



西安西驰电气股份有限公司
XI AN SPREAD ELEC TRIC COMPANY LIMITED



User's Manual For CMC-MX Soft Starter

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Safety Precautions

The main circuit power will have dangerous voltage when it gets power supply.

The input terminals (1L1, 3L2, 5L3) can not be connected with output terminals (2T1, 4T2, 6T3).

The soft starter's output terminals (2T1, 4T2, 6T3) can not be connected with compensation capacitor or sensitive resistance.

When soft starter and frequency inverter are standby mutually, the output end has to be isolated from each other.

Do not attempt to repair the damaged device, please contact supplier directly.

The temperature of the heat sink may be higher.

Do not supply reverse power on the output end of soft starter.

The high voltage always exists on the output side when starting or stopping soft starter.



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Foreword

Thank you for using CMC-MX motor soft starter that produced by Xi'an Spread Electric Co., Ltd. In order to exhibit soft starter function sufficiently, please operate it correctly according to the procedures and ensure the operators' safety. Please read this user's manual before you use it. When you meet difficult problems that can not find in this manual, please contact Spread Electric Co., Ltd or local dealer. We will be happy to serve you.

Chapter 1. Functions and Features of CMC-MX Soft Starter

1.1 Functions

CMC-MX motor soft starter is a kind of new motor starter and protection devices which combines power electronics technology, microprocessor and automatic control. It can start / stop motor smoothly, which avoids issues of shocks between mechanical and electrical caused by direct starting, star / delta starting, auto decompression starting and other traditional start mode. It can also effectively reduce the starting current and distribution capacity, to avoid capacity investment. Meanwhile, current transformers and contactors are integrated in CMC-MX soft starter, users do not need to connect them externally.

1.2 Features

★Various start-up mode

User can select current-limit starting mode or voltage ramp starting mode. In order to meet site requirements in maximum extent and to achieve the best start effect, you can also impose a programmable jump starting and starting current-limit under each mode.

★High reliability

High-performance microprocessor makes digital processing on control system, it avoids excessive adjustment on analog lines and achieves excellent accuracy and speed of execution.

★Strong anti-jamming performance

All external control signals use Photoelectric isolation and set a different anti-noise level. It fits for special industrial environment application..

★Easy adjustment method

With wide application range of control system, easy and intuitive adjustment. Through a variety of function options to match different types of control object.

★Optimized structure

Unique compact design of internal structure, particularly user-friendly make it integrated into existing system. It saves costs of current transformer and bypass contactor costs for users.

★Adaptive power frequency

Power frequency 50/60 Hz, adaptive function, user-friendly.

★Analog output

4-20mA current output function, user-friendly

★MODBUS-RTU Communication



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During network communications, it can connect up to 32 devices. Users can achieve the purpose of automatic communication by setting baud rate, communication address. The setting range of communication address is 1-32, The factory value is 1. The setting range of communication address is 0,2400; 1,4800; 2,9600; 3,19200. The factory value is 2 (9600).

★Improved protection function

A variety of motor protection functions (Such as over-current, input/output default phase, thyristor short circuit, overheat protection, leakage detection, electronic thermal overload, internal contactor fault, phase current imbalance, etc.) ensures that motor and soft starter will not be damaged in case of failure or malfunction.

★Easy to maintain

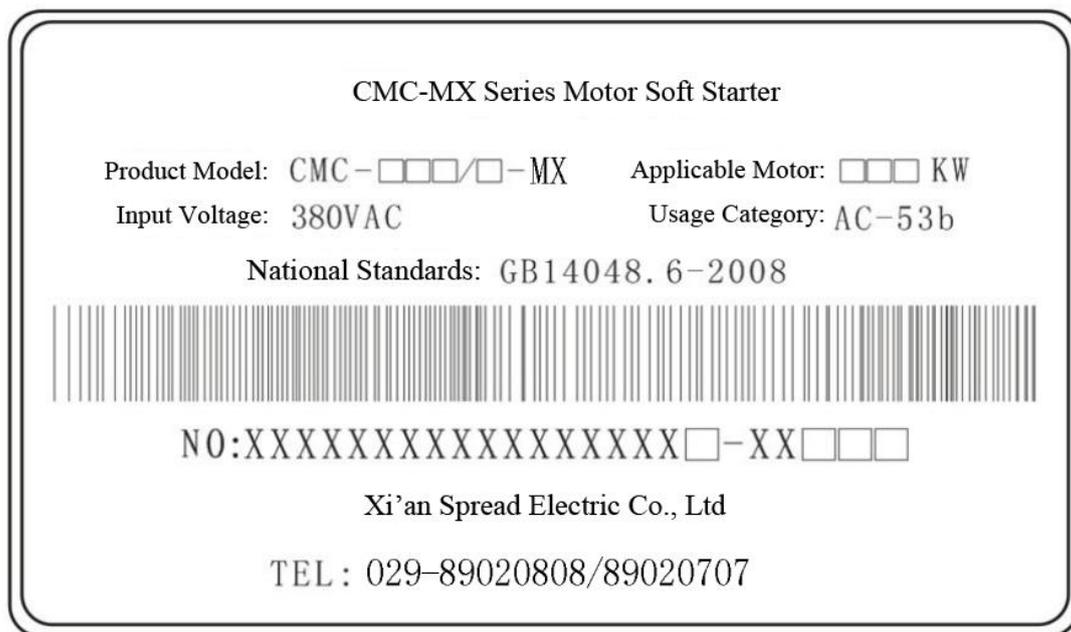
Monitoring signal coding system consists of four digital display, which monitors system equipment's working conditions, while providing rapid fault diagnosis.

Chapter 2. Receiving checking

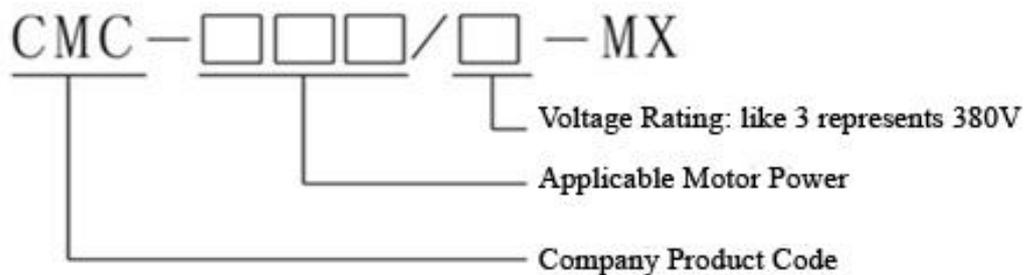
Each soft starter have been fully functional and operational tests in the factory, Please check as the following steps after getting and unpacking device. If there is any problem, please contact the supplier immediately.

1. Check the nameplate to confirm the products are whether you order.

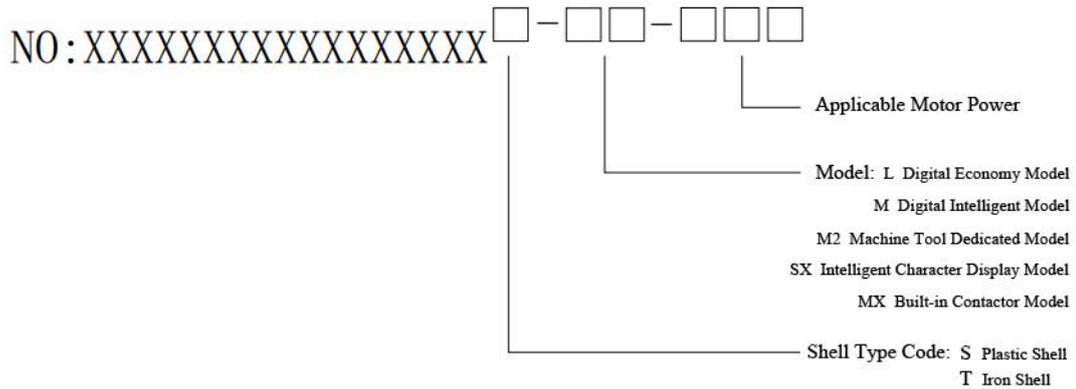
(1) Soft starter nameplate description



(2) Soft starter model description



(3)Soft starter item number description



2. Check the product for any damage in transit, such as housing depression, deformation, internal wiring, connectors loosening.
3. Check whether it has product certification, warranty card, packing list, product manual and so on.
4. Once product out of factory, its guarantee keeps in accordance with the warranty. Please carefully fill in the warranty card, and send it to Xi'an Spread Electric Co., Ltd or local suppliers.



Chapter 3. Usage conditions and installation

3.1 Conditions of usage

Control Power	AC110V--220V±15%, 50/60Hz
Three-Phase Power	AC380V, 660V±30%
Nominal Current	15A--110A
Applicable Motor	General squirrel cage AC asynchronous motor
Start Ramp Mode	Current limit soft start, voltage ramp start
Stop Mode	Free stop, soft stop
Logic Input	Impedance 1.8KΩ, power + 15V
Starting Frequency	Do frequent or infrequent start, we recommend starting no more than 10 times per hour
Protection Function	Phase failure, over-current, short circuit, SCR protection, overheating, under load, phase current unbalance, wiring, internal fault, etc.
Protection Level	IP00、IP20
Cooling Mode	Natural cooling or forced air cooling
Installation Method	Wall-mounted
Environmental Conditions	Altitude more than 2000 meters, capacity utilization should be reduced accordingly. Ambient temperature is between -25 to 45 °C Corresponding humidity less than 95% (20°C±5°C) No flammable, explosive, corrosive gas. No conductive dust, indoor installation, well ventilation, vibration less than 0.5G.

3.2 Installation Direction

The soft starter should be mounted vertically, in order to ensure good ventilation and cooling conditions.

3.3 Installation Space

Leave enough space for heating dissipation around the device and keep a distance between device and the wall for easy maintenance (See Schedule 3). If need to select fans, please download the fans' sizes from our website (www.xichi.cn)

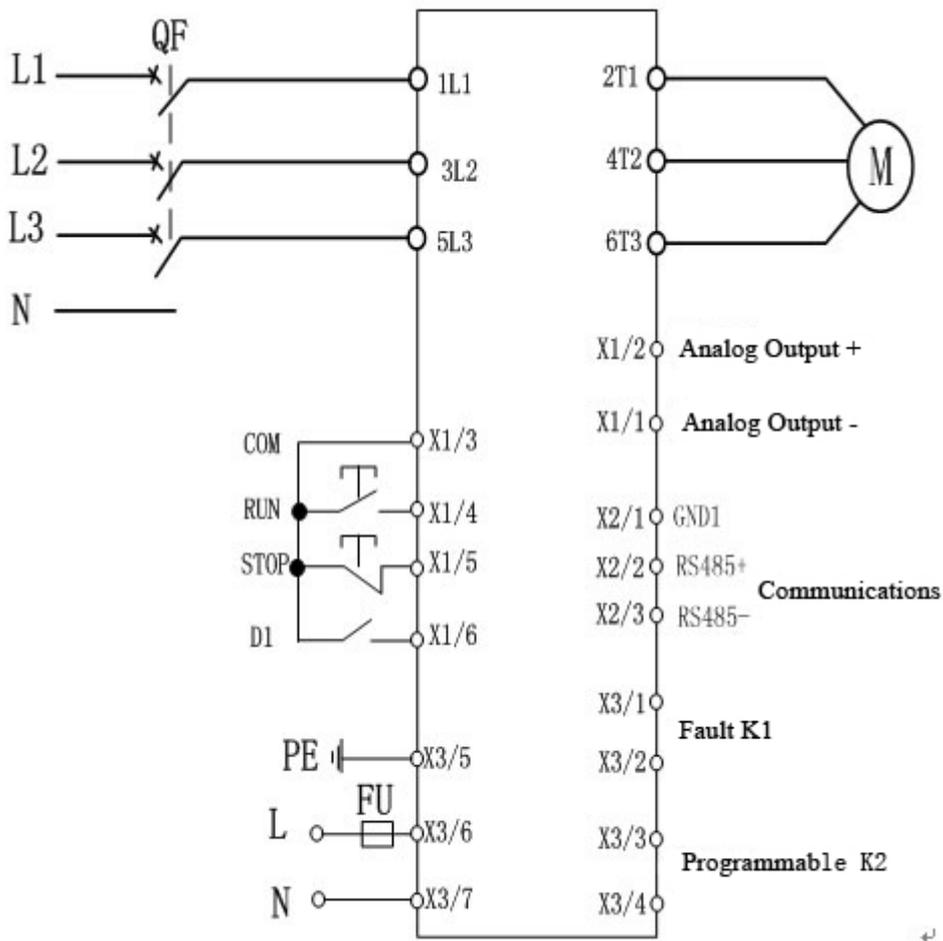
3.4 Circuit Installation

The main circuit should be upper lower, cable should ensure adequate ampacity. Peripheral accessories election, please refer to Schedule 1.

Chapter 4. Circuit Connection

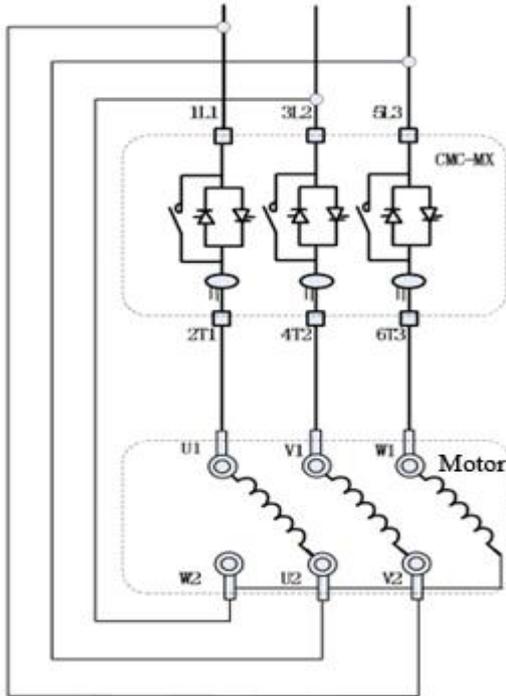
4.1 Basic Wiring Diagram

Soft starter terminal 1L1, 3L2, 5L3 connect to three-phase power. Terminal 2T1, 4T2, 6T3 connect to motor. No need to connect external bypass contactors, soft starters can choose whether detect phase sequence or not by setting parameter.



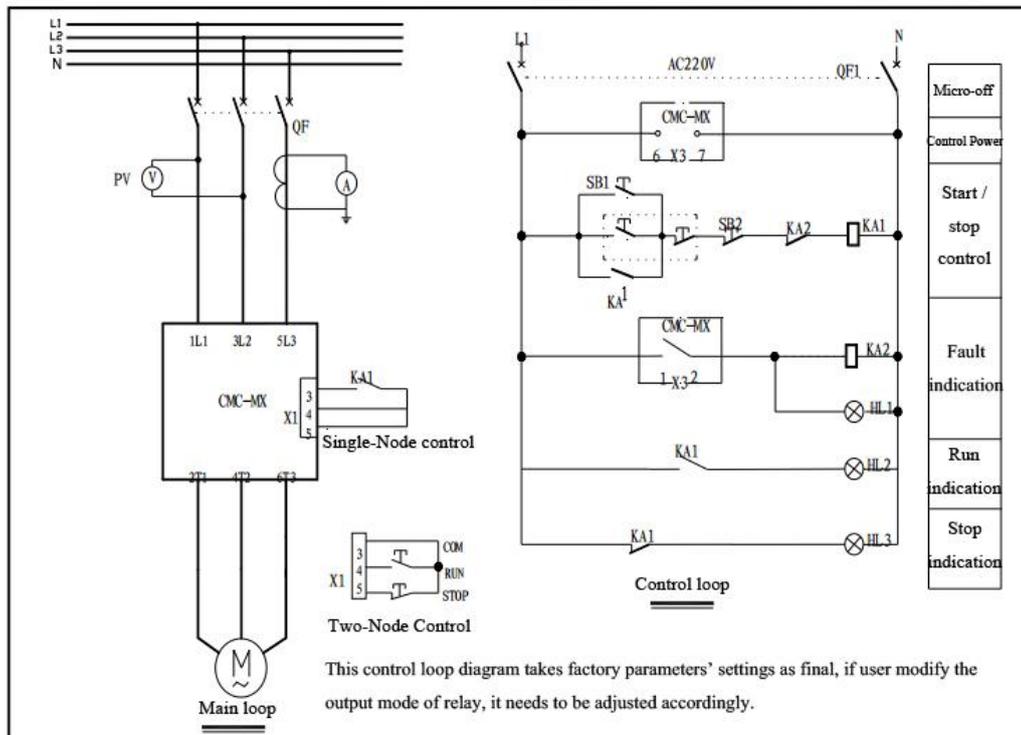
4.2 Inside delta connection diagram

If adopt connect by inside delta connection, users must connect strictly accordance with the following figure. If not, the motor or soft starter may be damaged. The machine will judge the motor wiring before starting motor, if the wiring errors, the soft starter will reported failures.



Inside delta connection

4.3 Typical application wiring diagram



Note:

The single node control is showed in the figure. Node closed, soft starter starts, node open, soft starter stops. But pay attention to wiring to LED panel start-up operation is invalid. 3, 4, 5 terminal start-up signal is a passive node.

PE grounding wire should be as short as possible, connected to the nearest ground away from the soft starter, proper grounding point should be located in mounting plate closed to the soft starter. Mounting plate should also be grounded for functional rather than protective.

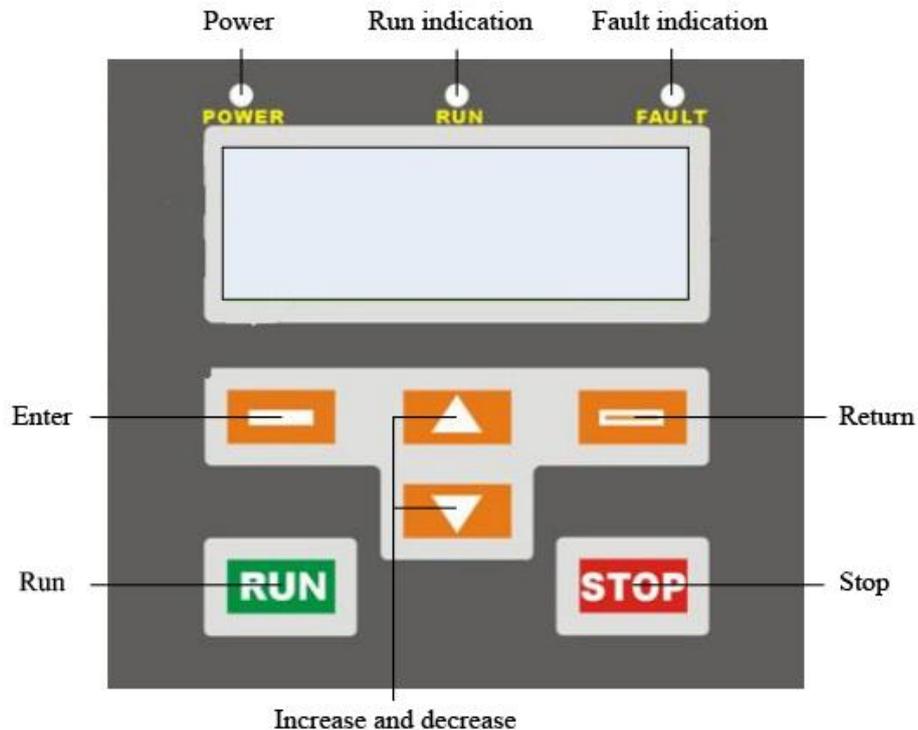
4.4 Terminal Description

CMC-MX series soft starters have 17 introduced control terminals for users to achieve an external signal control, remote control and system control conveniently.

Terminal No.	Terminal Name	Description	
Main loop	1L1, 3L2, 5L3	AC power input terminals	
	2T1, 4T2, 6T3	Soft start output terminals	
Control loop	X1/1	Analog Output -	
	X1/2	Analog Output +	
	X1/3	COM	
	X1/4	External control start terminal (RUN)	
	X1/5	External control stop terminal (STOP)	
	X1/6	Programmable digital input	
	X2/1	GND1	
	X2/2	RS485+	
	X2/3	RS485-	
	X2/4	Empty	
	X3/1	Fault output relay K1	When the output is active, K11-K12 closed, contact capacity is AC250V /5A, DC30V / 5A
	X3/2		
	X3/3	Programmable output relay K2	When the output is active, K11-K12 closed, contact capacity is AC250V/5A, DC30V/5A
	X3/4		
	X3/5	PE	PE
X3/6	Control power (220VAC)	AC110V--AC220V±15% 50/60Hz	
X3/7			

Chapter 5 Display and Operating Instructions

5.1 Panel Diagram



The average current are displayed on the LED panel when in start-up process, the total pressure, soft stop process. There are three LED lights on the panel. LED1 marks POWER, motherboard voltage light steady in normal situation; LED2 marks RUN, it is flashing in the process of starting and stopping, and will be light steady after completing starting. LED3 marks FAULT, it lights when in fault.

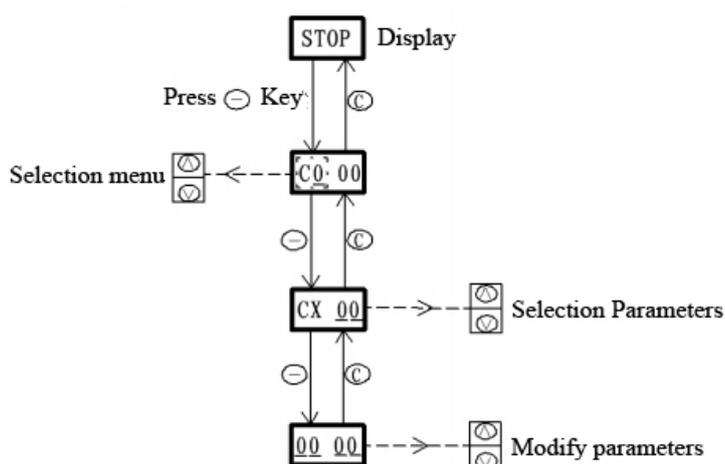
5.2 Key Function Description

Symbol	Name	Function Description
	Enter key	Enter the menu items, confirm the parameter item you need to modify data.
	Increment key	Incremental operating of parameters items or data (During running, it can calibrate current)
	Decrement key	Dncremental operating of parameters items or data(During running, it can calibrate current)
	Return key	Confirm modified parameter data, exit the parameter item, exit the parameter menu
	Start key	When key operation is valid, it is used for running operation, and terminal 3, 5 of X1 short connect
	Stop key	When key operation, it is used for operation,under fault, press STOP key for over 3 seconds, it can reset the current fault.

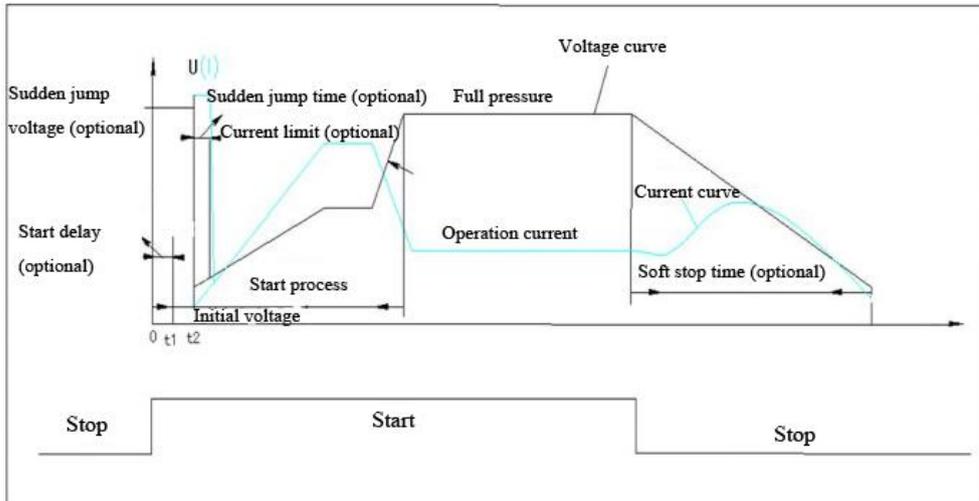
5.3 Display Status Description

No.	Display symbols	Status Description	Description
1		Stop state	The device in a stopped state
2		Programming state	can view and set parameters
3		Start the countdown status	The device is starting the countdown status
4		Fault Status	Device in a fault state

5.4 Modify Parameter Operating Procedures



Chapter 6. Soft Starter Control Mode

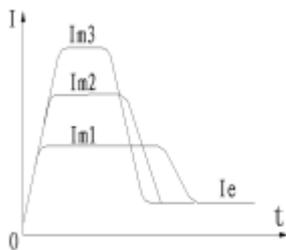


Soft starter/soft stop voltage (Current) characteristic curve

CMC-MX soft starter has many start-up mode: limit current start, voltage ramp start; Many stop mode: free parking, soft stop. Users can choose different ways of starting and stopping methods according to different starting and stopping methods.

6.1 Current Limit Soft Start

When using current limit starting mode, after getting a start command, the output voltage increases rapidly until the output current reaches the amplitude value of setting current limit I_m , the output current no longer increases, after the motor spin up for a while, the current starts to fall, output voltage is rapidly increased until full voltage output, the starting process is completed.

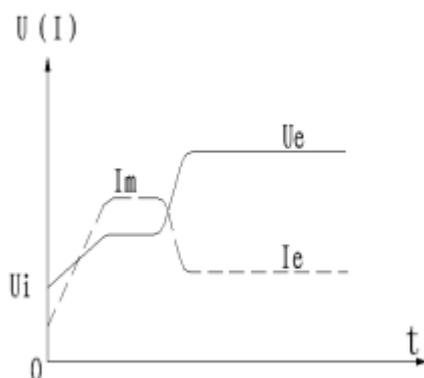


Parameters	Name	Range	Set value	Default value
C000	Start Mode	0-1	1	0
C004	Ramp time	0-60S	0	10
C005	Current limit multiples	100-500%I _e	---	350%

Note: “---” indicates that the user sets in accordance with demand.

6.2 Voltage Ramp Start

This start-up mode fits for large inertia loads, while for occasions which have high requirement of smooth start, it can greatly reduce the starting shock and mechanical stress.



6.3 Sudden jump torque soft start

Sudden jump torque soft start is mainly used in load motors which have larger static resistance, it applies an instantaneous large starting torque to overcome the large static friction torque. In this mode, the output voltage quickly reach the setting sudden jump voltage, when reaches the preset jump time, according to the set given starting voltage, ramp time, it starts smoothly, until the start is completed.

Parameters	Name	Range	Set value	Default value
C000	Start Mode	0---1	0	0
C003	Initial voltage	25-100%Ue	---	30%
C004	Ramp time	0-60S	---	10
C005	Current limit multiples	100-500%Ie	---	350%



It have to be in conjunction with other soft start mode when using the sudden jump torque start mode, and it has to set sudden jump voltage and sudden jump time value.

6.4 Freewheel Stop

When soft stop time (C007) is set to zero, it is freewheel mode, once the soft start gets the stop command, the soft starter blockade bypass contactor control relay and then block the output of the main circuit thyristor tube, motor coasts to stop according to the load inertia.



Parameters	Name	Range	Set value	Default value
C007	Soft stop time	0-60S	0	0

6.5 Soft Stop

When the soft stop time setting is not zero, soft stop is stop as full pressure state, in this stop mode, soft starter disconnects bypass contactor firstly, the output voltage will gradually reduce to a soft stop termination voltage value within a given set time of soft stop, once soft stop process ends, starter switches to freewheel.

Parameters	Name	Range	Set value	Default value
C007	Soft stop time	0-60S	10	0
C009	Termination voltage	25---60%	25	25

Chapter 7. Parameter and Description

CMC-MX soft starter parameters can be divided into three categories according to their functions: start-stop control parameter C0, protection parameters C1, prot setup parameters C2, recording parameters C3.

7.1 Start-stop Control Parameter Menu C000-C016 A total of 17 Parameters

Parameters	Name	Range	Set value
C000	Start Mode	0. Voltage ramp 1. Current limit	0
C001	Sudden jump voltage	20%--100%Ue	20%
C002	Sudden jump time	0-200*10mS	0
C003	Initial voltage	25%--100%Ue	30%
C004	Ramp time	0---60S	10
C005	Current limit multiples	100%--500%Ie	350%
C006	Second starter allowed	0---60S	0
C007	Stop time	0---60S	0
C008	Soft stop termination voltage	25---60%	0.25
C009	Start delay	0-250S	0
C010	Second current limit multiples	100%--500%Ie	0.4
C011-C116	Undefined parameters		

7.2 Motor Protection Parameters Menu C100-C116 A total of 17 Parameters

Parameters	Name	Range	Set value
C100	Motor rated current	15.0-9999A	----
C101	Overcurrent protection	(100-500)%Ie When 100, closed	150%
C102	Electronic thermal overload	10A, 10, 15, 20, 25, 30, OFF	20
C103	Phase sequence detection	0.Detect 1.Not detected	1
C104	SCR protection selection	0-SCR Protection 1-SCR Protection prohibited	0
C105	Starting time limit	0---120S	80
C106	Overcurrent duration	1--60S	1
C107	Phase current unbalance	10-100%	70
C108-C116	Undefined parameters		



7.3 Port Set Parameters C200-C216 A total of 17 Parameters

Parameters	Name	Range	Set value
C200	Control options	0. Keyboard control 1. Communication control 2. Keyboard and communication control	0
C201	Undefined		
C202	D1 port input mode	0. Failure clear input 1. Emergency stop input	0
C203	Undefined		
C204	Relay output mode	0. Full pressure output 1. Start process output 2. Soft stop process output 3. Fault output	1
C205	Relay output delay	0-250S	0
C206	Undefined		-----
C207	Undefined		-----
C208	Analog output	0. Average current 1 (0---200Ie)% 1. Average current 2 (0---400Ie)%	0
C209	Communication address	1---32	1
C210	Communication baud rate	0. 2400 1. 4800 2. 9600 3. 19200	2
C211	Frequency protection settings	0. 50Hz 1. 60Hz	0
C212	Motor wiring set	0. Adaptive 1. External 2. Inscribed	0
C213-C216	Undefined parameters		

7.4 Record Function Parameters C300-C316 A total of 17 Parameters

Parameters	Name	Range	Set value
C300	Soft start rated current	----	----
C301	Software Version	----	----
C302	Current display accuracy	----	----
C303	Current correction	----	----
C304	Users start times	----	----
C305	Manufacturer's parameter	----	----
C306	Manufacturer's parameter	----	----
C307	Current output correction	----	----
C308-C316	Undefined parameters		

7.5 Function description

Start-stop control parameter C0 (Sart control mode description refers to Chapter 6)

Users can select the starting curve through parameter C000, making the starting curve and the actual load match together for achieving the best starting effects. If you set up sudden jump voltage and sudden jump time, before starting it will impose a transient large starting torque, and then starts according to the set start voltage and ramp time. When the value of parameter C006 is not zero, if starting is not completed after it reaches the set time, the soft starter will start for the second time according to initial voltage and ramp time. During the starting, starting current is limited to the value set by parameter C005, the second starting current is limited to the value set by parameter C010.

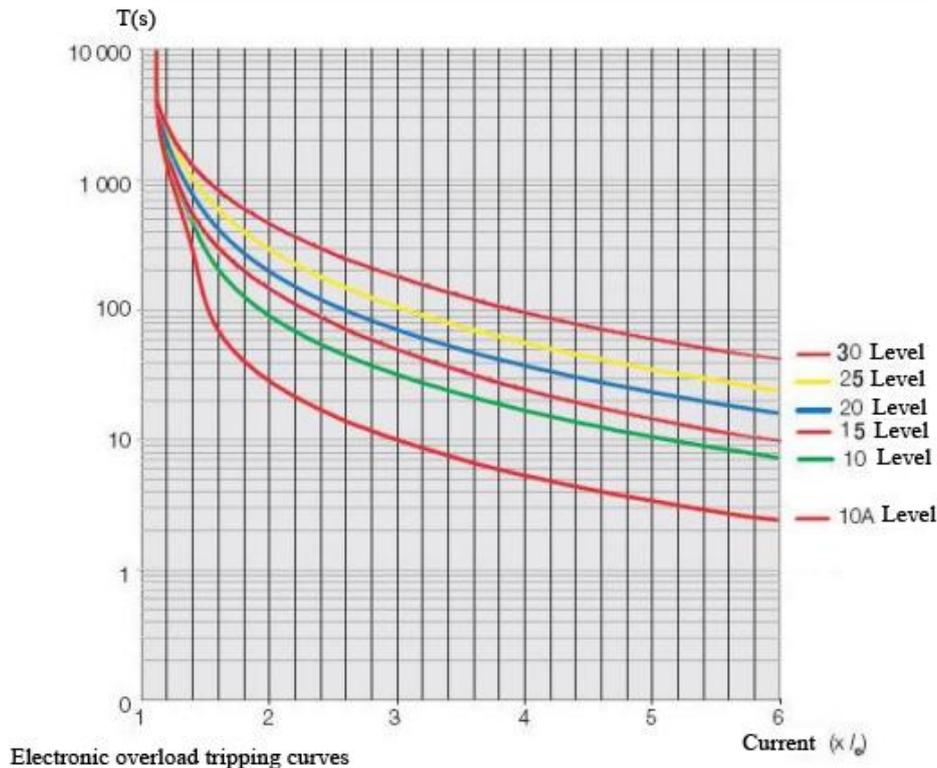
Note: When starting mode is selected for voltage ramp start, the corresponding parameter C003 represents the starting voltage;

The length of parameter C004 ramp time can decide within when to increase start torque to final torque. When the ramp time is longer, it will produce a smaller acceleration torque in the motor starting process. This would make the motor soft acceleration for longer time. You should select the length of ramp time so that motor can soft acceleration until it reaches its rated speed. When the acceleration time ends before motor acceleration completes, it will be set torque to limit torque within a certain time. So the ramp time represents the rate of speed changes, not exactly the same as motor's starting time.

Protection parameter

User can set rated current by the size of power carried by C100 motor, making soft starter and motor match perfectly for better protection of motor. During operation, current exceeds the over-current protection value which is set by C101 parameter, soft starter will start over-current protection. Once it exceeds the electronic thermal overload class and trip time which is set by C102 parameter, soft starter will start overload protection. Meanwhile, the corresponding fault type will be displayed on the interface for users to find. (Rated motor current not less than 50% of the rated current controller.)

If there is no requirements on power phase sequence, just set parameter C103 to non-inspection phase sequence, otherwise set it to inspection phase sequence. If do not protect SCR in use process, set parameter C104 to 0, otherwise set to 1. If users use phase currents unbalance protection, users can set the parameters C107.



Port set parameters

➤ The operation of soft starter/stop can be selected via the parameter C200. Parameter C009 starts with starting function, if set starting delay, after giving effective start command, once it reaches the delay time set by parameter C009, soft starter starts.

➤ Parameter 202 is used to set the programmable input terminal D1 input type.

Note: 1. When terminal D1 is set to fault clearing, as if the fault is cleared, start command exists, the soft starter starts again.

2. When terminal D1 is set to emergency stop input, in the process of start, stop and full pressure, it can stop running.

➤ Programmable relay: Parameter C204 can be used for output of programmable relay.

Full pressure output: When soft starter's start output reaches the rated voltage, output is closed.

Starting process output: When soft starter in the process of starting, output is closed.

Soft stop process output: When soft starter in the process of soft

stop, output.

Under output fault: When soft starter detects a fault, output is closed.

➤ 4-20mA analog outputs: parameter C208 is used to set the corresponding current value of analog output. User can select 4-20mA correspond to 0-2Ie or 0-4Ie.

➤ Communication function: This machine supports MODBUS-RTU standard communication model, parameter C209 can set communication address, parameter C210 can set baud rate.

For details, you can refer to Chapter 9.

➤ Inside delta function: Parameter C212 set the wiring of motor, when set to zero, the machine can detect the current wiring automatically, when set to 2, it is inner triangle wiring control.

◆ **Recording parameter C3**

This parameter records soft starter's work and status information, user can not modified.



Chapter 8 Fault Detection and Exclusion

8.1 Fault code table

When protection function is activated, soft starter shut down immediately, the display shows the current malfunction. User can analysis failure according to the fault content.

Display	Status Description	Processing method
	Motor starting signal is given, but no response	<ol style="list-style-type: none">1. Check 3 and 5 of X1 whether have been connected2. Check control circuit connections whether are correct, and control switch whether is normal3. Check control power whether is too low4. C200 parameter settings wrongly
No display		<ol style="list-style-type: none">1. Check 6 and 7 of X3 whether have been connected.2. Check control power whether is correct.
	Default phase when motor starts	<ol style="list-style-type: none">1. Check three-phase power and each phase of voltage, to make sure whether it is default phase and excluded
	SCR overheating	<ol style="list-style-type: none">1. Check installation environment of soft starter whether is good, and vertical mounting2. Check radiator whether is too hot or overheat protection switch is turned off3. Start frequency is too high, reduce start frequency4. Control power is too low, the power drop too large in start process.
	Start failure	<ol style="list-style-type: none">1. Check each operating parameter's set value to verify whether it matches actual motor parameters.2. Start failure (Completed within the set time of C105) check whether the current limit multiples is set too low



Err4	Soft starter input and output short circuit	1. Check whether the internal contactor is stuck in the closed position 2. Check whether SCR is breakdown or damage.
	Motor cable open circuit (C104 is set to 0)	1. Check soft starter output and motor whether is correct and reliable. 2. To confirm whether the inside motor is open circuit 3. Check whether SCR is breakdown or damage 4. Check whether the line is fault phase
Err5	Current limit function failure	1. Check the parameter C100 settings whether are correct
	Motor operation overcurrent	1. Check the soft starter output side connecting whether is short circuit 2. Load increase suddenly? 3. Load fluctuates too much?
Err6	Electronic thermal overload	1. Whether operation overload?
Err7	Phase sequence error	1. Check the line phase sequency and parameter setting
Err8	Phase current unbalance	2. Check main circuit current or whether voltage is balanced and parameter C107 settings
Err9	Frequency error	1. Check the main power frequency and parameter C211 setting
Er10	Parameter is missing	1. If it occurs after power on again, please contact the manufacturer
Er11	Wiring error	

8.2 Failure Clearing

Failure has memory, so when trouble is cleared, through key STOP (long press more than 4 seconds) or external clear failure input (D1 functional input) terminal reset, to make soft starter restored to starting ready state.



Chapter 9. Communication and Control

CMC-MX motor soft starters, provide RS485 communication interface, using international standard Modbus protocol for host-slave communication. Users can achieve centralized control to accommodate specific application requirement through PC/PLC or upper computer.

9.1 Contents of agreement

The Modbus serial communication protocol defines the frame content of asynchronous transmission in serial communication and the format of slave machine response frame. The frame content of host machine organization is including: slave machine address, execute commands, data and error checking etc. The response of slave machine also uses the same structure, including: running confirmation, returning data and error checking. If slave machine occurs an error when receiving frame, or can not complete host machine's requested action, it will organize a fault frame as a response back to the host machines.

9.2 Bus structure

Interface mode

RS485 hardware interface

Transmission mode

Asynchronous serial, half-duplex transmission mode. At the same time, only one of host machine and slave machine transmits data and the other receives data. In process of asynchronous serial communication, data is transmitted in the format of message frame by frame.

Topology

Single host multi-slave system. Range of slave address is 1 to 31, Range of each slave machine is unique. This is the basis for Modbus serial communications.

9.3 Protocol Description

CMC-MX soft starter communication protocol is an asynchronous serial host-slave Modbus communication protocol, Only one device can establish protocol in the network. Other devices can only response host machine's "Query/Command" by providing data, or make appropriate action according to host machine's "Query/Command". Host machine here refers to personal computer (PC), industrial control devices or programmable logic controller (PLC) and etc. Slave machine refers to CMC-MX soft starter or other control devices which have the same communication protocol.



9.4 Communication frame structure

CMC-MX soft starter Modbus protocol communication data format is RTU(Remote Terminal Unit) Mode. In RTU mode, each byte's format is as follows:

Coding System: 8-bit binary; hexadecimal 0-9, A-F; Each eight-bit frame domain includes two hexadecimal characters.

In this mode, the new one is always of silence at least 3.5 bytes transmission, as a start. On the network which is calculated transmission rate on the baud rate, the transmission time of 3.5 bytes can easily grasp. Then transfer data as follows: slave machine address, command code, data and CRC check character, each domain's transfer byte is hexadecimal 1...9, A...F. Network device are always monitoring the communication activity of the bus, even in the silent interval. When receiving the first domain (address information), each network device will confirm the bytes. With the completion of the last byte's transmission, another similar section of 3.5 byte transmission time intervals represents the end of the frame, after this, the transfer will start a new frame.

Information of a frame must transmit through a continuous data stream. If the time is over 1.5 bytes' interval time before ending of frame transmission, receiving device will clear these incomplete information.

9.5 Address description



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XI AN SPREAD ELEC TRIC COMPANY LIMITED

Name	Variable type	Register number	Data Type	R / W characteristics
Start mode	I / 0 Integers	0000	Uint	R/W
Sudden jump voltage	I / 0 Integers	0001	Uint	R/W
Sudden jump time	I / 0 Integers	0002	Uint	R/W
Initial voltage	I / 0 Integers	0003	Uint	R/W
Ramp time	I / 0 Integers	0004	Uint	R/W
Current limit multiples	I / 0 Integers	0005	Uint	R/W
Second starter allowed	I / 0 Integers	0006	Uint	R/W
Stop time	I / 0 Integers	0007	Uint	R/W
Soft stop termination voltage	I / 0 Integers	0008	Uint	R/W
Start delay	I / 0 Integers	0009	Uint	R/W
Secondary current limit multiples	I / 0 Integers	0010	Uint	R/W
Motor rated current	I / 0 Integers	0017	Uint	R/W
Overcurrent protection	I / 0 Integers	0018	Uint	R/W
Electronic thermal overload	I / 0 Integers	0019	Uint	R/W
Phase sequence detection	I / 0 Integers	0020	Uint	R/W
SCR protection selection	I / 0 Integers	0021	Uint	R/W
Starting time limit	I / 0 Integers	0022	Uint	R/W
Duration overcurrent	I / 0 Integers	0023	Uint	R/W
Phase current unbalance	I / 0 Integers	0024	Uint	R/W
Control options	I / 0 Integers	0034	Uint	R/W
Undefined parameters	I / 0 Integers	0035	Uint	R/W
D1 input port	I / 0 Integers	0036	Uint	R/W
Undefined parameters	I / 0 Integers	0037	Uint	R/W
Relay output mode	I / 0 Integers	0038	Uint	R/W
Relay output delay	I / 0 Integers	0039	Uint	R/W
Analog output mode	I / 0 Integers	0042	Uint	R/W
Communication address	I / 0 Integers	0043	Uint	R/W
Communication baud rate	I / 0 Integers	0044	Uint	R/W
Frequency protection settings	I / 0 Integers	0045	Uint	R/W
Motor wiring setting	I / 0 Integers	0046	Uint	R/W
Soft starting rated current	I / 0 Integers	0051	Uint	R
Software Version	I / 0 Integers	0052	Uint	R
Current display accuracy	I / 0 Integers	0053	Uint	R
Current correction	I / 0 Integers	0054	Uint	R
Current output correction	I / 0 Integers	0058	Uint	R
Soft starting working status word	I / 0 Integers	0100	Uint	R
Fault code	I / 0 Integers	0101	Uint	R
Motor rated current	I / 0 Integers	0102	Uint	R
Motor average current	I / 0 Integers	0103	Uint	R
Analog output percentage	I / 0 Integers	0104	Uint	R
Soft starting countdown time	I / 0 Integers	0105	Uint	R

Description: Soft starting working status word definition



Value	Description
0X00	Stop status
0X80	Fault status
0X20	Edit status
0X40	Operating status

9.6 Control command parameter address

Name	Variable type	Register number	Data	R / W characteristics
Stop	I / O Integers	0200	0x0081	W
Start	I / O Integers	0202	0x0083	W
Reset	I / O Integers	0203	0x0084	W

Note: If the control command is disabled, please check the C200 parameter, whether open communication and control functions; to check whether terminals X1/3 and X1/5 is short circuited.

9.7 Function code overview

Function code “03” (Read many holding registers)

Host sends data	Number of byte	Routines	The slave returns data	Number of return bytes	Routines
Slave address	1	01	Slave address	1	01
Function code	1	03	Function code	1	03
Initial address	2	006D	Number of return bytes	1	02
Data length	2	0001	Data1	2	4100
CRC	2	15D7	CRC	2	8814

Note: The maximum number of registers can be read is 50 each time.

(2) Function code “06” (write single register)

Send data	Number of byte	Routines	The slave returns data	Number of return bytes	Routines
Slave address	1	01	Slave address	1	01
Function code	1	06	Function code	1	06
Initial address	2	0001	Number of return bytes	2	0001
Write data	2	0001E	Data1	2	001E
CRC	2	5802	CRC	2	5802

Note: When using 06 command to modify the parameters of soft starter, it must be in the state of stop or edit, other states can not be modified successfully. When modifying a parameter, the modified parameters must be specified in the range of manual, if you exceed this range, it can not be modified successfully.

9.8 Communication time interval

(1) “03”command use time interval:

Interval= (17+number of registers *2) *8/baud rate * 1000* 1.2ms;

For example: 9600 baud, read a register value, Interval = (17+1*2) *8/9600 *1000* 1.2=19ms.

“06” command use time interval:

Interval= 20*8/baud rate*1000*1.2ms;

For example: 9600 baud rate, Interval=20*8/9600*1000*1.2=20ms.

9.9 Precautions

When multi-machine communicate, CMC-MX soft starter’s address is unique, that is, any two of the soft starters’ address can not be the same. (Set by parameter C209).

CMC-MX soft starter’s communicate baud rate must be the same with controller’s baud rate. (Set by parameter C210).

When multi CMC-MX soft starters communicate, it should wire 120 ohm resistor to both ends of AB in last soft starter.

9.10 Communication fault code analysis

(1) Write address wrong: Device address +0x86+0x02+CRC

①Address exceed 59

② Not specified writable register

③ Not in the stop or edit status

④ When write control command, communication control start/stop is not turned on.

(2) Write data wrong: Device address +0x86+0x03+CRC

① Write data outside the specified range in the prescribed writable register

② When sending start command, the command data is not right.

(3) Read address wrong: Device address +0x83+0x02+CRC

① Read address exceed 59

(4) Function code error: Device address +(0x80+error function code)+0x01+CRC

① Function code is not required by soft starter



Chapter 10 Routine Maintenance

1. Dust: If too much dust, it will reduce the insulation level of the soft starter, even causes the soft starter does not work.

Brush the dust with clean and dry brush.

Remove dust with compressed air machine.

2. Condensation: If condensation, it will reduce the insulation level of soft starter, even causes the soft starter does not work.

(1) Blow it with a hair dryer or electric stove.

(2) Bring it to power distribution room for dehumidification.

3. Regularly check components' intact. Whether it can work properly.

4. Check soft starter' cooling channel, ensure they are not clogged by dirt and dust.



Before maintenance checking, it has to cut off all power in the line side of soft starter.

Schedule 1: Specifications and Accessories Selection

(Take 380V as an example)

Applicable Motor (KW)	Soft starter model	Rated current (A)	A wire gauge (copper)
7.5	CMC-MX008/3	18	6 mm ²
11	CMC-MX011/3	24	10 mm ²
15	CMC-MX015/3	30	16 mm ²
18.5	CMC-MX018/3	39	16 mm ²
22	CMC-MX022/3	45	16 mm ²
30	CMC-MX030/3	60	25 mm ²
37	CMC-MX037/3	76	25 mm ²
45	CMC-MX045/3	90	35 mm ²
55	CMC-MX055/3	110	50 mm ²

Ordering instructions

When ordering, please provide product models, specifications, load situation and condition of use for supplier, so that supplier can choose the right products.

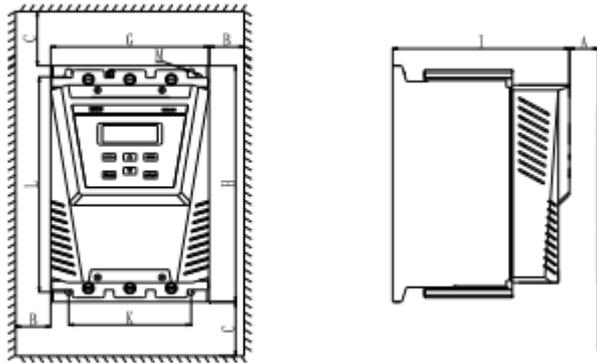
Soft starter standard configuration contacts built-in current transformers and built-in contacts. Users do not need an external current transformer and bypass contactor.

The attachment is for reference only.



Schedule 2: Soft starters shape and hole size (Unit: mm. Take 380V as an example)

Model	Structure Number	G	H	I	K	L	M	A	B	C
CMC-008-55	F010	173	275	192	133	250	7	20	10	100



Schedule 3: Soft Starters Selection

No.	Rated current(A)	380V	660V	Size(mm) (Width*Height*Thickness)
		Applicable Power (KW)	Applicable Power (KW)	
1	18	7.5	15	172*320*167 (Width*Height*Thickness)
2	24	11	22	
3	30	15	30	
4	39	18.5	37	
5	45	22	45	
6	60	30	55	
7	76	37	75	
8	90	45	90	
9	110	55	110	



Schedule 4: The basic setup software for different applications(The following settings for reference only)

Load types	Initial Voltage (%)	Start ramp time sec	Stop ramp time sec	Current limit ILIM
Former boat thruster	25	10	0	2.5
Centrifugal fan	25	20	0	3.5
Centrifugal Pump	25	6	6	3
Piston compressor	25	15	0	3
Lifting machinery	30	15	6	3.5
Mixer	40	15	0	3.5
Crusher	30	15	6	3.5
Spiral compressor	20	15	0	3.5
Spiral conveyer	25	10	6	3.5
No-load motor	25	10	0	2.5
Belt conveyer	25	15	10	3.5
Heat Pump	25	15	6	3
Escalator	25	10	0	3
Air pump	25	10	0	2.5