Product User Manual

Safety

⊙ Before installing or operating this soft starter, please read and comprehend this manual. Only professionals are qualified to perform installation, repairs, and maintenance on the soft starter.

⊙ Installation and maintenance operations should strictly adhere to this manual, relevant national standards, and industry practices. Otherwise, the manufacturer will not be responsible for any adverse consequences resulting from failure to follow the corresponding guidelines.

⊙ Before the soft starter or motor is maintained, all power inputs must be disconnected.

⊙ After installation, carefully inspect and verify that no components (such as wires, screws, and washers) have fallen into the energized parts.

Warning

⊙ The control section of this product (including the trigger unit and central processor control section) carries dangerous voltages, and the trigger unit has the same high voltage as the main circuit. Improper contact can be extremely dangerous and can cause electric shock accidents.

⊙ After the product is connected to the main power supply, full voltage signals for sampling will still appear at the output of the soft starter, even if the control voltage is disconnected or the starter is stopped.

⊙ The product must be properly grounded to ensure safe operation and to prevent accidental electric shock injuries. It is prohibited to connect power factor correction capacitors to the output terminal of the soft starter.

Contents

1. Function and Characteristics of Soft Starter

The intelligent motor soft starter is a new type of motor starting equipment designed and manufactured with advanced international technology in power electronics, microprocessor technology, and modern control theory. This product can effectively limit the starting current when asynchronous motors start and can be widely used in loads such as fans, pumps, conveyors, and compressors. It is an ideal replacement for traditional reduced voltage starting equipment such as star/delta transformation, auto-transformer reduction, and magnetic control reduction.

Function

- Reduce the starting current of the motor, reduce distribution capacity, and avoid capacity expansion investment.
- Reduce starting stress, and extend the service life of the motor and related equipment.
- Smooth starting and soft stopping eliminate problems like traditional starting equipment's jolting, and water hammer effects.
- Multiple starting modes and a wide range of current and voltage settings can be applied to various load situations, improving processes.
- Comprehensive and reliable protection functions more effectively protect the safety of the motor and related equipment.
- It's suitable for frequent start and stop situations.

Characteristics

- The soft starter uses high-performance microprocessor technology, resulting in enhanced performance and a wider voltage adaptation range.
- Four starting modes are available for selection, allowing optimal motor startup and soft stopping to be maximized.
- Chinese (Mandarin) display mode for easy operation. The display accurately reflects the various operational states of the soft starter, embodying a design philosophy focused on human usability.
- Multiple protective monitoring functions, with a selectable 6-level thermal overload protection based on load requirements. It also allows for querying the last three fault records, offering a basis for fault analysis.
- This product offers a 4~20mA analog output and an RS-485 communication interface (using the MODBUS RTU communication protocol), facilitating parameter configuration, operation, and monitoring via an upper-level computer for achieving highly intelligent control.
- Actual power setting: When the rated power of the soft starter exceeds the actual load power, the rated current of the soft starter can be set based on the actual load, ensuring the alignment of actual power and load to guarantee the accuracy of startup, operation, and protection parameters.
- Programmable output relay: Convenient for achieving interlocking control with other devices.

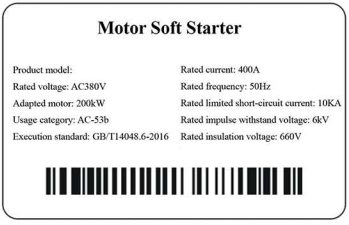
2. Product Model

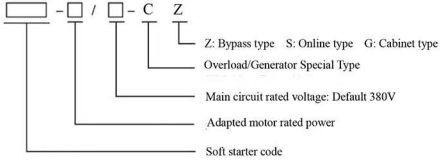
Each soft starter undergoes comprehensive functional and operational tests before leaving the factory. Upon receiving the equipment, users are advised to perform the following steps for inspection. If any issues are identified, please contact the supplier immediately.

Check the product nameplate: Confirm that the received goods match the product you ordered.

Usage category: AC-53a or AC-53b

Compliance with standards: GB/T14048.6-2016





- Check if the product is damaged during transportation, such as internal parts falling off, casing dents, deformations, and disconnected wiring.
- Product usage certificate and user manual: Each soft starter is accompanied by one product usage certificate and one user manual.

3. Operating Conditions

The operating conditions significantly impact the normal usage and lifespan of the soft starter. Therefore, it is essential to install the soft starter in locations that comply with the following usage conditions:

Product Usage Conditions

- Power supply: Mains power, self-owned power stations, diesel generator sets;
- Input voltage: AC 380V (-15% to +15%), 50Hz;
- Applicable motors: Generally, squirrel-cage asynchronous motors (please specify for wound motors when placing an order);
- Starting frequency: Standard products recommend not exceeding 6 starts and stops per hour;
- Cooling method: Bypass type: natural air cooling; Online type: forced air cooling;
- Installation method: Wall-mounted;
- Usage condition: For bypass-type soft starters, a bypass contactor should be connected; online-type soft starters do not require a bypass contactor;
- Protection level: IP20;
- Environmental conditions: In the case of altitudes exceeding 2000 meters, a proportionate reduction in capacity usage is advisable;

  Environmental temperature between -25°C and +40°C;

  Relative humidity not exceeding 95% (at 20°C ±5°C);

  No condensation, no inflammable, explosive, corrosive gases, and no conductive dust;

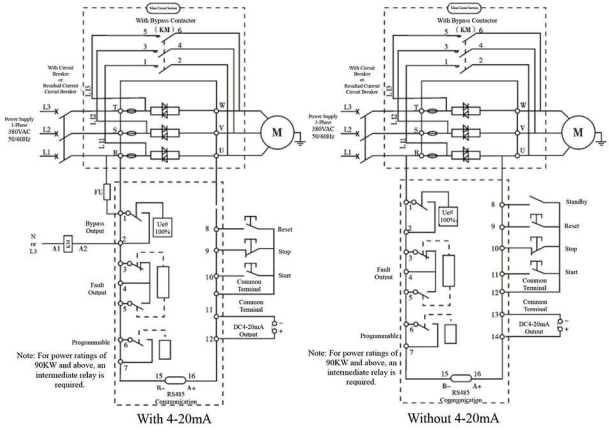
  Indoor installation with good ventilation;

  Vibration less than 0.5 G.

4. Basic Wiring and External Terminals

Figures 4-1 and 4-2 show all the external terminals available for users to use with the soft starter. For detailed functionality, refer to Figure 4-1 "External Terminal Description".

4.1 Basic Wiring Diagram



4.2 Diagram of External Terminals Arrangement for the Soft Starter

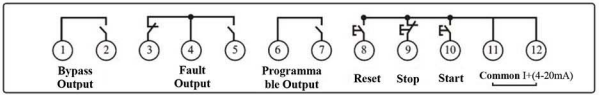


Figure 4-1a Terminal Diagram

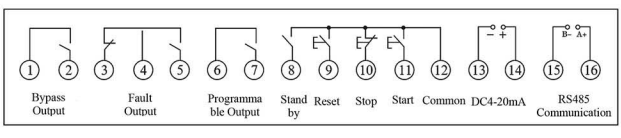
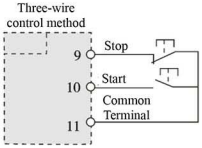


Figure 4-1b Terminal Diagram

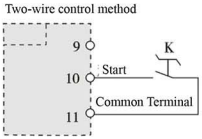
4.3 Description of Soft Starter External Terminals

<table>
<tr><th colspan="2">Terminal Description</th><th colspan="2">Terminal Name</th><th>Description</th></tr>
<tr><td colspan="2" rowspan="3">Main Circuit</td><td>R. S. T</td><td colspan="2">AC power supply input terminals</td><td>Connect to three-phase AC power via circuit breaker (QF)</td></tr>
<tr><td>U. V. W</td><td colspan="2">Soft starter output terminals</td><td>Connect to three-phase asynchronous motor</td></tr>
<tr><td>L11. L12. L13</td><td colspan="2">External bypass contactor dedicated terminals</td><td>For bypass type wiring, refer to Figure 4-1</td></tr>
<tr><td rowspan="12">Control Circuit</td><td rowspan="5">Digital Output</td><td>⑧</td><td colspan="2">External control reset terminal</td><td>Close ⑧ and⑪ for external control fault reset</td></tr>
<tr><td>⑨</td><td colspan="2">External control start terminal</td><td>Open ⑨ and ⑪ for external control stop★★</td></tr>
<tr><td>⑩</td><td colspan="2">External control stop terminal</td><td>Close⑩ and⑪ for external control start★</td></tr>
<tr><td>⑪</td><td colspan="2">Common control signal terminal</td><td>Internal power parameter point</td></tr>
<tr><td>⑫</td><td colspan="2">4-20mA analog terminal</td><td>Analog terminal I+</td></tr>
<tr><td rowspan="5">Relay Output</td><td>①</td><td rowspan="2">Normally open</td><td rowspan="2">External bypass contactor control terminal</td><td rowspan="2">After starting: ①-②closed;
Contact capacity: AC: 5A/250V or 3A/380V
DC: 5A/30V Note: For power ratings of 90KW and above, an intermediate relay must be used.</td></tr>
<tr><td>②</td></tr>
<tr><td>③</td><td>Normally closed</td><td rowspan="3">Fault output terminal</td><td rowspan="3">Contact capacity:
AC: 1A/125V
DC: 2A/30V</td></tr>
<tr><td>④</td><td rowspan="2">Normally open</td></tr>
<tr><td>⑤</td></tr>
<tr><td rowspan="2">Programmable relay output</td><td>⑥</td><td rowspan="2">Normally open</td><td rowspan="2">Programmable output terminal</td><td rowspan="2">*For online soft starters, this function controls the internal cooling fan, with a parameter value of 6. Do not modify this value.
0 - Invalid 1 - Power-on valid 2 - Standby
3 - Starting process valid 4 - Start completed
5 - Soft stop valid 6 - Start to stop valid
7 - Fault valid
Effective contact capacity AC: 5A/250V or 2A/380V DC: 5A/30V</td></tr>
<tr><td>⑦</td></tr>
</table>

★ Indicates two wiring methods for external start-stop signals. When using two-wire control, do not connect terminal ⑨;



LL Control Terminal Wire 0.75-1.25mm^2
Figure 4-3a



K closed for start and run, open for stop
Figure 4-3b

5. Soft Starter Control Modes

5.1 Startup Modes

The soft starter offers four startup modes, and users can choose based on their load conditions.

⊙ Voltage Ramp Startup ⊙ Current Limiting Startup ⊙ Step Voltage Ramp Startup ⊙ Jogging

5.1.1 Voltage Ramp Startup

After initiation, the soft starter outputs voltage that rapidly rises to the "initial voltage of the ramp start" value U1. It then progressively increases the output voltage based on the "voltage ramp startup time" until the startup is complete, as shown in Figure 5-1.

The voltage ramp startup mode is suitable for large inertial loads or situations where the starting current demands are not stringent but a smooth start is desired. This startup method significantly reduces startup impact and mechanical stress. The larger the initial voltage U1 value, the greater the initial torque during startup. However, this also increases the momentary impact during startup. The duration of startup and the set startup time are dependent on the load's weight, unrelated to the current limiting factor.

⊙ Parameters related to the "voltage ramp startup" are as follows:

Initial voltage of ramp startup (U1): 0%-60%

Voltage ramp startup time (t): 1~120s

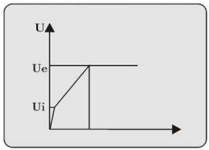


Figure 5-1

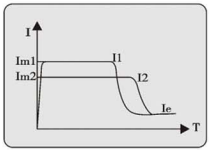


Figure 5-2

5.1.2 Current Limiting Startup

Upon initiation, the motor current swiftly rises to the set current limit value (hn) and maintains the output current below this value. This gradual acceleration of the motor causes the voltage to increase. As the motor approaches its rated speed, the current rapidly decreases to the rated current (Ie), completing the startup process, as depicted in Figure 5-2.

The current limiting startup mode is generally employed in scenarios where strict requirements exist for the starting current. Particularly in cases of limited grid capacity, where startup capacity needs to be restricted, a current limiting factor can be set based on requirements, typically ranging from 2.5 to 3 times. Setting it too low may result in a failure to start normally. When the current limiting startup is adopted, the startup time is related to the current limiting factor. A higher current limiting factor leads to a shorter startup time and vice versa.

⊙ Parameters related to "Current Limiting Startup":

Current limiting factor for startup (Im): 20%-400%

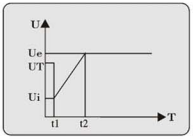


Figure 5-3

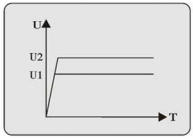


Figure 5-4

5.1.3 Step Voltage Ramp Startup

For certain loads with relatively high static resistance, a substantial torque is needed during the instant of startup. This startup mode can be selected to ensure a successful startup under such circumstances. During startup, the soft starter instantly outputs a high voltage (time can be set), causing the motor to rotate. It then proceeds to start using the voltage ramp startup method until the startup is complete, as shown in Figure 5-3. This startup method is primarily employed for loads with relatively high static resistance.

⊙ Parameters related to "Step Voltage + Voltage Ramp Startup":

Voltage ramp initial voltage (U1): 0%-60%

Voltage ramp startup time (t2): 1~120s

Pulse step voltage (UT): 0%-80%

Pulse step time (t1): (0-500)ms

5.1.4 Jogging

During jogging, the soft starter's output voltage rapidly increases to the initial voltage U1 and remains constant. Changing the set value of U1 allows for adjustment of the output torque of the motor during jogging. This feature is highly convenient for positioning certain loads during testing, as illustrated in Figure 5-4.

⊙ Parameters related to "Jogging":

Jogging voltage: 0%-60%

5.2 Stopping Modes

5.2.1 Freewheeling Stop

Upon receiving a stop command, the soft starter controls the bypass contactor to disconnect. Simultaneously, it blocks the output voltage of the main circuit thyristors, allowing the motor to gradually come to a stop due to inertia.

5.2.2 Soft Stop

In this stopping mode, power supply to the motor shifts from the bypass contactor to the main circuit thyristors. It controls the output voltage to gradually decrease until the motor comes to a steady stop.

Soft stop time: 1s~10s

6.1 Keyboard Control Methods

The soft starter employs a 128x32 dot matrix large screen LCD display module and a micro-switch membrane keypad as its operational display keyboard. It features six micro-switch buttons that facilitate the startup, shutdown, parameter setting, modification, fault querying, and fault resetting of the soft starter. Refer to Figure 6-10 for details.

1. Press the PRG button to enter the parameter group. Press the △ button to switch between parameter groups FO, F1, F2, and F3.
2. For parameter modification, follow these steps: Enter the corresponding parameter group in the first step, press ENTER to access the parameter, use the △ button to modify the parameter value, after modification press ENTER to save the parameter, press PRG to exit, and access parameter group F. To return to the main interface, press PRG again.
3. Press the RUN button to start the soft starter.
4. Press the STOP/Reset button to stop or reset faults.

Figure 6-1

6.2 Keyboard Control Methods

The soft starter features a 128*64 dot matrix large screen LCD display module and a tactile button set with six buttons, allowing for the startup, shutdown, parameter setting, modification, fault querying, and fault resetting of the soft starter.

1. Press the "Settings" key to enter the parameter menu. Use the up and down keys to select parameters, then press the "Settings" key again to enter the parameter modification mode. After making the necessary modifications using the up and down keys, press "Confirm" to complete the parameter modification.
2. Press the "RUN" key to start the soft starter.
3. Press the "Stop/Reset" key to stop and reset.
4. Press the "Stop" key along with the "Confirm" key to access the fault record.
5. Press the "Stop" key along with the up and down keys to restore factory settings.

Figure 6-2

7. Parameter Settings

For detailed parameter settings of the soft starter, refer to (Table 7-1).

S/N	Parameter Number	Name	Setting Range	Factory Value
1	F0.00	Startup Mode	Voltage Ramp Startup; Current Limiting Startup; Step Voltage Ramp Startup; Jogging	Current Limiting Startup
2	F0.01	Stopping Mode	Freewheeling Stop; Soft Stop.	Freewheeling Stop
3	F0.02	Control mode	Keyboard; External Control; Keyboard and External Control; Communication.	Keyboard and External Control
4	F0.03	Voltage Ramp Startup Voltage	0-80%	30%
5	F0.04	Voltage Ramp Startup Time	1-100S	30S
6	F0.05	Limiting Startup Multiplier	50-400%	300%
7	F0.06	Jogging Voltage	0-100%	30%
8	F2.00	Soft Stop Time	0-30S	0S
9	F0.08	Step Voltage	0-100%	0%
10	F0.09	Step Time	0-2000S	0S
11	F0.10	Drive Selection	Bypass Continue Trigger After Bypass Bypass Stop Triggered After Bypass;	Bypass Type: Stop Trigger After Bypass Online Type: Continue Trigger After Bypass
12	F0.11	Programmable Relay Function	Running Effective; Stopping Effective; Bypass Effective; Starting Effective; Fault Effective; Standby Effective;	Running Effective Note: For online soft starters, set to "Running Effective" for fan operation.
13	F0.12	Current Standard Value	5-300%	Adjustment Value
14	F0.13	Voltage Standard Value	5-300%	Adjustment Value

Table 7-1

S/N	Parameter Number	Name	Setting Range	Factory Value
15	F1.00	Startup Overcurrent Multiplier	400-600%	400%
16	F1.01	Running Overcurrent Multiplier	40-400%	200%
17	F1.02	Startup Overload Curve	1-6	4
18	F1.03	Running Overload Curve	1-6	2
19	F1.04	Current Imbalance	5-150%	60%
20	F1.05	Overvoltage Value	380-470V	450V
21	F1.06	Undervoltage Value	240-370V	280Y
22	F2.00	Soft Starter Rated Current	Set Value	Rated Value
23	F2.01	Motor Rated Current	Set Value	
24	F2. 02	Slave Address	1-63	1
25	F2.03	Baud Rate	19200 9600 4800 2400 1200	9600
26	F3.00	Fault 1		
27	F3.01	Fault 2		
28	F3.02	Fault 3		

Table 7-1

8. Troubleshooting and Solutions

8.1 Fault Display and Troubleshooting

S/N	Fault Display	Fault Reason	Troubleshooting
1	Phase Loss at Power-up	Is there a phase loss in the incoming power supply?	This fault cannot be reset. After power-off, check the three-phase power supply and isolation circuit breaker.
2	Phase Loss during Operation	Is there a phase loss in the power supply during operation? Is the thyristor open-circuit?	Check if there is a phase loss in the input power supply. Check the thyristor or triggering circuit.
3	Startup Overcurrent	Limiting mode: Is the current limiting factor suitable? Ramp mode: Is the startup time suitable?	Adjust the aforementioned parameters appropriately. Initial voltage is too high
4	Running Overcurrent	Sudden load increase? Or excessive fluctuations? Load-induced voltage drop?	Adjust the load and check the grid voltage. Adjust the current protection value appropriately.
5	Startup Overload	Excessive load during startup?	Check if the load can be appropriately reduced. Check the overload curve or adjust it accordingly.
6	Running Overload	Motor operating in an overloaded condition? Incorrect feedback (displayed current differs from actual)?	Adjust the load to within the rated value. Calibrate the keyboard current value to match the actual value. Check if the overload curve is acceptable.
7	Current Imbalance	Poor contact of the thyristor triggering socket? Is the thyristor open-circuit? Three-phase current imbalance?	Check the triggering signal or thyristor. Address the power source imbalance condition.
8	Overheat Protection	Frequent startups? Cooling fan not working? Bypass contactor burned out?	Reduce the startup frequency. Check the cooling fan. Check and replace the bypass contactor.
9	EPROM Parameter Error	Parameter out of range? Internal storage failure?	After shutdown, check and reset various setting parameters.
10	Communication Interruption	Communication transmission fault (does not affect operation)	Check the communication transmission system.

Table 8-1

8.2 Overload Protection Levels and Selection

The soft starter has electronic overload protection during the startup and operation processes, featuring inverse time characteristics and divided into 6 levels. The higher the level, the stricter the protection. In other words, for the same overload multiplier, a higher protection level leads to a shorter protection response time. The startup and running overload protection for this product are preset at the factory:

Startup overload protection level factory value: Level 4

Running overload protection level factory value: Level 2

During use, users can adjust these levels based on specific load requirements.

Motor overload protection characteristic level (time for hot recovery to cold state is 180 seconds)

Table 8-2

Overload Multiplier / Overload Level	6Ie	5Ie	4Ie	3Ie	2Ie	1.5Ie	1.2Ie	1.05Ie
1	IS	3S	6S	8S	10S	15S	150S	3600S
2	3S	8S	12S	16S	20S	30S	300	3600S
3	6S	15S	22S	30S	40S	60S	350S	3600S
4	10S	22S	35S	48S	90S	90S	400S	3600S
5	15S	35S	55S	75S	90S	120S	450S	3600S
6	20S	45S	70S	95S	120S	150S	500S	3600S

Motor Overload Protection Characteristic Curve

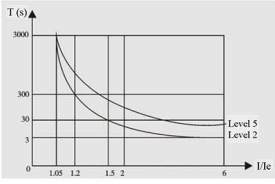


Table 8-1

9. Communications Function

The soft starter's MODBUS protocol communication data format is in RTU (Remote Terminal Unit) mode. In RTU mode, each byte is represented by 8 bits in binary code, and can be expressed using two hexadecimal characters. Hexadecimal characters are: 09, A, B, C, D, E, F.

Standard structure of RTU frame:

Start Header (START)	T1-T2-T3-T4 (3.5 bytes transmission time)
Slave Address (ADDR)	Communication Address: 1 to 63 (decimal), 0 for broadcast address
Function Code (CMD)	03H: Read slave parameters; 06H: Write slave parameters
Data	Data comprising of 2*N bytes
CRC Check Low Byte	CRC Check Value
CRC Check High Byte	
End of Frame (END)	T1-T2-T3-T4 (3.5 bytes transmission time)

9.1 Command Codes and Communication Data Description

⊙ Command 03H (0000 0011b): Read N words (2N bytes)

RTU Master Command Information:

Start, 3.5 bytes time	T1-T2-T3-T4
Slave Address (ADDR)	Slave Address Number
Function Code (CMD)	03H
Data Area	Starting Address Number of Data
CRC	CRC Check
End, 3.5 bytes time	T1-T2-T3-T4

-- Slave Address: The master must recognize the selected slave, and unmatched addresses will only receive the message but won't respond to the master. Byte: 1

-- Function Code: The function code for read command is 03H. Byte: 1

-- Data Area:

-- Starting Address: Starting address of internal memory in the soft starter from which data is to be read. Byte: 2

-- Number of Data: Number of data to be read. Byte: 2

-- CRC Check: Bytes: 2

Response frame format when Slave receives correctly

Start, 3.5 bytes time	T1-T2-T3-T4
Slave Address (ADDR)	Slave Address Number
Function Code (CMD)	03H
Data Area	Number of Bytes Data Value
CRC	CRC Check
End, 3.5 bytes time	T1-T2-T3-T4

-- Slave Address: The responding slave address matches the one requested by the master. Byte: 1

-- Function Code: The function code for read command is 03H. Byte: 1

-- Data Area:

-- Number of Bytes: The quantity of data bytes returned by the read command. Byte: 1

-- Data Value: The data values returned by the read command.

-- CRC Check: Bytes: 2

Response frame format when Slave receives an error:

Start, 3.5 bytes time	T1-T2-T3-T4
Slave Address (ADDR)	Slave Address Number
Function Code (CMD)	83H
Error Code	
Exception Code	
CRC	CRC Check
End, 3.5 bytes time	T1-T2-T3-T4

-- Slave Address: The responding slave address matches the one requested by the master. Byte: 1

-- Error Code: 83H, indicating an error message received by the slave. Byte: 1

-- Exception Code: Indicates the error message. Byte: 1

01H: Non-existent function code;

02H: Illegal starting address or unsupported "starting address + data count";

03H: Unsupported data count;

-- CRC Check: Bytes: 2

⊙ Command Code 10H (0001 0000b): Read N words (2N bytes)

RTU Master Command Information:

Start, 3.5 bytes time	T1-T2-T3-T4
Slave Address (ADDR)	Slave Address Number
Function Code (CMD)	10H
Data Area	Starting Address
	Data Quantity
	Number of Bytes
	Data Value
CRC	CRC Check
End, 3.5 bytes time	T1-T2-T3-T4

-- Slave Address: The master must recognize the selected slave, and unmatched addresses will only receive the message but won't respond to the master. Byte: 1

-- Function Code: The function code for read command is 10H. Byte: 1

-- Data Area:

-- Starting Address: The starting address in the internal memory of the soft starter where the data to be written is located. Byte: 2

-- Data Quantity: The number of data to be written. Byte: 2

-- Number of Bytes: The number of bytes for the data to be written. Byte: 1

-- Data Value: The data value to be written. Byte: 2

-- CRC Check: Bytes: 2

Response frame format when Slave receives correctly:

Start, 3.5 bytes time	T1-T2-T3-T4
Slave Address (ADDR)	Slave Address Number
Function Code (CMD)	10H
Data Area	Starting Address
	Data Quantity
CRC	CRC Check
End, 3.5 bytes time	T1-T2-T3-T4

-- Slave Address: The responding slave address matches the one requested by the master. Byte: 1

-- Function Code: The function code for writing is 10H. Byte: 1

-- Data Area:

-- Starting Address: Starting address for the data already written. Bytes: 2

-- Data Quantity: The number of data already written.

-- CRC Check: Bytes: 2

Response frame format when Slave receives an error:

Start, 3.5 bytes time	T1-T2-T3-T4
Slave Address (ADDR)	Slave Address Number
Error Code	90H
Exception Code	
CRC	CRC Check
End, 3.5 bytes time	T1-T2-T3-T4

-- Slave Address: The responding slave address matches the one requested by the master. Byte: 1

-- Error Code: 90H, indicating an error message received by the slave. Byte: 1.

-- Exception Code: Indicates the error message. Byte: 1

01H: Non-existent function code;

02H: Illegal starting address or unsupported "starting address + data count";

03H: Unsupported data count;

-- CRC Check: Bytes: 2

9.2 Communication Data Address Definition

Address	Name	Read/Write
1000	Control mode	R/W
1001	Startup Mode	R/W
1002	Stopping Mode	R/W
1003	Power of the Soft Starter	R
1004	Rated Power of the Motor	R/W
1008	Jogging Voltage	R/W
1005	Current Limiting Starting Multiplier	R/W
1006	Ramp Startup Voltage	R/W
1007	Voltage Ramp Startup Time	R/W

Address	Name	Read/Write
1009	Step Voltage	R/W
100a	Step Time	R/W
100b	Current Ramp Limit Current	R/W
100c	Current Ramp Startup Time	R/W
100d	Soft Stop Time	R/W
100e	Drive Selection	R/W
1019	Programmable Output Function	R/W
100f	Current Calibration Value	R/W
1010	Voltage Calibration Value	R/W
1011	Startup Overcurrent Multiplier	R/W
1012	Running Overcurrent Multiplier	R/W
1013	Startup Overload Curve	R/W
1014	Run Overload Two Lines	R/W
1015	Current Imbalance	R/W
1017	Overvoltage Value	R/W
1018	Undervoltage Value	R/W
101a	Slave Address	R/W
101b	Baud Rate	R/W
1027	I Control Command	W
1029	Soft Starter Status	W
102a	Three-Phase Average Current	R
102e	Voltage Value	R
1033	First Fault	R
1034	Second Fault	R
1035	Third Fault	R

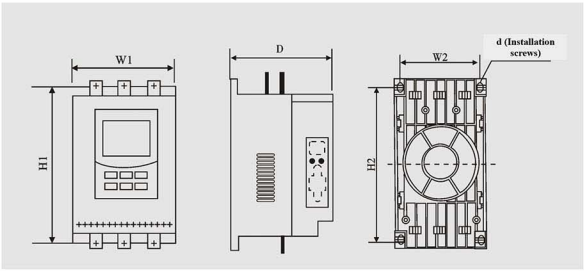
★ Note:

● Address 0x1027: Control command, bit7: Stop position. Bit6: Start position. Bit5: Fault reset. Others are undefined. "1" means effective; "0" means ineffective.

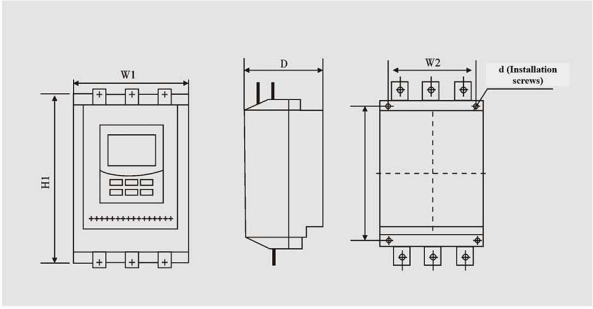
● Address 0x1029: Soft starter status.0 - Standby; 1 - Start; 2 - Bypass; 3 - Stop; 4 - Edit; 5 - Fault.

10. Bypass Type Intelligent Soft Starter Structure and External Dimensions

① 5.5kW~75kW (Figure 10.1)



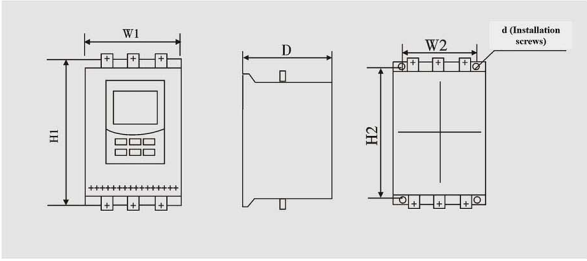
② 75kW-630kW (Figure 10.2)



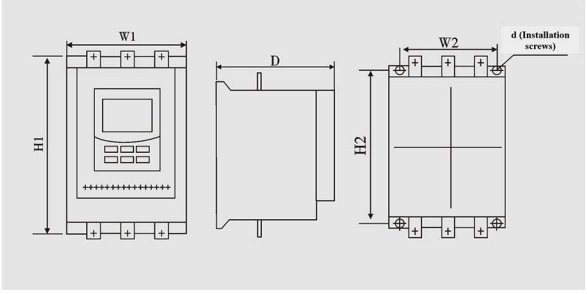
Model	External Dimensions (mm)			Installation Dimensions (mm)			External Diagram
	H1	W1	D	H2	W2	d	
18.5～75kW	295	146	160	250	130	M6	Figure 10.1
75～220kW	510	260	200	370	195	M8	Figure 10.2
250～400kW	560	290	240	460	260	M8	Figure 10.2
450～500kW	590	330	240	500	295	M8	Figure 10.2

11. Structure and External Dimensions of Online Type Intelligent Soft Starter

① 5.5kW~45kW (Figure 11.1)



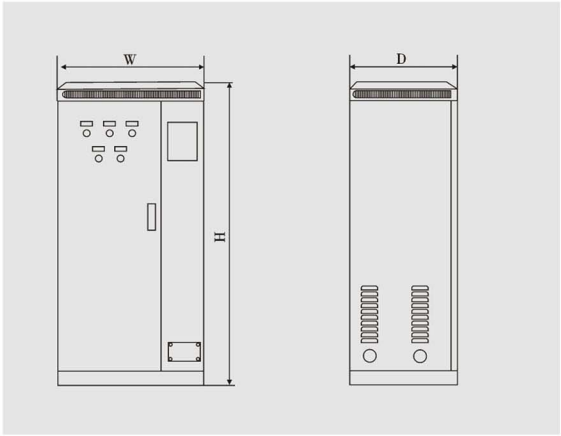
② 55kW-630kW (Figure 11.2)



Model	External Dimensions (mm)			Installation Dimensions (mm)			External Diagram
	H1	W1	D	H2	W2	d	
11～45kW	300	145	195	278	85	M6	Figure 11.1
55～90kW	345	210	260	325	165	M8	Figure 11.2
115～220kW	510	380	245	435	320	M8	Figure 11.2
250～400kW	610	430	260	510	375	M8	Figure 11.2
450～720kW	770	620	330	660	555	M8	Figure 11.2

12. Structure and Dimensions of Intelligent Online Soft Starter Cabinet

① Front View ② Side View



Model	External Dimensions (mm)		
	H	W	D
18.5～90kW	1000	420	380
115~250kW	1250	600	450
285～400kW	1550	700	500
450～630kW	1750	700	500

As time progresses and technology advances continuously, any changes will not be separately notified. In case of any discrepancies between the product images and the actual product, please refer to the actual product. The company reserves the right to modify the information and the final interpretation.

Cherish resources, care for the environment.