install the soft starter in a place with small vibration and no water droplets, avoiding direct sunlight.
- Arrange the installation position carefully especially for the installation of two or more soft starters in one cabinet to ensure good ventilation and heat dissipation, otherwise, it may cause product failure or damage.
- Avoid dropping wire ends, screws, or drilling residue inside the soft starter in case of product damage.

1.2.3 During wiring:

⚠ Danger

- Wiring operations must be carried out by qualified personnel, otherwise there is a risk of electric shock or product damage.
- This manual must be strictly obeyed when wiring, otherwise there is a risk of electric shock or product damage.
- The input power supply should be completely disconnected before performing power distribution work, otherwise, there is the risk of electric shock.
- The cables, circuit breakers, contactors, etc. should be selected corresponding to the soft starter's specifications.
- The soft starter must be reliably grounded, otherwise there is a risk of electric shock.
- The wiring should strictly follow the silkscreen on the soft starter. Reverse the input and output line is unacceptable, otherwise there is a risk of product damage.

⚠ Warning

- Keep the signal cable away from the power cable. It should be vertically cross-distributed when the distance is not guaranteed, otherwise it will cause signal interference.
- Ensure that all terminal screws are tightened when wiring, otherwise, the product may be damaged.

1.2.4 During power-on operation:

⚠ Danger

- The soft starter can only be energized when the wiring is complete and the cover plate is closed.
- The cover plate is forbidden to be opened when the soft starter is energized, otherwise there is a risk of electric shock.
- The soft starter should be in the operating range, otherwise there is a risk of equipment damage.
- Non-professional technicians are forbidden to test the signal in the running state, otherwise there is a risk of personal injury or product damage.
- The parameters of the soft starter can not be arbitrarily changed, otherwise there is a risk of product damage.

⚠ Warning

- Starting by energizing the soft starter or stopping by de-energizing is not supported, otherwise there is a risk of product damage.

1.2.5 Others:

⚠ Warning

- Do not use this soft starter beyond the scope specified in this manual. Please contact our company if you have special needs.
- Do not conduct a high-voltage insulation test on this soft starter, otherwise, it will cause product damage.
- Machine scrap should be disposed of as industrial waste. Incineration is strictly prohibited, otherwise, there may be the risk of explosion.
- High altitude affects the soft starter's service life. The thin air reduces its heat dissipation effect and makes the electrolyte in its electrolyte capacitor easier to volatilize.

Prevent Electrostatic

Printed circuit boards and power units contain some components that are sensitive to static electricity, and it is necessary to eliminate static electricity before touching or repairing these components. This should be done by a professional technician. The rules for static electricity elimination are:

- Operators should wear antistatic wristbands.
- Sensitive components must be stored in antistatic bags when transported.
- When holding printed circuit boards, they should be held by the edge.
- It is strictly prohibited to slide printed circuit boards on any surface.
- When returning components to the manufacturer for repair, they must be packaged safely using antistatic equipment.

1.3 Others

1.3.1 Open-package inspection

- Prevent scratches or collisions while unpacking.
- Check the items against the packing list while unpacking.
- Check the condition of the equipment's outlook and the attached items and materials, such as user manuals, certificates, etc.

1.3.2 Ordering instructions

- Describe the power supply mode, operating environment, and usage of the device.
- Describe the model, specification, quantity, delivery date, system parameters and requirements of the device.
- Please consult with our company's technical personnel for special operating environment and technical requirements.

1.3.3 Scrap disposition

- Containing harmful substances, the device is strictly prohibited to discard at will, so as not to cause environmental pollution.

2 Product Information

Contents

This chapter introduces the selection, technical parameters, and hardware dimensions of SSD1 series soft starter.

2.1 SSD1 Product Features

The SSD1 series soft starter is of wall-mounted structure. The enclosure of M1 is made of pure plastic construction, as are the other models' front panels. The metal surface employs a powder coating process, featuring exquisite finish and elegant appearance. This series of soft starter adopts a natural air cooling mode, eliminating the need for mechanical exhaust in switch cabinets and imposing no unique requirements for electrical layout.

2.2 Application Fields

The SSD1 series low-voltage soft starter is widely used in various industries, including thermal power generation, hydropower, power transmission and distribution equipment, metallurgy, petroleum, chemical, construction, and municipal engineering.

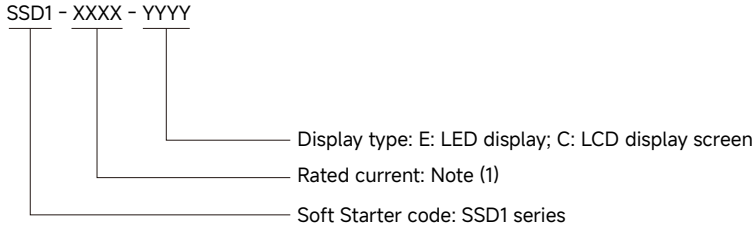
Common application fields:

Industry	Application Examples
Electric power	Primary air fan, Secondary air fan, Boiler induced draft fan, Boiler feedwater pump, Condensate pump, Circulating water pump, Power exhaust fan, Mortar pump, etc.
Cement	Kiln-induced draft fan, Kiln supply fan, Kiln tail fan, Kiln heat fan, High-temperature fan, Dust removal fan, Raw material mill fan, Circulation fan, Cement mill fan, pressure blower, Separator fan, Main dust-collect fan, Cooler fan, etc.
Municipal	Water supply pump, Water intake pump, Sewage pump, Purification pump, Fresh water pump, Heat supply network pump, Forced draft fan, Induced draft fan, Aeration fan, Pressure pump, Hot water circulation pump, Lift pump, etc.

2.3 Naming Rules and Nameplate

2.3.1 Model naming rules

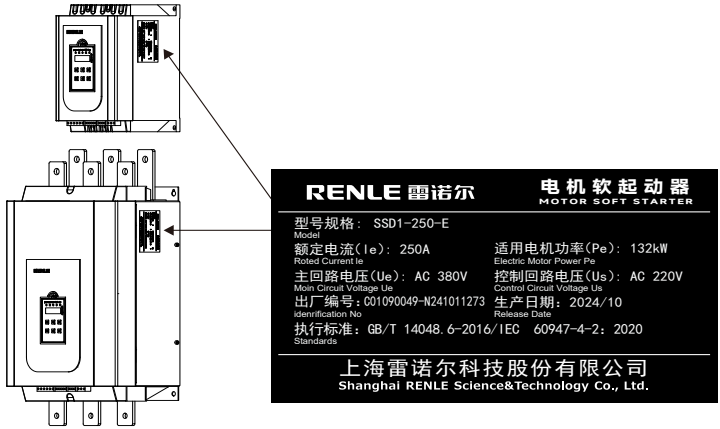
Product model composition:



Note(1): This range covers 16 rated current values from 40A to 1200A, available in 4 physical configurations (M1 ~ M4).

2.3.2 Product nameplate

Nameplate information and location:



2.4 Specification and Parameters

The following tables describe the specifications of different SSD1 series low-voltage soft starter models and their technical parameters.

2.4.1 Product specifications

SSD1 series soft starter 380V（-15%~+10%）50/60Hz（±2%）

Physical Configuration	Model	Rated current Ie (A)	Matching motor rated power（kW)	Rated current setting range (A)
M1	SSD1-40-E/C	40	22	10~70
	SSD1-54-E/C	54	30	
	SSD1-68-E/C	68	37	
	SSD1-80-E/C	80	45	30~120
	SSD1-100-E/C	100	55	
M2	SSD1-135-E/C	135	75	60~340
	SSD1-160-E/C	160	90	
	SSD1-200-E/C	200	115	
	SSD1-250-E/C	250	132	
	SSD1-300-E/C	300	160	
M3	SSD1-360-E/C	360	200	120~650
	SSD1-500-E/C	500	250	
	SSD1-600-E/C	600	320	
M4	SSD1-800-E/C	800	400	350~1200
	SSD1-1000-E/C	1000	500	
	SSD1-1200-E/C	1200	600	

Note: Product structure and dimension refer to 2.6.2 Product outline, dimension, and weight.

2.4.2 Technical parameters

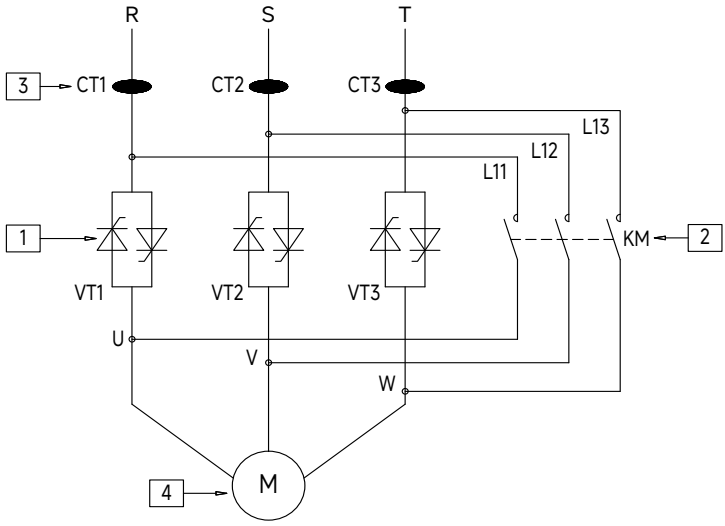
Function	Function Specification
Start	Constant current
	Voltage ramp
Stop	Coast to stop
	Soft stop

Protection	Grounding protection
	Overvoltage protection
	Undervoltage protection
	Overcurrent protection
	Overload protection
	Stall protection
	Three-phase current unbalance
	Output phase loss
	Thermal protection
	Motor unconnected prompt
I/O	Programmable digital input (5)
	Programmable relay output (3) 6A 250VAC/30VDC (normally open only)
	Programmable analog output (1) 0/4-20mA (current mode)
Communication module	Modbus RTU

2.5 Working Principle and Composition

2.5.1 System working principle

Working principle diagram



2.5.2 System composition

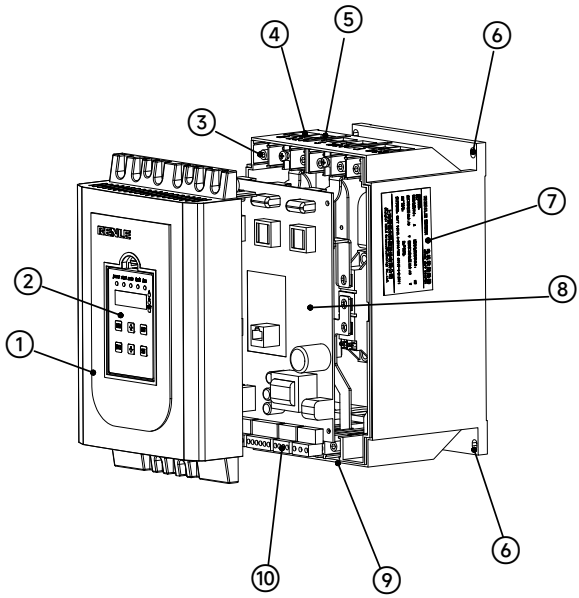
No.	Function Specification
1	Thyristor module. Composed of VT1, VT2, VT3 forward and reverse thyristors.
2	External bypass contactor, used to switch the main circuit to the power frequency after successful soft start-up.
3	Current transformer, used to detect current in the main circuit.
4	Three-phase AC motor

Note: If the reactive power compensation device needs to be connected, it can only be connected to the power supply end of the soft starting device, and the connection at the output end is not allowed.

2.6 Hardware Information

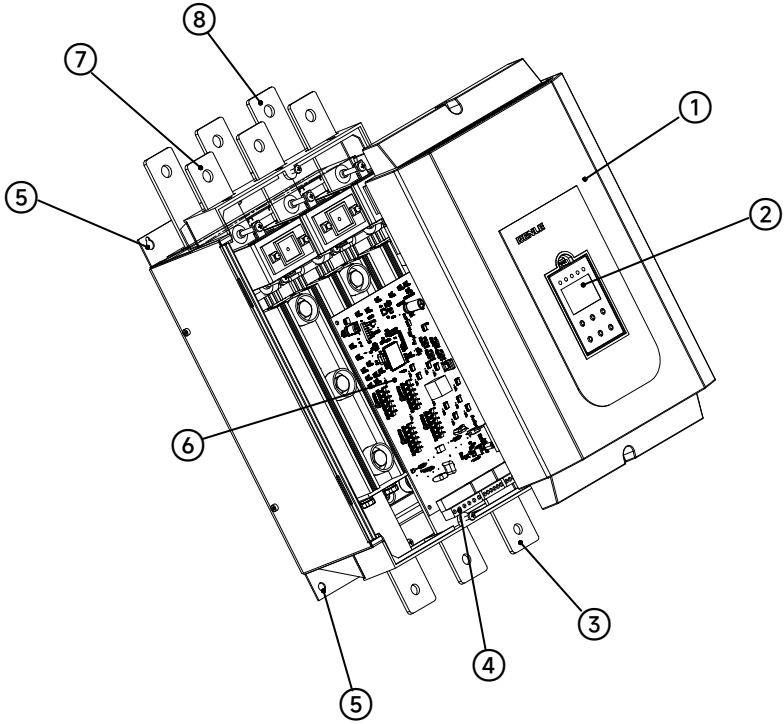
2.6.1 Product structure

Product structure



M1 product structure

No.	Name
1	Cover
2	Operation panel
3	Terminal
4	Main circuit power supply copper bar (R, S, T)
5	Bypass copper bar (L11, L12, L13)
6	Back mounting hole
7	Nameplate fixed set
8	Main control panel
9	Motor wiring copper busbar (U, V, W)
10	External control wiring terminal

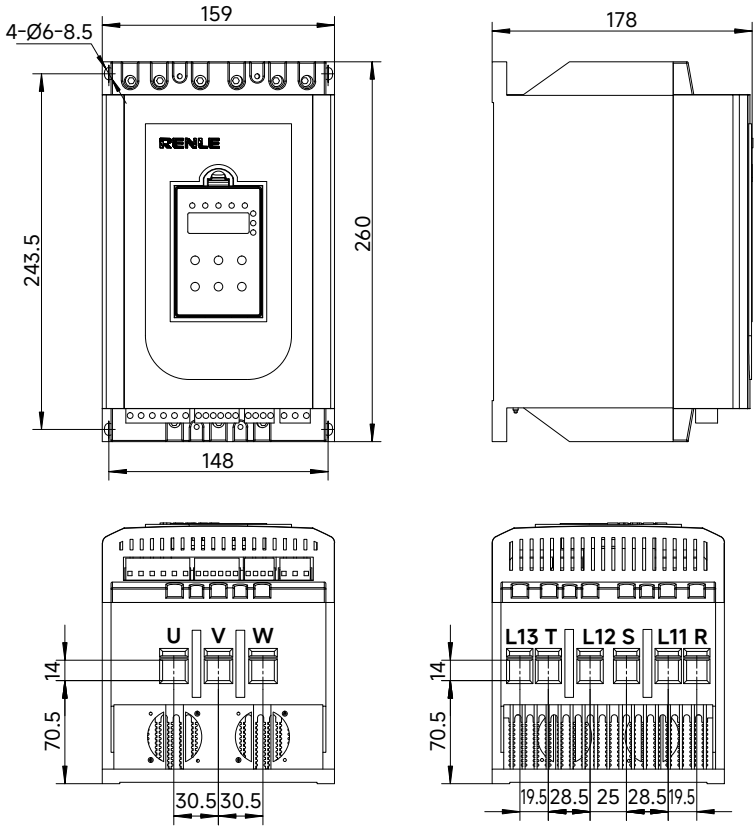


M2~M4 Product structure

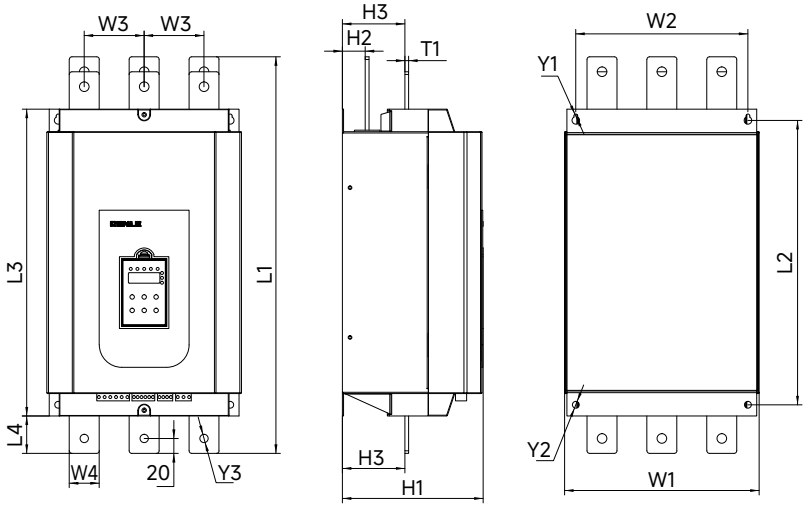
No.	Name
1	Cover
2	Operation panel
3	Motor wiring copper busbar (U, V, W)
4	External control terminal
5	Back mounting hole
6	Main control panel
7	Main circuit power supply copper bar (R, S, T)
8	Bypass copper bar (L11, L12, L13)

2.6.2 Product outline, dimension, and weight

1. M1 Production outline and dimension:



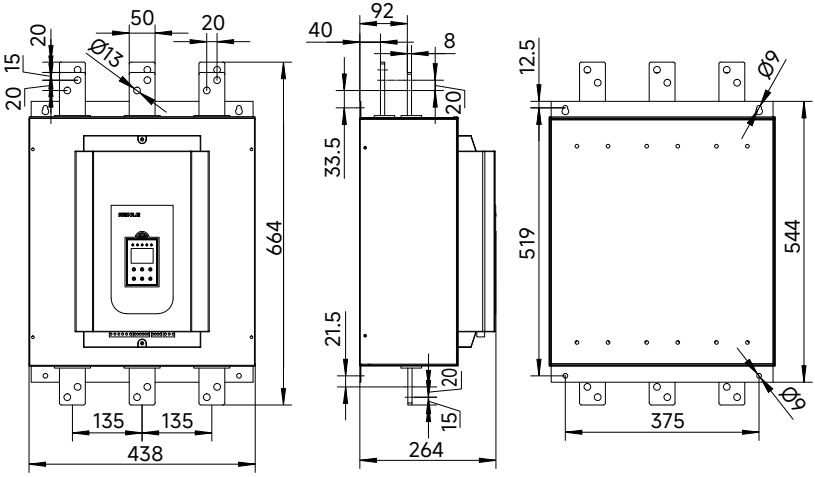
2. M2-M3 Production outline and dimension:



Outline and dimension table:

Size (mm) / Model	L1	L2	L3	L4	W1	W2	W3	W4	H1	H2	H3	T1	Y1	Y2	Y3
M2	530	380	410	50	260	230	80	40	188	30	84	5	Ø9	Ø9	Ø13
M3	565	410	440	50	290	260	90	40	190	30	84	6	Ø9	Ø9	Ø13

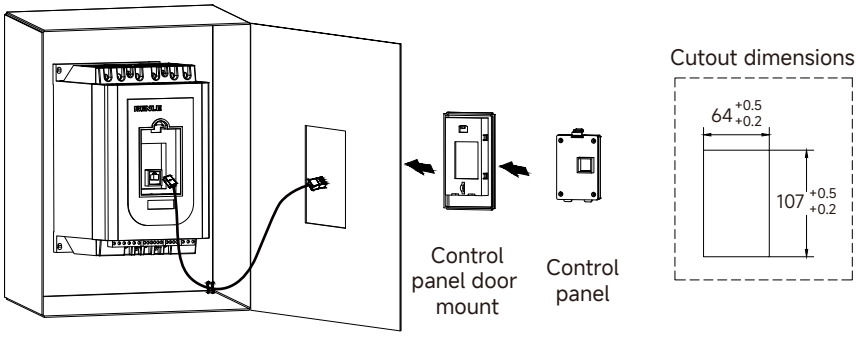
3. M4 Production outline and dimension:



4. Product weight:

Model	M1	M2	M3	M4
Gross weight (kg)	5	22.5	27.5	52

2.6.3 External access and opening size of the operation panel



Note: The mentioned control panel door mount and communication extension cable are optional accessories.

3 Installation

Contents

This chapter introduces the Installation precautions, terminal wiring diagram and control circuit principle of SSD1 series soft starter.

3.1 Installation Requirements

3.1.1 Environment requirements

1. Refer to the following table for the environment of device operation.

Items	Requirements
Ambient Temperature	In the range of -30 ° C to 70 ° C; preheating for temperature below -30 °C ; derated operation for temperature above 70 °C ; The average temperature for 24 hours should be in the range of 5 °C ~50 °C .
Relative Humidity	Less than 50% at the highest operation temperature (70 °C); less than 85% at the lowest operation temperature (-30°C); Condensation should not occur due to temperature changes.
Altitude	Below 1000m; derated operation for altitude above 1000m (the reduction in rating should be 0.5% for every 100m over 1000m)
Air Pressure	In the range of 86 kPa~106 kPa.
Air Quality	The dust content in the electrical room should be roughly equal to the atmospheric dust, in which conductive dust such as iron powder and organosilicon particles should especially not be contained.

Notes:

a) The above are standard specifications. Please refer to the technical agreement for details.

b) The soft starter does not apply to environments with corrosive gases. Please refer to the technologists for specific standards in advance.

2. Refer to the following table for the device storage environment.

Items	Specifications	
Storage Temperature	-10 °C ~45 °C , air temperature change should be less than 1 °C /min.	Avoid places where rapid temperature changes could cause condensation and freezing.
Relative Humidity	5%~95%	
Storage Temperature	Free from direct sunlight, dust, corrosive gas, flammable gas, oil mist, steam, dripping, etc.	

General requirements:

a) Place the device on a suitable support. Placing directly on the ground is not suggested.

b) Add an appropriate amount of desiccant in a moist environment.

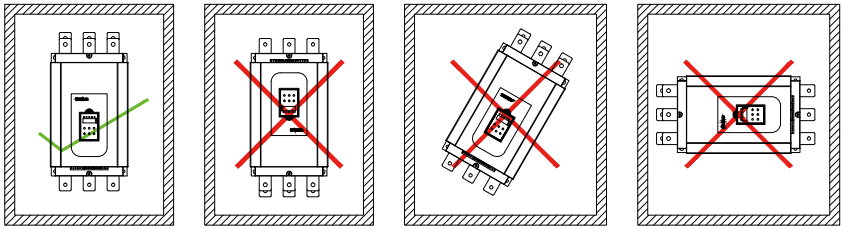
c) Prevent moisture immersion with protective packaging made of polyethylene material or aluminum metal film.

d) Inspect regularly: Check every month of the whole storage period for the storage and packaging status of the device. Pay special attention to mechanical damage and damage caused by humidity, temperature, or fire. For damage to the package or the device, check and repair it immediately and store it according to the preceding requirements.

3.2 Installation Description

Definition of the security ICONS involved in this manual:

1. Install the soft starter vertically as shown below, ensuring the operation panel can be seen in the front. Upside-down or horizontal installation is prohibited. The soft starter should be mounted on a strong structure using screws.

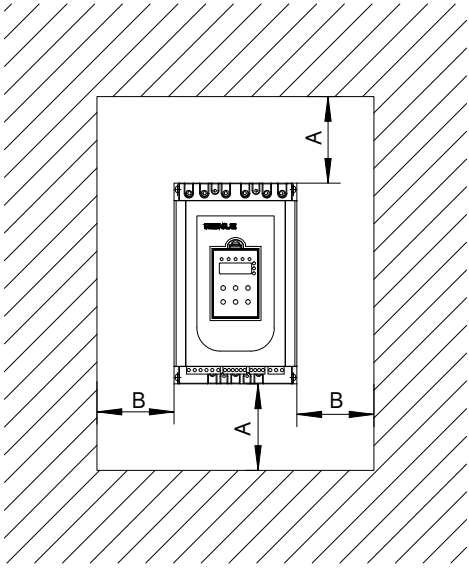


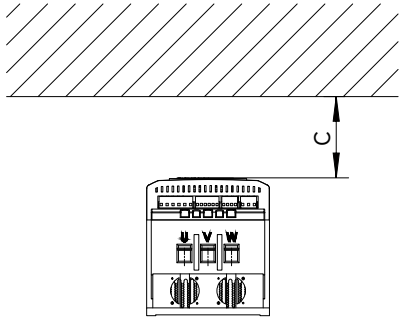
2. Leave a certain space around the soft starter for cooling air passage while installing. The soft starter generates heat when running so the minimum distance is required for cooling as shown below. Since generated heat dissipates upward, installation under heat-intolerant devices should be avoided.

3. Install heat insulation deflectors or take other measures to avoid overheating of the upper-layer one caused by the heat dissipation of the lower-layer one if one soft starter has to be installed on the other. When the soft starter is running, the temperature of the heat sink may be close to 90 ° C. Therefore, the mounting surface opposite the back of the soft starter should be made of high-temperature-resistant materials.

4. Keep the distance between the soft starter and the cabinet no less than the minimum installation distance required if the soft starter is to be installed in a control cabinet. To ensure ventilation and heat dissipation, the soft starter should not be installed in a narrow, poorly ventilated and heat-dissipated closed cabinet.

Installation requirements



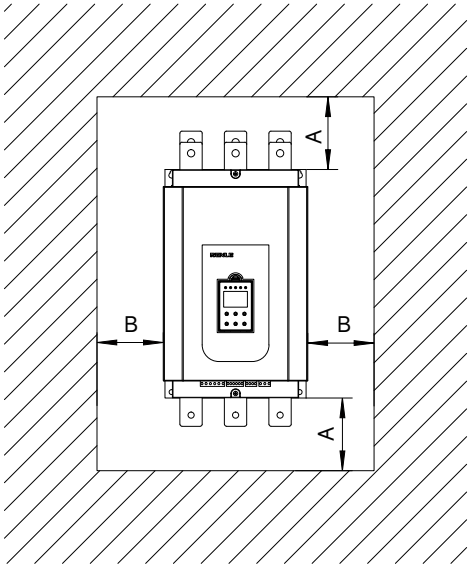


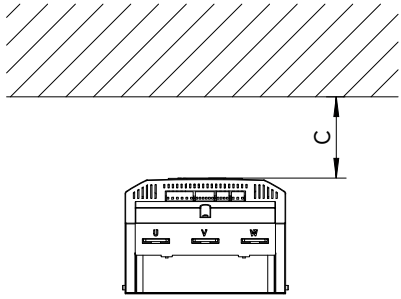
A>100 mm

B>20 mm

C>20 mm

M1 Physical Configuration





A>100 mm

B>20 mm

C>20 mm

M2-M4 Physical Configuration

5. Comply with the soft starter installation regulations. Failure to do so may affect the service life of the soft starter, cause the soft starter function failure, or even cause the soft starter functional fault.

Danger

- Install the soft starter on non-burning structures such as metal to prevent fire accidents.

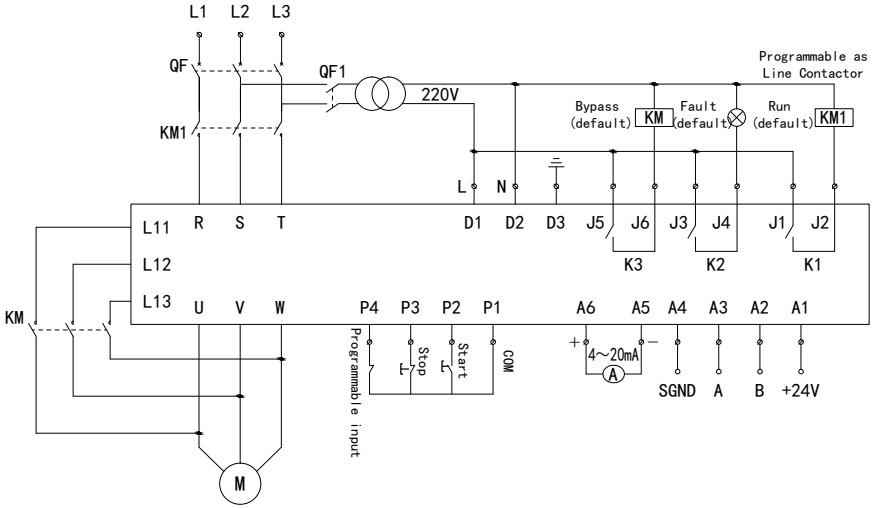
Warning

- Keep fibers, paper, wood chips, dust, metal fragments, and other objects from going inside the soft starter or sticking to the heat sink to prevent fire accidents or device damage.

3.3 Main Circuit Terminal Wiring

3.3.1 Main circuit terminal wiring

1. Diagram of wiring applied externally:



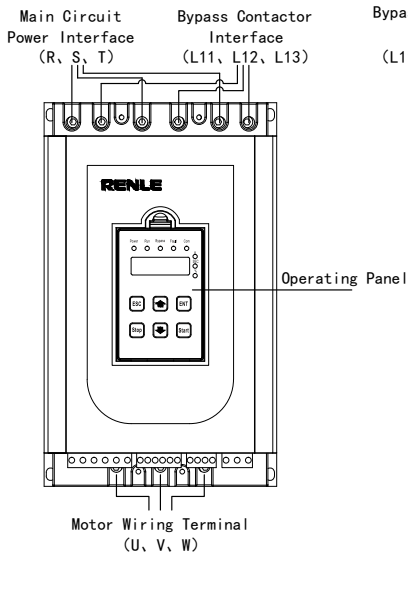
2. The wiring of the main circuit terminal is described in the table below:

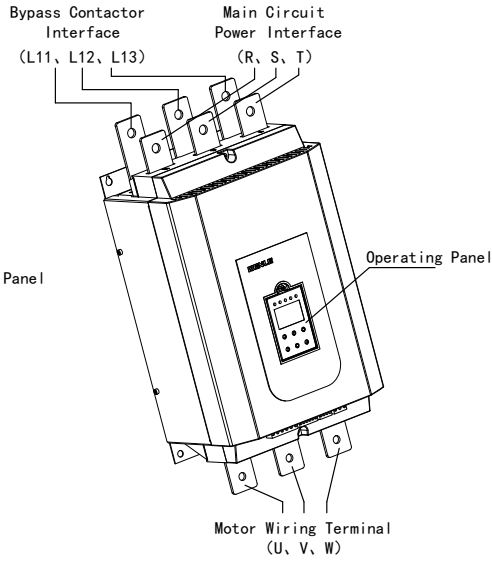
Silk Screen	Terminal Type	Function Description
PE	Grounding terminal of soft starter	The ground terminal of the soft starter shell should be connected to the ground
R, S, T	Input terminal of soft starter	Connect to three-phase power supply
L11, L12, L13	Input terminal of bypass contactor	The incoming line of bypass contactor
U, V, W	Output terminal of soft starter	Connect to three-phase asynchronous motor

Before the SSD1 series soft starters' first connection to the main power supply, turn on the control power supply voltage, ensuring the bypass contactor is disconnected to prevent accidental starting.

Note: The use of a vacuum circuit breaker or vacuum contactor for switching or as a bypass contactor requires the installation of an overvoltage protection device.

3. The LCD panel and main circuit wiring are shown below:





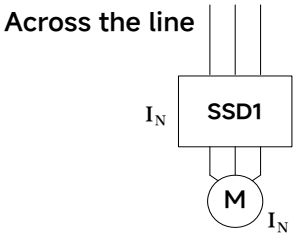
M1 main circuit terminal connection layout

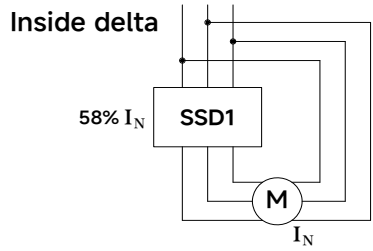
M2~M4 main circuit terminal connection layout

3.3.2 Three-phase output terminals: U, V, W

The three-phase terminals of the soft starter should be connected to the three-phase asynchronous motor in the correct phase sequence. Adjust any two of the three phases of U, V and W if the motor is missteering.

Main Circuit Wiring



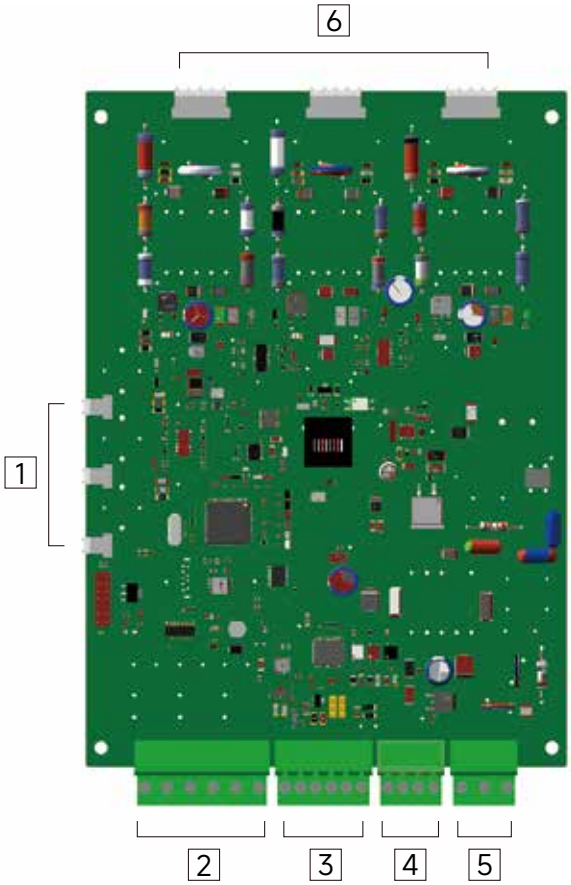


The soft starter's main power circuit can be wired in either Inside Delta or Across-the-Line configuration:

1. Phase sequence shall be observed (incorrect wiring may cause equipment damage).
2. Fuses shall be installed inside the delta.
3. Parameter n3.02 shall be set to 58% of the motor's rated current.

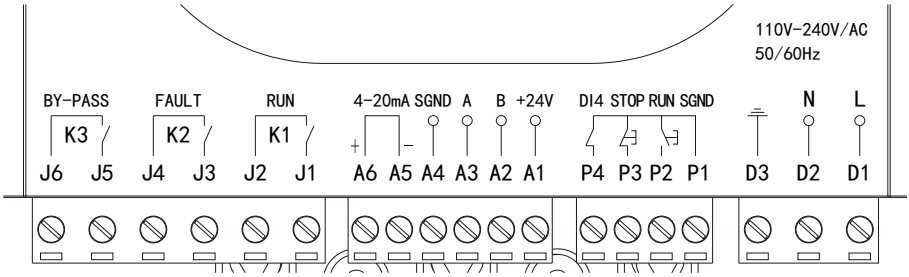
3.4 Control Terminal Wiring

3.4.1 Physical PCB layout:



No.	Function Description
1	Current transformer terminal.
2	Relay output terminal.
3	Analog output and isolated RS485 communication output terminal.
4	Control terminal.
5	Control power input terminal and PE grounding terminal; 220VAC, 50/60Hz.
6	Thyristor drive terminal.

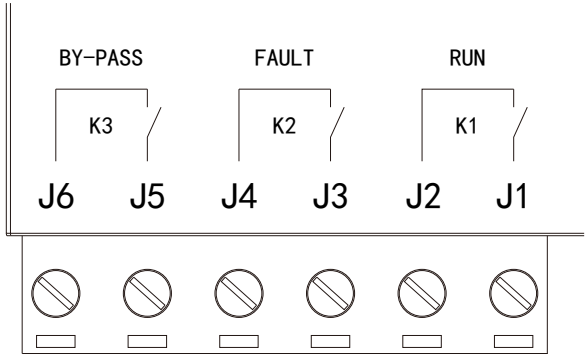
3.4.2 External terminal diagram:



Control terminal diagram

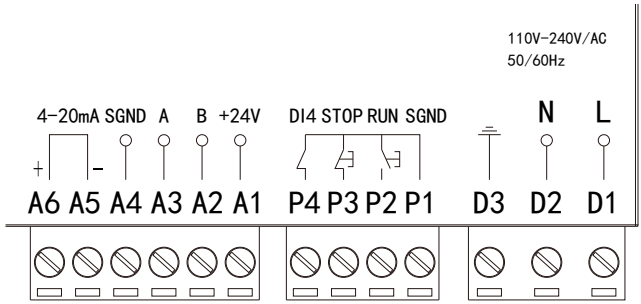
3.4.3 External terminal wiring diagram:

1. Relay terminal wiring diagram



Relay terminal wiring diagram

2. Analog output, programmable input, and control power terminal wiring diagram



External control terminal diagram

Each control terminal is connected to different function settings. Please refer to the function description of each terminal to set the relevant function.

Terminal No.	Name	Description
J1	Programmable relay output K1	Relay output information is selected from n7.17 RO3 function definition, including ready, running, bypass, fault, etc. The default value is in running mode.
J2		
J3	Programmable relay output K2	Relay output information is selected from n7.16 RO2 function definition, including ready, running, bypass, fault, etc. The default value is in fault mode.
J4		
J5	Programmable relay output K3	Relay output information is selected from n7.15 RO1 function definition, including ready, running, bypass, fault, etc. The default value is in bypass mode.
J6		
A1	+24V	DC 24V positive power supply
A2	RS485 B	RS485 communication terminal B
A3	RS485 A	RS485 communication terminal A
A4	SGND	DC 24V negative power supply
A5	Analog output +	Signals such as motor current, voltage or power can be converted outwards. The output signal is 0/4~20mA.
A6	Analog output -	
P1	Programmable digital input common terminal	Programmable digital input common terminal.
P2	Programmable digital input DI6	Digital input function is selected from n7.05 DI6 function definition, including terminal start, terminal stop, terminal emergency stop, etc. The default value is in terminal start mode.

P3	Programmable digital input DI5	Digital input function is selected from n7.04 DI5 function definition, including terminal start, terminal stop, terminal emergency stop, etc. The default value is in terminal stop mode.
P4	Programmable digital input DI4	Digital input function is selected from n7.03 DI4 function definition, including terminal start, terminal stop, terminal emergency stop, etc. The default value is in terminal unused mode.
D1	Control board power supply L	
D2	Control board power supply N	
D3	Grounding terminal	

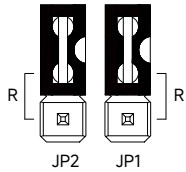
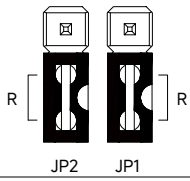
Notes:

a) The PE terminal should be reliably grounded. Otherwise, the sampling voltage is inaccurate;

b) The analog is only current mode without jumper cap;

c) If the RS485 bus termination resistor is required, the JP1/JP2 jumper caps must be properly configured.

RS485B us terminal resistor jumper terminal:

Jumper JP1/JP2: RS485 bus terminal resistor selection (default: no terminal resistor connected)	
	No terminal resistor connected
	Terminal resistor connected

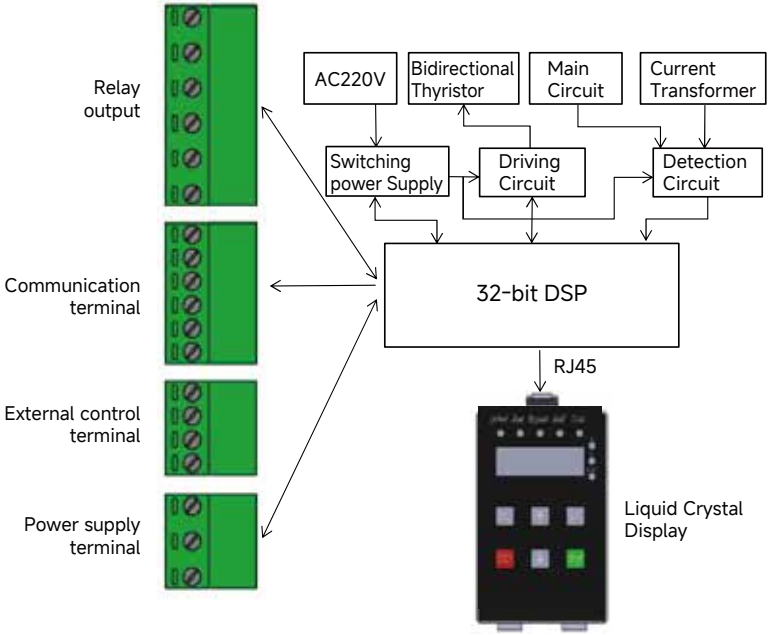
3.5 Control Circuit Schematic Diagram

1. Connect the control terminals with Multi-core shielded cable or twisted pair. When using a shielded cable (near one end of the soft starter), connect it to the ground terminal PE of the soft starter.

2. Separate the wiring of the control circuit from the wiring of the main circuit, placing the two in one pipe or slot is forbidden.

3. Fix the control cable properly when wiring, keep it 20cm away from the main circuit and the strong current line (including the power line, motor line, relay, contactor connection line, etc.), and avoid parallel wiring. Vertical wiring is recommended to prevent external interference from causing soft starter to malfunction. For the terminal connection diagram, see Section 3.4 Control Terminal Wiring.

Control circuit schematic diagram is as follow:



Control circuit schematic diagram

Danger

- Generally, without reinforced insulated wires, the control line contacts the live part of the main circuit directly and would result in the danger of high voltage of the main circuit entering the control circuit if the insulation layer of the wire is damaged for some reason.

Warning

- Mind if there's interference from the soft starter, motor, and wiring.
- Mind if the sensors and equipment around the soft starter malfunction.

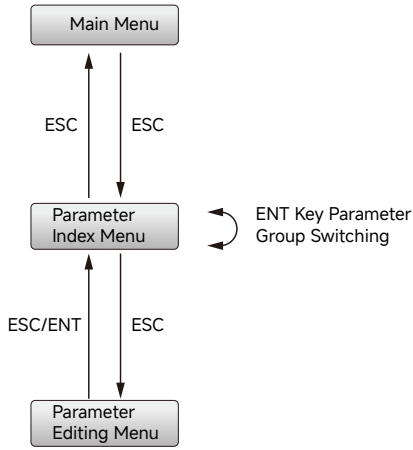
4 Operation Panel

Contents

This chapter introduces the information about the data display on the operation panel.

4.1 LED Panel

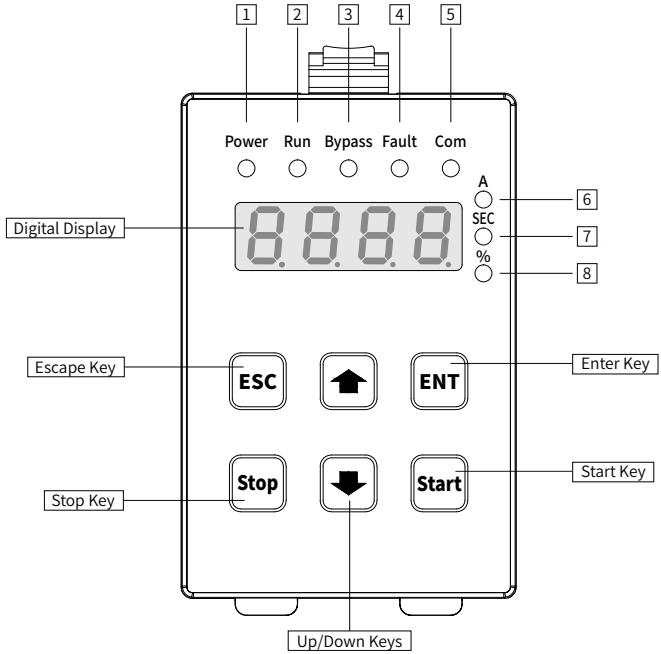
4.1.1 Menu switching flowchart



Menu switching flowchart

4.1.2 LED panel style

1. Operation panel



2. Indicator status

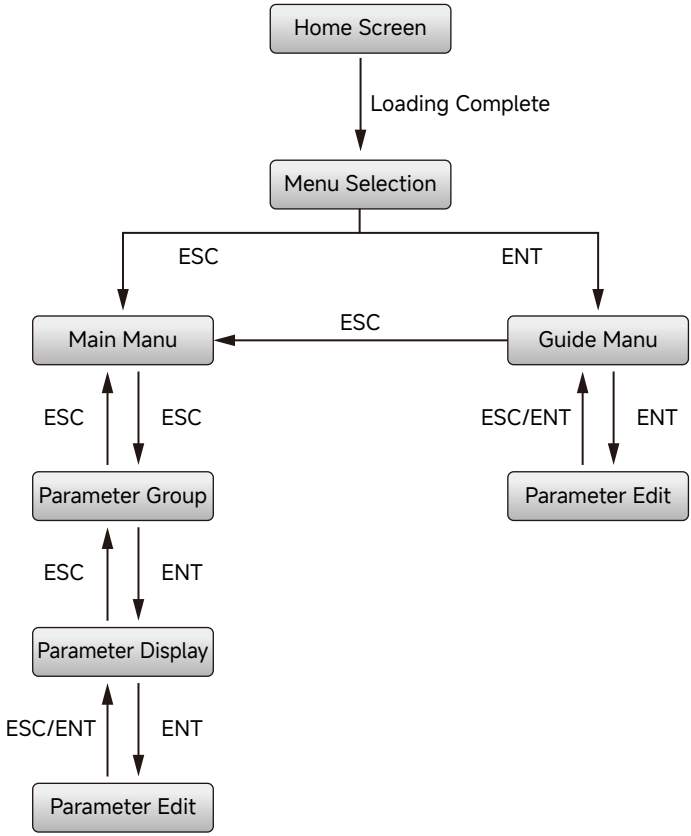
Indicator No.	Name	Indicator Status	Indicator Meaning
1	Power (Power Light)	On	The device has been connected to the power supply.
		Off	The device is not connected to the power supply.
2	Run (Running Light)	Flash	The device is soft starting, unbypassed.
		On	The device is in bypass mode.
		Off	The device is stopped.
3	Bypass (Bypass Light)	On	The device is bypassed
		Off	The device is not bypassed
4	Fault (Fault Light)	On	The device is failed
		Off	The device is fault-free.
5	Com (Communication Light)	On	When parameter n0.01 is set to 3.
		Off	When parameter n0.01 is set to 0.
		Flash	When parameter n0.01 is set to 1 or 2.
6, 7, 8	Unit Light		

3. Key function description

Key	Name	Function
ESC	Escape/Parameter key	1. Return to the previous menu; 2. Go to the parameter display menu; 3. Go to the parameter setting menu.
ENT	Enter key	1. Select parameter groups; 2. Confirm and save parameter value.
Stop	Stop key	1. Stop the device; 2. Reset device faults or restart the DSP by press and hold the stop key for 6s.
Start	Start key	Start the device.
▲	Up select key	Adjust parameters/ Page navigation.
▼	Down select key	
Stop + ENT	Combination key	Hold down the “STOP” and “ENT” keys simultaneously for over 5s to stop the device immediately (Emergency stop).

4.2 LCD panel

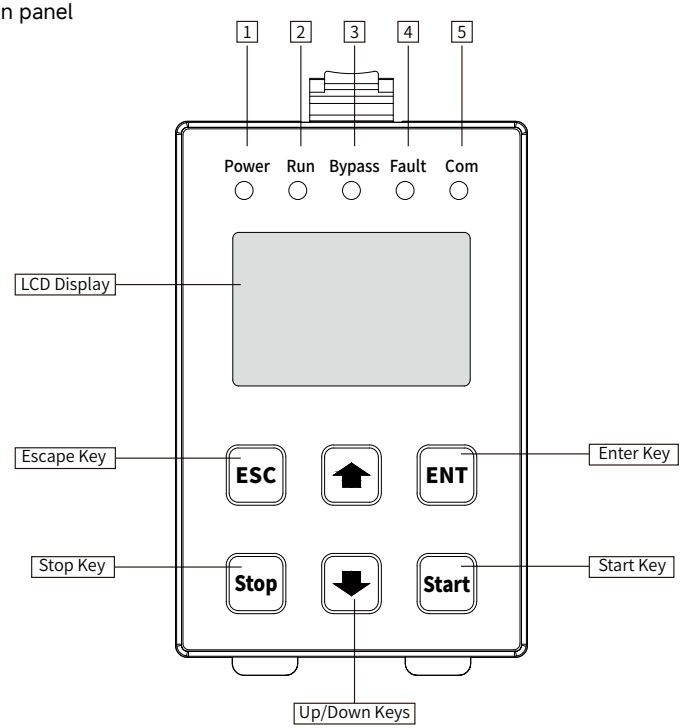
4.2.1 Menu switching flowchart



Menu switching flowchart

4.2.2 LCD panel style

1. Operation panel



2. Indicator status

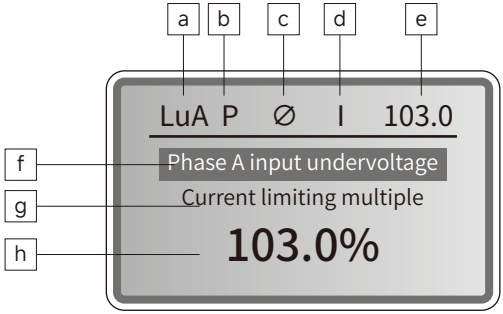
Indicator No.	Name	Indicator Status	Indicator Meaning
1	Power (Power Light)	On	The device has been connected to the power supply.
		Off	The device is not connected to the power supply.
2	Run (Running Light)	Flash	The device is soft starting, unbypassed.
		On	The device is in bypass mode.
		Off	The device is stopped.
3	Bypass (Bypass Light)	On	The device is bypassed
		Off	The device is not bypassed
4	Fault (Fault Light)	On	The device is failed
		Off	The device is fault-free.
5	Com (Communication Light)	On	When parameter n0.01 is set to 3.
		Off	When parameter n0.01 is set to 0.
		Flash	When parameter n0.01 is set to 1 or 2.

3. Key function description

Key	Name	Function
ESC	Escape/ Parameter key	1. Return to the previous menu; 2. Switch between “main Menu” and “parameter Group Menu”.
ENT	Enter key	1. Enter the next level menu; 2. Confirm and save parameter value.
Stop	Stop key	1. Stop the device; 2. Reset device faults or restart the DSP by press and hold the stop key for 6s.
Start	Start key	Start the device.
▲	Up select key	Adjust parameters/ Page navigation.
▼	Down select key	
Stop + ENT	Combination key	Hold down the “STOP” and “ENT” keys simultaneously for over 5s to stop the device immediately (Emergency stop).

4.2.3 Home page view

1. LCD panel



2. LCD description

LCD No.	Meaning
a	Display of fault number. For details, see 6.2 Fault Code List.
b	Display of running status. “ P ” means stop running, “ ↻ ”means forward phase sequence running, and “ ↺ ” means reverse phase sequence running.
c	Display of network. “∅” means no network connection, and “↑ ↓” means network connected. (The network icon may vary depending on the protocol used.)
d	With n1.01 set to "0 - Open Loop Test", the display indicates U. Upon a start/stop cycle, the parameter automatically switches to "1 - Closed Loop 1", following which the display indicates I.
e	Set Current limiting multiple.
f	Current fault/ prompt.
g	Current displayed data name.
h	Main display value. Press  or  to switch it.

5 Function Parameters

Contents

This chapter mainly introduces the parameters of the control program.

5.1 Parameter List

Index	Name/ Selection	Description	Def	FbEq
n0 Basic function group		Setting of operation command source selection, motor control mode selection, data protection, etc.		
n0.01	Operation command mode	Select start/stop command signal source.	0	1=1
	0-Operation panel	Control start/stop using the operation panel.		
	1-Terminal status	Control start/stop using the digital input terminal.		
	2-Terminal retention	Trigger start/stop with the digital terminal edge. To use the terminal retention function, see n7 group parameter of terminal function.		
	3-Network	Control start/stop using networks, including Modbus RTU and PROFIBUS DP.		
n0.02	Stop mode	Select the stop mode after receiving the stop command.	0	1=1
	0-Soft stop	Disconnect the bypass contactor, if the soft starter is bypassed, the output voltage drops from the grid voltage to the initial voltage and the motor slowly stops; if it is in the process of soft starting, the output voltage drops from the present voltage to the starting voltage, and the motor slowly stops.		
	1-Emergency stop	Stop the SCR triggering/disconnect the bypass contactor, and the motor coast to stop.		
n0.03	Reset restart	If a transient failure occurs within the set time when the parameter is greater than 0, the device can automatically reset and restart.	0 .0	10=1s
	0 .0 ~ 60.0			
n0.04	Running delay	Startup delay after a startup command is received.	1.0	10=1s
	1.0 ~ 20.0			
n0.05	First acceleration time	Refers to the time the output voltage increases from the "start voltage" (about 15% of the grid voltage) to the "grid voltage". The time is automatically extended due to the current limiting mode.	8.0	10=1s
	1.0 ~ 60.0			

n0.06	First deceleration time	Refers to the time the output voltage decreases from the "grid voltage" to the "starting voltage" (approximately 15% of the grid voltage) in soft stop mode after the bypass contactor is disconnected.	3.0	10=1s
	1.0 ～ 60.0			
n0.07	Reserved			
n0.08	Second acceleration time	During the motor starting process, when the motor speed is close to the rated speed, the current will automatically and rapidly decrease. When the current drops to the parameter n1.22 set value, the second acceleration and deceleration time can be started to quickly output to the full voltage and bypass to accelerate the starting process.	3.0	10=1s
	1.0~60.0			
n0.09	Second deceleration time		3.0	10=1s
	1.0~60.0			
n0.10	Reserved			
n0.11	Check run command		1	1=1
	0-Invalid	The device does not check for a startup command after being energized. If a startup command exists, it takes effect.		
	1-Valid	The device checks for a startup command after being energized. If a startup command exists, it should be reset externally and resent. Otherwise, the startup command is invalid.		
n0.12	Emergency stop chain delay	After receiving the emergency stop signal, the device delays the SCR trigger/ bypass contactor disconnection.	0.2	10=1s
	0.0 ～ 10.0			
n0.13	Data protection	Used to store access permissions for modifying protection system parameters and the initialization password. Designed exclusively for manufacturer debugging. Users are advised not to modify this setting.		
	100	Resets all parameters to factory settings.		
n0.14	Model code	Factory parameters are loaded according to each model's settings. Set before delivery, they are not allowed to be modified.	0	1=1

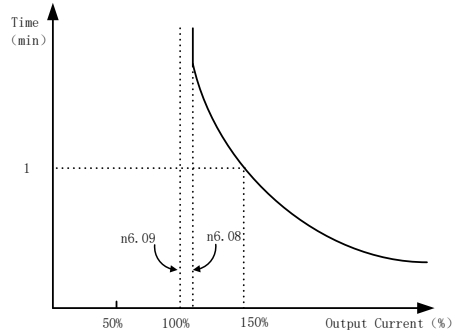
Index	Name/Selection	Description	Def	FbEq
n1 Control parameter group		Setting of soft starter control parameters		
n1.00	Grid frequency selection	Select the frequency of the current power grid.	0	1=1
	0-50Hz			
	1-60Hz			
n1.01	Pulse trigger mode	Soft starter mode selection. 0 is the test mode, flat push trigger pulse according to the synchronization signal. The normal energized motor should be in mode 1, otherwise there will be motor vibration and pulse loss.	1	1=1
	0- Open loop test	Test mode. Flat push trigger pulse according to the synchronization signal. The firing angle turns from the start angle to n1.06.		
	1- Closed loop 1	Current limited start. Control the motor current through conduction feedback state closed loop.		
	2- Closed loop 2	Current limited start. Control the motor current through the synchronization signal output firing angle. When the motor is about to reach the rated speed, the motor power Angle changes rapidly and switches to the 1 mode. (Use in weak grid conditions)		
n1.02	Jump enabled	Output a high voltage pulse when starting to increase the starting torque to cope with some static friction force of large loads.	0	1=1
	0- Invalid			
	1- Valid			
n1.03	Jump voltage	Voltage pulse amplitude.	50.0	10=1%
	20.0~100.0			
n1.04	Jump time	Voltage pulse holding time.	2.0	10=1s
	0.1~20.0			
n1.05	Initial voltage	The output voltage at the first trigger.	15.0	10=1%
	15.0~80.0			
n1.06	Termination trigger Angle		90	1=1°
	0~120			
n1.07	Mode switch connection Angle		112	1=1°
	90 ~ 115			

n1.08	Current tracking Angle compensation		0	1=1°
	0 ~ 20			
n1.09	Conduction detection mode		1	1=1°
	0-Edge			
	1-State			
n1.10	Current turn-off Angle filtering time		50	1=1ms
	20 ~ 500			
n1.11	Current limiting mode selection	Valid when parameter n1.01 is in closed loop 1.	0	1=1
	0-Holding	The device's output voltage does not increase while waiting for the motor to accelerate. The output voltage continues to increase when the starting current < the starting current limit value.		
	1-Regulating	Control output voltage through the P1 regulator according to the set current limiting multiple, matching parameters: n1.13 ~ n1.17.		
n1.12	Start current limiting multiple	The maximum limit value of the starting current. One of the main control parameters. After inputting the motor nameplate information, the soft starter can configure the starting current according to the field conditions before starting. Calculation formula: Start current limiting multiple = $\frac{\text{Start current}}{\text{n3.02}} \times 100\%$	300.0	10=1%
	100.0~800.0			
n1.13	Starting current limiting hysteresis	Used when parameter n1.11 is in closed loop.	5.0	10=1%
	2.0 ~ 10.0			
n1.14	Start current limiting time		10.0	10=1s
	2.0 ~ 30.0			
n1.15	Current regulator ratio		4.000	1000=1
	0.000 ~ 30.000			
n1.16	Current regulator integral		300	1=1ms
	100 ~ 2000			
n1.17	Current regulator limiting		50.0	10=1%
	0.0 ~ 100.0			

n1.18	Power grid synchronization signal compensation Angle	Related parameters of synchronous PLL.	2	1=1
	-30 ~ 30			
n1.19	Synchronous PLL ratio		0.500	1000=1
	0.100 ~ 4.000			
n1.20	Synchronous PLL integral		20	1=1ms
	5 ~ 200			
n1.21	Synchronous PLL output limiting		5.0	10=1%
	0.5 ~ 10.0			
n1.22	Mode switch current		80.0	10=1%
	20.0 ~ 100.0			
n1.23	Minimum downtime interval		6.0	10=1s
	2.0 ~ 900.0			
n1.24	Main circuit wiring direction selection	When reconnection of the cable is inconvenient after the soft motor is connected, set this parameter to change the inlet and outlet mode.	0	1=1
	0- Lower outlet			
	1- Upper outlet			

Index	Name/Selection	Description	Def	FbEq
n3 Motor parameter group		Set the rated parameters of the motor		
n3.00	Rated power	Motor rated power	50.0	10=1kW
	0.1~6000.0			
n3.01	Rated voltage	Motor rated voltage	380	1=1V
	1~60000			
n3.02	Rated current	Motor rated current	44.0	10=1A
	0.1~999.9			
n3.03	Rated frequency	Motor rated frequency	50.00	100=1Hz
	20.00~600.00			
n3.04	Rated speed	Motor rated speed	1491	1=1r/min
	100~30000			
n3.05	Motor parameter test	Reserved	0	1=1

Index	Name/ Selection	Description	Def	FbEq
n6 Fault protection group		Fault protection function		
n6.00	Number of fault self-reset times	Number of fault self-reset times. If the parameter is 0, this function is invalid.	0	1=1
	0 ～ 100			
n6.01	Overheating reference temperature	When the SCR temperature exceeds the set value, output "heat sink overheating" fault.	85.0	10=1 °C
	5.0 ～ 120.0			
n6.02	Grounding protection enabled	Output grounding protection function enabled/ disabled.	0	1=1
	0-Invalid			
	1-Valid			
n6.03	SCR trigger failure protection enabled	After the trigger pulse is sent to SCR, if it is detected that SCR is actually not on (trigger failure), and the number of trigger failures exceeds the set value of this parameter within 2s detection window, the soft start process is stopped. If the parameter is set to 0, the protection function is disabled.	10	1=1
	0 ～ 40			
n6.04	Undervoltage enabled	Input undervoltage protection function. "0" means the function is disabled. "1 ～ 30" means the function is enabled, and the delay protection is n6.04 * 0.1s.	5	1=1
	0 ~ 30			
n6.05	Undervoltage trip value	Input undervoltage protection reference value. If the voltage is lower than this value, the undervoltage protection is enabled. It will automatically reset after the input power supply is normal. Calculation formula: Undervoltage trip value = n3.01 × n6.05	30.0	10=1%
	0 .0~100.0			
n6.06	Overcurrent enabled	Output transient overcurrent protection function enabled/ disabled.	1	1=1
	0-Invalid			
	1-Valid			
n6.07	Overcurrent trip value	Output transient current. If the output current is higher than this value, the overcurrent protection is enabled. Calculation formula: Overcurrent trip value= n3.02 × n6.07	600.0	10=1%
	200.0~800.0			

n6.08	Inverse time starting current	The electronic thermal relay mode. The motor is protected according to the mathematical model of the motor's current thermal characteristics. When the output current of the device > parameter n6.08 set value, the system starts the internal timer according to the time t specified in the following formula: $t=\frac{0.25}{(k-1)^2}$ (min) $k=\frac{I}{n6.09\times n3.02}$ Note: I is the effective value of the motor current. K is the dimensionally homogeneous ratio between the actual motor current and the reference current of n6.09, that is, the overload multiple.  Inverse time curve Notes: 1) The inverse time feature is disabled if the inverse time starting current equals 300.0%. 2) The inverse time feature is enabled if the inverse time starting current is greater than the reference current. 3) The inverse time feature takes effect after the power frequency bypass operation. The default parameter is 1.5 times 1 minute, and the motor overloaded protection action.	120.0	10=1%
	0.0~300.0			
n6.09	Inverse time reference current		100.0	10=1%
	10.0~300.0			
n6.10	Output phase loss enabled	If the output phase loss current value exceeds the set value after the "full voltage" operation, the output phase loss protection action. Calculation formula: Phase loss trip value=n3.02 × n6.11	1	1=1

	0- Invalid			
	1- Valid			
n6.11	Output phase loss trip value		10.0	10=1%
	1.0~10.0			
n6.12	Conduction feedback test enabled	In the ready state, when the input power is ready and the motor is connected, check whether the feedback signal is normal. If the fault "* Phase conduction feedback error" is displayed, the possible causes are as follows: 1) Any phase feedback loss, trigger board hardware abnormal synchronization loss; 2) The input voltage detection wiring is misaligned, and the feedback does not correspond to the phase voltage detection; 3) RC disconnection or phase loss. Note: The protection automatically resets after action.	1	1=1
	0- Invalid			
	1- Valid			
n6.14	Breakdown detection voltage threshold	In the ready state, when the input power is ready and the motor is connected, the voltage at both ends of any level SCR is lower than this set value means thyristor breakdown protection (may also trigger board voltage detection circuit abnormal). The parameter equals 0 and protection is prohibited.	0	1=1V
	0~1000			
n6.16	Starting timeout protection	The total start time (from the beginning of the start time to the bypass signal is sent) exceeds the set value, the protection action, and the start process terminates.	60.0	10=1s
	10.0~120.0			
n6.20	Phase sequence protection enabled	Motor phase sequence protection. When the positive sequence is allowed, the device will report an error if the phase sequence is incorrect.	0	1=1
	0-Invalid			
	1-Positive sequence allowed			
	2-Negative sequence allowed			
n6.21	EOL overload protection enabled		0	1=1
	0-Invalid			
	1-Valid			

n6.22	EOL overload level	Set EOL electronic overload trip level.	1	1=1
	0-10A			
	1-10			
	2-20			
	3-30			
n6.23	EOL overload warning value	Set EOL electronic overload warning value.	60	10=1%
	1.0 ~ 100.0			
n6.24	EOL overload motor cooling coefficient	Factory parameter.	15	1=1
	1~100			
n6.25	Stall protection enabled	Set the stall protection action. This function is available only in the “Full Voltage” state.	0	1=1
	0-Invalid			
	1-Protection	Output fault and shutdown.		
	2-Warning	Output warning only, do not shutdown.		
n6.26	Stall trip value	Set the stall trip value.	400.0	10=1%
	0 ~ 800.0			
n6.27	Stall trip time	The time the current is higher than the trip level before setting the trip.	1.0	10=1s
	0.1 ~ 10.0			
n6.28	Undercurrent protection enabled	Set the undercurrent protection action.	0	1=1
	0-Invalid			
	1-Protection	Output fault and shutdown.		
	2-Warning	Output warning only, do not shutdown.		
n6.29	Undercurrent trip value	Set the undercurrent trip protection value.	50.0	10=1%
	10.0 ~ 90.0			
n6.30	Undercurrent trip time	The time the current is lower than the trip level before setting the trip.	5.0	10=1s
	0.1 ~ 30.0			
n6.31	Current imbalance protection enabled	Set the current imbalance protection action. This protection function can sense whether the current is unbalanced, and normally the three phases’ current should be the same. This protect function is available only in the “Full Voltage” state.	0	1=1
	0-Invalid			
	1-Protection	Output fault and shutdown.		
	2-Warning	Output warning only, do not shutdown.		
n6.32	Current imbalance trip value	Set the level of current imbalance allowed between the phase with the highest current and the phase with the lowest current.	70.0	10=1%

	10.0 ~ 100.0			
n6.33	Current imbalance trip time	The time the current imbalance is lower than the trip level before setting the trip.	10.0	10=1s
	1.0~30.0			
n6.34	Voltage imbalance protection enabled	Set voltage imbalance protection action. This protection function can sense whether the current is unbalanced, and normally the three phases' current should be the same. Imbalanced three-phase voltage may affect the stability of motor operation.	0	1=1
	0-Invalid			
	1-Protection	Output fault and shutdown.		
	2-Warning	Output warning only, do not shutdown.		
n6.35	Voltage imbalance trip value	Set the level of voltage imbalance allowed between the phase with the highest current and the phase with the lowest current.	10.0	10=1%
	1.0~100.0			
n6.36	Voltage imbalance trip time	Set the voltage unbalance time required to trigger a trip.	10.0	10=1s
	1.0~300.0			
n6.37	Overvoltage protection enabled	Set the voltage protection action. This protection can sense if the main circuit voltage is too high. This protection function is invalid in the "Standby" state.	1	1=1
	0-Invalid			
	1-Protection	Output fault and shutdown.		
	2-Warning	Output warning only, no shutdown.		
n6.38	Overvoltage trip value	Set overvoltage trip level, Overvoltage trip =n3.01×n6.38	115.0	10=1%
	100.0~150.0			
n6.39	Overvoltage trip time	The time the voltage is higher than the trip level before setting the trip.	10.0	10=1s
	0.1 ~ 100.0			
n6.40	Bypass disconnect protection enabled	This protection can sense if the bypass contactor or relay is not closed in the full voltage state. This parameter is a software detection function.	1	1=1
	0-Invalid			
	1-Protection			

Index	Name/ Selection	Description	Def	FbEq
n7 Multifunction terminal group		Configure the input and output functions of terminals.		
n7.03	DI4 Function definition		0	1=1
	0- No function definition	The terminal function is invalid.		
	1- Terminal start	When n0.01=1 (Terminal State): closed=start, open=stop; When n0.01=2 (Terminal Retention): open → closed = start;		
	2- Reserved			
	3- Terminal stop	When n0.01=2, open=stop.		
	4- Terminal emergency stop normally open			
	5- Terminal emergency stop normally closed			
	6- Start allowed normally open	Reserved		
	7- Start allowed normally closed	Reserved		
	8- Terminal reset			
	9- Reserved			
	10- Power grid direct start enabled	Bypass starts using the bypass contactor directly; there is no soft start process.		
	11- Bypass feedback	Bypass contactor feedback detection.		
	12- Grid-side feedback	Grid-side contactor feedback detection.		
	13- Operation panel	Command signal source selection. If valid, the signal source is forcibly selected. If invalid, the signal source is determined by parameter n0.01.		
	14- Terminal State			
	15- Terminal Retention			
	16- Network			
	17- Reserved			
	18- Reserved			
	19- Reserved			
	20- Reserved			

	21- External fault 1 normally open	Defined as input function of external fault. Normally open defines a closed fault and normally closed defines a disconnected fault.		
	22- External fault 1 normally closed			
	23- External fault 2 normally open			
	24- External fault 2 normally closed			
	25- External fault 3 normally open			
	26- External fault 3 normally closed			
	27- External fault 4 normally open			
	28- External fault 4 normally closed			
	29- External fault 5 normally open			
	30- External fault 5 normally closed			
n7.04	DI5 Function definition	Same as n7.01	3	1=1
n7.05	DI6 Function definition	Same as n7.01	1	1=1
n7.15	RO1 Function definition	Select the relay output RO1 action.	2	1=1
	0- Invalid	No corresponding function.		
	1- Fault	When there's an equipment fault, the relay engages.		
	2- Run	When the equipment runs, the relay engages. Generally contains the whole process of running the soft starter, including startup and bypass.		
	3- Ready	When the device is starting, the relay engages.		

	4- Starting	When the device is ready, the relay engages. Generally begins with the start of the soft starter and ends with switching to bypass.		
	5- Bypass	Drive bypass contactor open/close.		
	6- Grid-side	Drive grid-side contactor open/close 1. During equipment operation, the relay is engaged (closed). 2.1 If a DI point is configured as "11 - Bypass Feedback" and an actual bypass feedback signal is present, the relay will disengage (open) when the equipment enters bypass operation mode and re-engage (close) upon exiting bypass operation. 2.2 If no DI point is configured as "11 - Bypass Feedback", the relay will not disengage even if the equipment enters bypass operation mode. 3. After the equipment stops completely, the relay disengages (opens) again.		
	7- Current-limiting	When the device is in current-limiting state, the relay engages.		
	8- Normally closed	When the main board is powered on, the relay engages.		
	9- Major fault	When there's a major fault, the relay engages. The relay outputs only when the device reports fault"Lu2", "LuA", "LUB", and "LUC".		
	10- Input voltage loss	When there's voltage loss of input power supply, the relay engages. The relay closes if the power supply voltage is 0.		
	11- Input normal	When there's normal input power supply, the relay engages.		
	12- Bypass combined pulse	Send bypass switch combined pulse, and the pulse duration is 2s.		
	13- Bypass split pulse	Send bypass switch split pulse, and the pulse duration is 2s.		
	14- Run command feedback	When the device receives an external start command, the relay engages. The relay will disconnect if the device stops.		
	15- Grid-side combined pulse	Send output switch combined pulse, and the pulse duration is 2s.		
	16- Grid-side split pulse	Send output switch split pulse, and the pulse duration is 2s.		
	17-Undervoltage fault	When the power grid is undervoltage, the relay engages. Matching parameters: n6.04, n6.05.		
	18- Overvoltage fault	When the power grid is overvoltage, the relay engages. 1.15 times the rated voltage overvoltage protection.		

	19- Ground fault	The single-phase ground fault occurs when the phase voltage is unbalanced and the line voltage is normal.		
	20- Input combined pulse	Send input switch combined pulse, and the pulse duration is 2s.		
	21-Input split pulse	Send input switch split pulse, and the pulse duration is 2s.		
	22- Fan operation	The drive signal of the fan operation of the soft starter can be used to detect whether the internal program successfully drives the fan operation, and is not used as a feedback signal of the fan operation.		
	23- Overload	When the device is overload, the relay engages.		
	24- Line Contactor	Connects to the line contactor coil to control its opening and closing. During start-up, the line contactor closes first, followed by a delayed start of the soft-starter. During shutdown, the line contactor opens after a time delay.		
	25- Capacitor Switching	Capacitor switching is activated with a time delay after the soft-starter operates at line frequency.		
n7.16	RO2 Function definition	Same as n7.15	1	1=1
n7.17	RO3 Function definition	Same as n7.15	5	1=1
n7.25	RO output fault delay	RO Output delay time when “1- Fault” is selected.	2 .0	10=1s
	0 .0~10.0			
n7.40	AO function definition	Select the AO output signal of the analog terminal. The default value is 4 to 20mA.	0	1=1

	0- Ia	Phase A outputs phase current. Maximum range=n3.02×6		
	1- Ib	Phase B outputs phase current. Maximum range=n3.02×6		
	2- Ic	Phase C outputs phase current. Maximum range=n3.02×6		
	3- Uab	Line voltage Uab. Maximum range=n3.01×2		
	4- Ubc	Line voltage Ubc. Maximum range=n3.01×2		
	5- Uca	Line voltage Uca. Maximum range=n3.01×2		
	6- Reserved			
	7- Reserved			
	8- Reserved			
	9- Network mapping 1	Maximum range=8192		
	10- Network mapping 2	Maximum range=8192		
	11- Power	Output power. Maximum range=n3.00×2		
	12- Torque	Output torque. Maximum range=200%		

n7.41	AO gain	n7.41 and n7.42 combine to form a linear function relationship between the internal digital per unit output and the analog terminal AO analog. The output capacity of the AO analog current port is 0~20mA, and the per unit value of the output variable can be selected through the parameters of n7.40 to achieve a variety of output relationships such as 0~10mA, 0~20mA, 4~20mA. Typical configurations are as follows: 1) 0~10mA output mode selection parameters: n7.41=50.0%、n7.42=0.0%; 2) 0~20mA output mode selection parameters: n7.41=100.0%, n7.42=0.0%; 3) 4~20mA output mode selection parameters: n7.41=80.0%, n7.42=40.0%; Note: The calculation formula between the analog AO output and gain and offset is as follows: k: n7.41; B: n7.42; Xout: Reference value of output variable, such as output frequency, current, voltage, etc.; Xbase: Baseline value of output, such as the highest frequency, current reference, voltage reference, etc.; Amax=20; Aout: AO actual output current; (1/2 in the formula indicates that the output has twice the output margin, allowing a wide range of observations of the output) $Aout=\frac{1}{2}\ Amax(\frac{Xout}{Xbase}\times k+B)$	80.0	10=1%
	0.0~220.0			
n7.42	AO offset		40.0	10=1%
	0.0~50.0			

Index	Name/ Selection	Description	Def	FbEq
nB Device authorization group		The factory-authorized parameters for the operation of the soft starter		
nB.00	Parameter display		0	1=1
	0 ~ 10			
nB.01	Device ID-High	Read only	0	1=1
nB.02	Device ID-Low	Read only	0	1=1
nB.03	Device random code	Read only	0	1=1
nB.04	Recharge operation counts		0	1=1
	0 ~ 65535			
nB.05	Recharge operation duration		0	1=1h
	0 ~ 65535			
nB.06	Recharge authorization code		0	1=1
	0 ~ 65535			
nB.07	Remaining operation counts	Read only	50	1=1
nB.08	Remaining operation duration	Read only	720	1=1h
nB.09	Reserved		0	

Index	Name/ Selection	Description	Def	FbEq
nE Panel display group		Panel parameters Function Settings.		
nE.00	Language	Display language selection	0	1=1
	0- 中文	Simplified Chinese		
	1-English	English		
	2-Russian	Russian		
nE.01	Main running displays	Main display data of the operation panel while running.	2	1=1
	0-Current limiting multiple			
	1-Integrator output			
	2-Output current			
	3-Output voltage			
	4-Power grid voltage			
	5-Grid frequency			
	6-Phase sequence			
	7-Trigger Angle			
	8- Turn-off Angle			
	9-Torque			
	10-Set			
	11-Electrical Energy			
	12-Power factor			
	13-Power			
	14-Temperature			
nE.02	Main stop displays	Same as nE01	0	1=1
nE.03	Secondary display1	Same as nE01	4	1=1
nE.04	Secondary display2	Same as nE01	8	1=1

nE.05	Parameter download and upload	Upload and download parameters through the operation panel key combination, to complete the quick backup and replacement of control panel parameters. Key combination: “ENT” and “↓”.	0	1=1
	0- Invalid			
	1- Download parameters	Parameter transmission direction: Control Panel → Operation panel		
	2- Upload parameters	Parameter transmission direction: Operation panel → Control Panel		
nE.06	MF Function definition	Define the function key MF’s function	0	1=1
	0- Invalid			
	1- Emergency stop			
	2- Local/ Remote	After n0.01 is set to non-panel startup, hold down the function key MF to set the command source switch in the operation panel and n0.01.		
nE.07	Current display mode		1	1=1
	0- Combined current			
	1- Rotating current			
nE.08	Current rotation time	The main window shows the cycle interval of the three-phase current. This parameter is valid when nE.07=1.	10	10=1s

Index	Name/ Selection	Description	Def	FbEq
nF Communication group		Communication parameter setting of Modbus and PROFIBUS DP protocols. For details, see “Chapter 7 Communication Protocol”.		
nF.00	Communication mode	Select a serial communication mode.	1	1=1
	0-Invalid	Not in use		
	1-Modbus	Modbus RTU		
	2-DPV0(80B5)	PROFIBUS DP communication protocol		
	3-DPV0(0812)	PROFIBUS DP communication protocol		
	4-DPV1(0812)	PROFIBUS DP communication protocol		
nF.01	Communication station address	Define serial communication station address, including Modbus RTU and PROFIBUS DP.	1	1=1
	1~255			
nF.02	Baud rate	Define the baud rate of Modbus RTU.	1	1=1
	0-4800bps			
	1-9600bps			
	2-14400bps			
	3-19200bps			
	4-24000bps			
	5-28800bps			
	6-33600bps			
	7-38400bps			
	8-43200bps			
	9-48000bps			
	10-52800bps			
	11-57600bps			
nF.03	Check		1	1=1
	0-N none check			
	1-O odd check			
	2-E even check			
nF.04	Communication timeout	Defines the timeout protection period for communication interruption. The timer starts when the first communication is completed. When the communication is interrupted, and the duration exceeds the set time of this parameter, the device stops and displays a communication fault. After the reset, the device exits the protected state and the function is set to be disabled within 60s.	60.0	10=1s
	0.5~60.0			

Index	Name/Selection	Description	Def	FbEq
nP Manufacturer parameter group		Factory parameters, general factory Settings, do not recommend customer Settings.		
nP.00	Factory parameter password		0	1=1
	0~9999			
nP.01	Device current reference	Configured before delivery and cannot be modified	125.0	10=1A
	1.0~1500.0			
nP.02	Device voltage reference	nP.02=Grid reference voltage× √ 2	540	1=1V
	10 ~ 20000			
nP.03	Output pulse polarity		1	1=1
	0-Low-level conduction			
	1-High-level conduction			
nP.04	Output pulse mode	SCR triggers pulse mode.	1	1=1
	0-Double narrow pulse			
	1-Double narrow pulse train			
	2-Wide pulse			
nP.05	Electricity meter high register (MWh)	Used for electricity meter correction.	0	1= 1MWh
nP.06	Electricity meter low register (kWh)	Used for electricity meter correction.	0	10= 1kWh
nP.07	Asynchronous debugging enabled	Used to forcibly trigger the SCR test when there is no main power supply. The system automatically restores to 0 if power-on again.	0	1=1
	0-Invalid			
	1-Valid			
nP.08	Reference voltage at current zero-crossing		4.0	10=1%
	0.5 ~ 20.0			
nP.09	Terminal/keyboard filtering frequency	Input terminal filtering frequency.	5	1=1
	2 ~ 10			

nP.10	AD zero-point correction enabled	Used to automatically correct the current and voltage sampling data, correct once before leaving the factory or when replacing the sensor, otherwise no need to modify; After the parameter is written for about 2s, the zero point correction is completed and automatically reset and restore the forbidden state; Automatically correction reports fault of parameter index out of range, indicating that the sensor is faulty or the hardware is seriously out of order. This function automatically refreshes parameters nP.11 to nP.19.	0	1=1
	0-Invalid			
	1-Valid			
nP.11	Phase A current zero-point correction value		0	1=1
	-200~200			
nP.12	Phase B current zero-point correction value		0	1=1
	-200 ~ 200			
nP.13	Phase C current zero-point correction value		0	1=1
	-200 ~ 200			
nP.14	Phase A output voltage zero-point correction value		0	1=1
	-200 ~ 200			
nP.15	Phase B output voltage zero-point correction value		0	1=1
	-200 ~ 200			
nP.16	Phase C output voltage zero-point correction value		0	1=1
	-200 ~ 200			
nP.17	Phase A input voltage zero-point correction value		0	1=1
	-200 ~ 200			
nP.18	Phase B input voltage zero-point correction value		0	1=1
	-200 ~ 200			
nP.19	Phase C input voltage zero-point correction value		0	1=1

	-200 ~ 200			
nP.21	Phase A current correction factor	Modify current and voltage sampling; Correction method: First set the correction coefficient to 1.000, then observe the display value and measured value of the display screen, and calculate the correction coefficient. Calculation formula: $\text{Correction factor} = \frac{\text{Actual measured value}}{\text{Displayed value}} \times 100\%$	1.000	1000=1
	0.900 ~ 1.100			
nP.22	Phase B current correction factor		1.000	1000=1
	0.900 ~ 1.100			
nP.23	Phase C current correction factor		1.000	1000=1
	0.900 ~ 1.100			
nP.24	Phase A output voltage correction factor		1.000	1000=1
	0.900 ~ 1.100			
nP.25	Phase B output voltage correction factor		1.000	1000=1
	0.900 ~ 1.100			
nP.26	Phase C output voltage correction factor		1.000	1000=1
	0.900~1.100			
nP.27	Phase A input voltage correction factor		1.000	1000=1
	0.900 ~ 1.100			
nP.28	Phase B input voltage correction factor		1.000	1000=1
	0.900 ~ 1.100			
nP.29	Phase C input voltage correction factor		1.000	1000=1
	0.900 ~ 1.100			
nP.35	Power grid frequency filtering time constant		2000	1=1ms
	100 ~ 5000			
nP.36	Interrupt automatic adjustment enabled	Automatically corrects the sampling interruption frequency through the grid frequency.	1	1=1
	0-Invalid			
	1-Valid			
nP.40	Wave recording channel 0 Selection	The official RENLE recording tool is applicable. For details, please contact the supplier.	0	1=1
	0 ~ 99			
nP.41	Wave recording channel 1 Selection	Same as nP.40.	1	1=1
nP.42	Wave recording channel 2 Selection	Same as nP.40.	2	1=1

nP.43	Wave recording channel 3 Selection	Same as nP.40.	3	1=1
nP.44	Wave recording channel 4 Selection	Same as nP.40.	4	1=1

Index	Name/Selection	Description	Def	FbEq
nU Fault record group		Warning and fault information parameters generated by the soft starter.		
nU.00	Fault record display	Hide/show nU group parameters	0	1=1
	0	Hide nU group parameters		
	1	Show nU group parameters		
	123	Clear all fault records		
nU.01	Level 1 Fault type	For details about the faults, see Section 6.2 Fault Code Table	0	1=1
nU.02	Level 1 fault Phase A current	The output current when the fault occurs.	0	10=1A
nU.03	Level 1 fault Phase B current		0	10=1A
nU.04	Level 1 fault Phase C current		0	10=1A
nU.05	Level 1 fault starting duration	Running duration when the fault occurs.	0	10=1s
nU.06	Level 2 fault type	Same as nU.01.	0	1=1
nU.07	Level 2 fault Phase A current	Same as nU.02.	0	10=1A
nU.08	Level 2 fault Phase B current		0	10=1A
nU.09	Level 2 fault Phase C current		0	10=1A
nU.10	Level 2 fault starting duration	Same as nU.05.	0	10=1s
nU.11	Level 3 fault type	Same as nU.01.	0	1=1
nU.12	Level 3 fault Phase A current	Same as nU.02.	0	10=1A
nU.13	Level 3 fault Phase B current		0	10=1A
nU.14	Level 3 fault Phase C current		0	10=1A
nU.15	Level 3 fault starting duration	Same as nU.05.	0	10=1s
nU.16	Level 4 fault type	Same as nU.01.	0	1=1
nU.17	Level 4 fault Phase A current	Same as nU.02.	0	10=1A
nU.18	Level 4 fault Phase B current		0	10=1A
nU.19	Level 4 fault Phase C current		0	10=1A

nU.20	Level 4 fault starting duration	Same as nU.05.	0	10=1s
nU.21	Level 5 fault type	Same as nU.01.	0	1=1
nU.22	Level 5 fault Phase A current	Same as nU.02.	0	10=1A
nU.23	Level 5 fault Phase B current		0	10=1A
nU.24	Level 5 fault Phase C current		0	10=1A
nU.25	Level 5 fault starting duration	Same as nU.05.	0	10=1s
nU.26	Level 6 fault type	Same as nU.01.	0	1=1
nU.27	Level 6 fault Phase A current	Same as nU.02.	0	10=1A
nU.28	Level 6 fault Phase B current		0	10=1A
nU.29	Level 6 fault Phase C current		0	10=1A
nU.30	Level 6 fault starting duration	Same as nU.05.	0	10=1s
nU.31	Level 7 fault type	Same as nU.01.	0	1=1
nU.32	Level 7 fault Phase A current	Same as nU.02.	0	10=1A
nU.33	Level 7 fault Phase B current		0	10=1A
nU.34	Level 7 fault Phase C current		0	10=1A
nU.35	Level 7 fault starting duration	Same as nU.05.	0	10=1s
nU.36	Level 8 fault type	Same as nU.01.	0	1=1
nU.37	Level 8 fault Phase A current	Same as nU.02.	0	10=1A
nU.38	Level 8 fault Phase B current		0	10=1A
nU.39	Level 8 fault Phase C current		0	10=1A
nU.40	Level 8 fault starting duration	Same as nU.05.	0	10=1s

Index	Name/Selection	Description	Def	FbEq
nR Monitoring data group		Monitor parameters of the soft starter.		
nR.00	Start current limiting multiple			10=1%
nR.01	Integrator output			10=1%
nR.02	Output current			10=1A
nR.03	Output voltage			1=1V
nR.04	Integrator input			10=1%
nR.05	Grid frequency			100=1Hz
nR.06	Grid sequence	-1: negative phase sequence; 1: positive phase sequence		1=1
nR.07	Reserved			
nR.08	Output voltage A			10=1V
nR.09	Output voltage B			10=1V
nR.10	Output voltage C			10=1V
nR.11	Firing Angle			1=1°
nR.12	Turn-off Angle			1=1°
nR.13	Power factor			100=1
nR.14	Output power			10=1kW
nR.15	Heat sink temperature 1			10=1 °C
nR.16	Heat sink temperature 2			10=1 °C
nR.17	Input voltage A			10=1V
nR.18	Input voltage B			10=1V
nR.19	Input voltage C			10=1V
nR.20	Phase A current			10=1A
nR.21	Phase B current			10=1A
nR.22	Phase C current			10=1A
nR.23	Electricity meter high register (MWh)			1=1MWh
nR.24	Electricity meter low register (kWh)			10=1kWh
nR.25	Prompt number			1=1
nR.26	parameter index out-of-range address			1=1
nR.27	Reserved			1=1
nR.28	System state			bin
nR.29	Hardware terminal state			bin
nR.30	Network control word			1=1
nR.31	Network status word			1=1

nR.32	Device ID Authentication status			1=1
nR.33	Software version number			100=1
nR.34	Unexpected interrupt count			1=1
nR.35	EOL protection hot melt value			10=1%
nR.36	CRC error counter			1=1

Notes:

1. Def: Default value

2. FbEq: Field bus Equivalent: The values displayed in the operation panel correspond to the integer values used for serial communication in a certain proportion.

6 Fault Tracing

Contents

This chapter lists warning and fault information, including possible causes and troubleshooting methods.

6.1 Prompt Information

Prompt No.	Prompt code	Prompt content	Description
3	UErr	ROM write error	Power on the device again is recommended. If the problem persists, contact the device supplier.
4	rts-	Hardware reset	Normal display, disappears naturally after a few seconds.
8	dLY-	Delay waiting	Normal display, disappears naturally after a few seconds.
9	rEt-	Check run command	Normal display, disappears naturally after a few seconds.
11	-EH1	Terminal emergency stop	Emergency stop command reported by the DI terminal set as "Emergency stop normally open/ normally closed" in n7 group parameters. This command forces the device to stop immediately and cannot be started again until the command is lifted.
12	-EH2	External linkage loss	Emergency stop command reported by the DI terminal set as "Enable start normally open/ normally closed" in n7 group parameters. This command forces the device to stop immediately and cannot be started again until the command is lifted.
13	run-	Run command delay	Normal display, disappears naturally after a few seconds.
19	old	Inverse time timer starts	The device is about to be overloaded.
20	CAN	CAN communication fault	Check whether the CAN communication parameters or external connections are normal.
28	AE01	Phase A high current zero drift	Calibration using parameter nP.10 is recommended. If the calibration fails, contact the device supplier.
29	AE02	Phase B high current zero drift	As above.
30	AE03	Phase C high current zero drift	As above.
31	AE04	Motor phase A is not connected	The device fails to detect the A(R/U) phase current correctly during startup, which can be caused by a variety of reasons. Detect the U-phase connection cable or plug and unplug the A(R/U) phase current detection cable. If the problem persists, contact the device supplier.

32	AE05	Motor phase B is not connected	The device fails to detect the B(S/V) phase current correctly during startup. Refer to the previous solution.
33	AE06	Motor phase C is not connected	The device fails to detect the C(T/W) phase current correctly during startup. Refer to the previous solution.
58	-EH3	Bus emergency stop valid	The emergency stop hold command from the CAN communication bus, which forces the device to stop immediately. The device cannot be started again until the command is removed.
60	Sync	Phase identification in progress...	
66	CODE	Secret key error	The software functions of the device have not been unlocked. Contact the device supplier.
67	FErr	Flash memory error	Power on the device again. If the problem persists, contact the device supplier.
68	PASS	Bypass operation	
69	ACOU	Power grid overvoltage warning	The power grid voltage on the incoming side is high. Please check the incoming grid.
70	MNC	Motor is not connected	The device failed to detect a three-phase current correctly during startup. Please check the power cable. If the problem persists, contact the device supplier.
71	AUTO	Automatic run test	Normal display, disappears naturally after the test is completed.
72	PJCE	Grid-side switch is not closed	A DI terminal set the "Grid-side switch feedback", but failed to receive the enable signal. Please check the terminal connection cable or check whether the terminal function is set correctly.
73	Sc2	Motor stalling warning	Please check the no-load motor whether there is a motor stalling phenomenon or foreign matter stuck.
74	LC	Undercurrent warning	1. Test the cable connection 2. Detect motor status 3, check the power supply voltage conditions
75	EAbI	Current imbalance warning	1. Check the motor cable 2. Drive loop 3. Check the current Hall line
76	EAbU	Voltage imbalance warning	1, check the motor cable 2. Drive loop 3. Check the voltage detection loop

77	AEOL	EOL overload warning	

6.2 Fault Code Table

Prompt No.	Prompt code	Prompt content	Description
0	Sc	Overcurrent	1. Check if the motor load is excessive or if there is a mechanical fault. 2. Check for improper start parameter settings: the start current limit is set too low, or the start time is too short. 3. Inspect the IGBTs within the soft-starter. 4. Check whether the supply voltage is normal.
1	pc	Drive protection	
2	ou	Overvoltage	After the SCR trigger fails, the overvoltage self-trigger reaches the set number (n6.19 set value).
3	Lu2	Grid power loss	The three-phase power supply of the grid is disconnected
4	oh	Heat sink overheating	The maximum value of the three-phase heat sink exceeds the set temperature (n6.01 set value).
5	old	Overload	The load is too heavy or the parameter is set low (valid in bypass operation).
6	ou2	Software overvoltage	
12	CE	Serial communication error	Modbus RTU communication is abnormal. Check whether the communication parameters of the master station and slave station match.
15	rErr	EEROM parameter error	Parameter out of bounds. The value of a parameter exceeds the defined upper/lower limits. See r0.26 to find the specific parameter position.
16	CT1	Current transformer open circuit	The Current Transformer's secondary circuit is open. It runs 200ms to determine the output signal of the current sensor.
17	rnd	ground protection	
55	AB1	Current unbalance	
56	AB2	Voltage unbalance	

57	SCr1	Phase A straight-through fault	
58	SCr2	Phase B straight-through fault	
59	SCr3	Phase C straight-through fault	
90	Err1	External fault 1	External fault defined by the multi-function input terminals.
91	Err2	External fault 2	As above.
92	Err3	External fault 3	As above.
93	Err4	External fault 4	As above.
94	Err5	External fault 5	As above.
95	Err6	External fault 6	As above.
96	Err7	External fault 7	As above.
97	Err8	External fault 8	As above.
98	Err9	External fault 9	As above.
99	ErrA	External fault 10	As above.
100	PC1	Phase A Drive Protection	Check the IGBT(s) in the corresponding phase for damage.
101	PC2	Phase B Drive Protection	
102	PC3	Phase C Drive Protection	
106	LuA	Phase A input undervoltage	If the A(R/U) phase input voltage is lower than the n6.05 set value, check the input power supply or voltage sampling loop.
107	LuB	Phase B input undervoltage	If the B(S/V) phase input voltage is lower than the n6.05 set value, check the input power supply or voltage sampling loop.
108	LuC	Phase C input undervoltage	If the C(T/W) phase input voltage is lower than the n6.05 set value, check the input power supply or voltage sampling loop.
109	ScA	Phase A overcurrent	Operate value（n6.07 * n3.02）
110	ScB	Phase B overcurrent	
111	ScC	Phase C overcurrent	
112	LPA	Phase A phase loss	Check the main circuit connection point or voltage sampling loop
113	LPB	Phase B phase loss	
114	LPC	Phase C phase loss	
115	TR1	Phase A triggering failure	The number of SCR triggering failures exceeds the value set in parameter n6.03
116	TR2	Phase B triggering failure	
117	TR3	Phase C triggering failure	

118	Fed1	Phase A conduction feedback error	The phase deviation of the feedback signal is too large in the standby state. Check the voltage sampling wiring position or corresponding drive board feedback signal.
119	Fed2	Phase B conduction feedback error	
120	Fed3	Phase C conduction feedback error	
122	Tend	Startup timeout protection	The startup time exceeds the value set in parameter n6.16
123	RRRY	Bypass contactor failure	Check the DI points in parameter group n7 set for the bypass contactor feedback. For example, if n7.02 is set to "11 - Bypass Feedback", verify that DI3 is wired to the bypass contactor's feedback signal and that the signal itself is normal.
124	ACOU	Power grid overvoltage protection	The input voltage exceeds the value set by parameter n6.38
125	PHE	Phase sequence error protection	Check whether the phase sequence of the power supply is consistent with the parameters in n6.20.
126	EOL	EOL overload protection	
127	Sc2	Motor stall protection	Valid within 5 seconds after bypass operation
128	LC	Undercurrent protection	Valid within 30 seconds after bypass operation
129	EAbI	Current imbalance protection	Valid within 30 seconds after bypass operation
130	EAbU	Voltage unbalance protection	Valid within 5 seconds after bypass operation
131	JCE1	Phase A bypass contactor disconnected	Check whether the A(R/U) phase bypass contactor or contactor feedback line is in good condition
132	JCE2	Phase B bypass contactor disconnected	Check whether the B(S/V) phase bypass contactor or contactor feedback line is in good condition
133	JCE3	Phase C bypass contactor disconnected	Check whether the C(T/W) phase bypass contactor or contactor feedback line is in good condition

7 Communication Protocol

Contents

This chapter describes information related to communication, including how the soft starter enables remote communication through the corresponding adapter module.

7.1 Modbus Communication

The device is configured with RS485 port, supports Modbus RTU protocol, and has 8 data bits and 1 stop bit. For details about the communication parameters, see nF.00 ~ nF.04.

The following is the table of common data communication points.

Register	Channel name	Channel address (DEC)	Display format	Unit	Specification
Hold register, function code 0x06	Network operation command	4096	16-bit Unsigned		1. FWD-Start (1111 1110 XXXX XXXX) (e.g. 65279D)
					2. RST-Emergency stop (with reset): usually used as a reset signal (1111 1011 XXXX) (e.g. 64511D)
					3. STOP-Soft stop: select the function according to n002 (1111 1111 XXXX XXXX) (e.g. 65535D)
					4. EMG-Emergency stop (no reset) (1111 0111 XXXX XXXX) (e.g. 63487D)
					5. Note: Do not send RST too frequently. A STOP signal should be sent 2s after sending RST. RST can not be sent when the device is running, otherwise, it will cause an EMG of the device.
Input register, function code 0x04	Current limiting multiple	0	16-bit Unsigned	%	10 times conversion relation, for example, 135 represents 13.5%
	Power grid frequency	5	16-bit Unsigned	Hz	100 times conversion relation, for example, 5000 represents 50Hz
	Phase sequence	6	16-bit Signed	/	1, forward; -1, reverse
	Phase current R	11	16-bit Unsigned	A	10 times conversion relation, for example, 256 represents 25.6A
	Phase current S	12	16-bit Unsigned		
	Phase current T	13	16-bit Unsigned		

	Prompt	14	16-bit Unsigned	/	For device prompts, refer to Section 6.1
	System state	16	Binary	/	Bit0: 0, Run; 1, Stop;
					Bit1: 0, Forward; 1, Reverse
					Bit3: 0, Standby; 1, Fault
					Bit4: 0, Bypass; 1, Non-bypass
	DI state	17	Binary	/	Input terminal DI state, for example, Bit0 corresponds to DI1, where 0 means low level (input open) and 1 means high level (input closed)
	RO state	18	Binary	/	Output relay RO state, for example, Bit0 corresponds to RO1, where 0 means the relay is open and 1 means the relay is closed.
	Output power	20	16-bit Signed	kW	1 time conversion relation
	Power factor	21	16-bit Signed	/	100 times conversion relation, for example, 99 represents 0.99
	Motor torque	22	16-bit Signed	%	10 times conversion relation, for example, 99 represents 9.9%
	Electricity meter MWh bit	23	16-bit Unsigned	MWh	No conversion relation
	Electricity meter kWh bit	24	16-bit Unsigned	kWh	10 times conversion relation, for example, 99 represents 9.9kWh
	Input line voltage (Uab)	25	16-bit Unsigned	V	1 time conversion relation
	Input line voltage (Ubc)	26	16-bit Unsigned		
	Input line voltage (Uca)	27	16-bit Unsigned		
	Temperature1	31	16-bit Signed	°C	10 times conversion relation, for example, 236 represents 23.6 °C
	Temperature 2	32	16-bit Signed		
	Fault code	96	16-bit Signed	/	For device fault information, see Section 6.2

8 Daily Maintenance

Contents

This chapter mainly introduces the daily maintenance and Servicing of the soft starter.

Subject to the influence of the surrounding environment, such as temperature, humidity, dust, etc., this device needs to be inspected periodically during normal use, and the inside of the device should be dusted and cleaned when necessary.

This device is in vibration during operation, so it is important to check the internal devices of the device periodically to ensure that the fixing screws are not loose and the wires are connected reliably.

It is strictly prohibited to flush the device directly with water.

8.1 Precautions

Before checking and repairing, the following conditions must be met, otherwise there is a danger of electric shock:

1. The soft starter has been disconnected from the power supply.
2. Before the cover is opened, it is measured with a voltmeter that no voltage exists between R, S, and T.
3. Disassembling parts for maintenance and device replacement must be carried out by a professionally trained person.
4. Do not leave metal parts such as screws and washers inside, otherwise there is a danger of damaging the equipment.

8.2 Routine Maintenance

Inspection item	Inspection content	Inspection method	Note
Environment	Temperature	Thermometers	-10 °C ~ 45 °C
	Humidity	Hygrometer	5% ~ 95%, no condensation
	Dust, floc, oil stain	Visual inspection	No dust, no floc
	Vibration	Tactile sensation	No abnormal vibration

Soft starter	Noise	Auditory perception	No abnormal noise
	Odor	Olfactory perception	No odor
	Appearance	Visual inspection	No defects, no deformation
Motor	Temperature	Tactile sensation	Reasonable wind temperature
	Fan	Tactile sensation / Auditory perception	Stable wind speed, uniform sound
	Temperature	Tactile sensation	No abnormal heat
	Odor	Olfactory perception	No odor
	Noise	Auditory perception	No abnormal noise
	Vibration	Sensation	No abnormal vibration

8.3 Regular Inspection

Inspection item	Inspection content	Inspection method
Control terminal screws	Check for loose screws	Tighten the screws
Main circuit terminal screws		
Ground terminal screws		
Control terminal screws		
PCB board	Check for dust and dirt	Remove fully with dry compressed air
Heat sink		
Power Components		

8.4 Storage

Category	存放环境
Temperature	-10 °C～ 45 °C
Humidity	5% ～ 95%，no condensation
Environment	No direct sunlight, no dust, no corrosive gas, no vibration (can be sealed in a plastic bag with desiccant)

Production Quality Commitment

Thank you very much for choosing our SSD1 motor soft starter, we promise that the products we provide are all in line with industry norms or enterprise standards. The products provided by our company are processed with components and materials with stable performance and good reliability, and we promise that each process in the production process is in accordance with the ISO9000 standard or the certification management system that meets the requirements of the relevant national regulations.

1. Warranty Period

a) This product is warranted for 12 months from the date of arrival.

b) The replacement of the components during the warranty period does not affect the overall warranty of the product.

2. Service Items

a) This product is warranted for 12 months from the date of arrival. (Non-standard machines are executed according to the negotiated terms);

b) This product is guaranteed to be returned, exchanged, and warranted against quality problems within one month from the date of arrival;

c) This product is guaranteed to be exchanged and warranted for quality problems within three months from the date of arrival;

d) Disclaimer (Product damage caused by the following reasons is not covered by the warranty).

- The user does not carry out wiring, commissioning, and other operations as required by the user manual.

- The user makes unauthorized modifications to the product or accidentally drops and damages it during installation, etc.
- Damage caused by force majeure: earthquakes, fires, floods, lightning strikes, etc.

Note: for products out of warranty and damage exempted from warranty coverage during the warranty period, our company offers paid services.

3. Responsibility

Neither the Company nor the Company's agents shall be liable for any special, indirect, or secondary damages caused by the Equipment, whether in terms of contract, warranty, tort, strict liability, or any other aspect, including, but not limited to, loss of profit, loss of revenue, loss of use of supplied equipment and related equipment, expenditure of funds, expenditure of substitute equipment, tool fees, service charges, downtime costs and loss to the customer.

雷诺尔

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