



Quick Reference Guide



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XI'AN XICHI ELECTRIC CO., LTD.

CMC-HX

SOFT STARTER

380V / 690V / 1140V

CMC-HX soft starter is a new intelligent asynchronous motor starting and protection device. It is a motor terminal control equipment that integrates start, display, protection, and data collection. With the fewer components, user can achieve more complex control functions. The Chinese and English interface display makes the operation much easier. As CMC-HX soft starter is inbuilt with a current transformer, the external one is not needed.

Function

- ◆ Reduce the motor starting current, reduce the distribution capacity, and avoid capacity investment;
- ◆ Reduce the starting stress, extend the life of the motor and related equipment;
- ◆ Smooth start and soft stop avoid the surge problem and water hammer effect of traditional start-up equipment;
- ◆ A variety of starting mode and a wide range of current, voltage and other settings can adapt to a variety of load conditions;
- ◆ Perfect and reliable protective function protects motor and related equipment in a more effective manner.

Characteristics

◆ **Unique SCR triggering close-loop control algorithm**

The unique SCR close-loop control is specially designed for standard load and heavy load. User can choose current-limit start or voltage ramp start according to load conditions so as to realize absolutely smooth start without torque oscillation.

◆ **Unique load application parameters**

It is built-in ten kinds of load types for users to choose. It provides a unique start control curve for each type of load to make soft start match the load, so as to achieve the best start and stop.

◆ **Multiple start and stop modes**

Voltage exponential curve start, voltage linear curve start, current exponential curve start, and current linear curve start. Programmable kick start torque and start current limit can be applied in each mode. According to the different loads, you can choose the corresponding start curve to achieve the appropriate starting effect. The device is provided with a variety of stop modes including programmable soft stop, free stop, braking, and pump stop. Unique basic algorithm makes the motor start and stop accurately and smoothly.

◆ **Advanced communication function**

Standard Modbus RTU communication. Optional Ethernet/GPRS communication module makes user's

network connection control easier and improves the system's automation level and reliability.

◆ **Analog signal control**

Users can input 4-20mA or 0-20mA standard signal, and conduct upper and lower limit setting of analog to achieve the start and stop control of motor and alarm. The data (pressure, temperature, flow, etc.) can also be transmitted via a soft starter. It is provided with 4-20mA or 0-20mA standard analog signal output function.

◆ **Fireproof material**

The product of below 90KW is in plastic structure made with inflaming retarding ABS material; for the product of 90KW and above, the upper cover is in plastic structure and main frame is made of aluminium-zinc plate with features of heatproof and corrosion resistance.

◆ **Movable panel**

The panel can be moved to equipment operating surface through machine interface for remote control.

◆ **Powerful anti-interference property**

All external control signals are subject to optoelectronic isolation, and different anti-noise levels are set to adapt to the application in special industrial environments.

◆ **Dual parameter function**

With two sets of basic parameters, it can control two motors with different power respectively.

◆ **Self-adaption of power frequency**

Self-adaption of power frequency 50/60 makes user easy to use.

◆ **Dynamic fault memory**

Up to 10 failures can be recorded, making it easy to find the cause of the malfunction.

◆ **Perfect protective function**

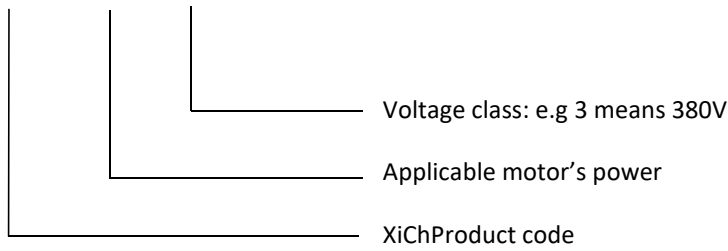
It detects current and load parameters, having overcurrent, overload, underload, overheating, phase failure, short circuit, three-phase current imbalance, phase sequence detection, frequency error and other functions.

◆ **Friendly man-machine interface**

The use of LCD liquid crystal display panel, Chinese and English display interface makes programming and parameter adjustment more convenient.

Description of soft starter's model

CMC-□□□/□-HX

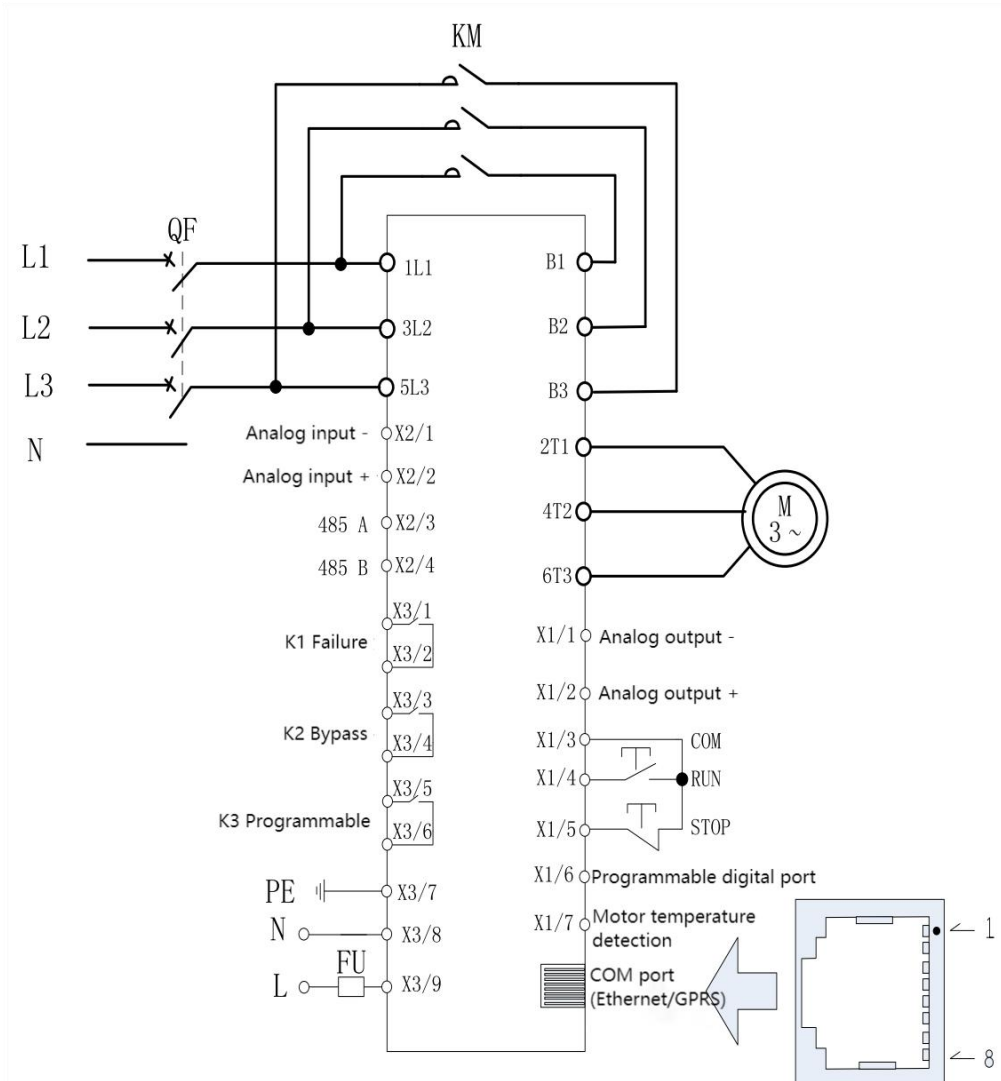


Service conditions

Control power	AC110V to AC220V±15%, 50/60Hz
Three-phase power supply	Standard wiring AC380V / 690V / 1140V ±15% Internal delta wiring AC380V±15%
Nominal current	18A ~ 1200A, 23 rated values in total
Applicable motor	Ordinary squirrel cage AC asynchronous motor
Start mode	Voltage exponential curve; Voltage linear curve; Current exponential curve; Current linear curve.
Stop mode	Free stop, Soft stop, Pump stop, Brake
Logical input	Impedance 1.8 KΩ, power supply +24V
Start frequency	Frequent or infrequent startup can be done, it is recommended that the number of startups per hour does not exceed 10 times
Protective function	Overcurrent, overload, underload, overheat, phase failure, three-phase current imbalance, phase sequence detection, overheat of motor and frequency error, etc.
IP	IP00, IP20
Cooling type	Natural cooling or forced air cooling
Installation type	Wall mounted
Communication method	RS485 (Optional)
Environmental condition	When sea altitude is above 2,000m, soft starter should be derated for use. Ambient temperature: -25 ~ +45°C Relative humidity: less than 95% (20°C±5°C) Free of flammable, explosive and corrosive gas or conductive dust. Indoor installation, good ventilation, vibration less than 0.5G

Basic wiring diagram

Soft starter's terminals **1L1**, **3L2** and **5L3** are connected to 3-phase power supply and terminals **2T1**, **4T2** and **6T3** connected to electric motor. Soft starter's detection of phase sequence can be determined by parameter setting. When bypass contactor is used, one end of contactor is connected to terminals 1L1, 3L2, 5L3 of soft starter and the other end connected to terminals B1, B2, B3.



NOTE:

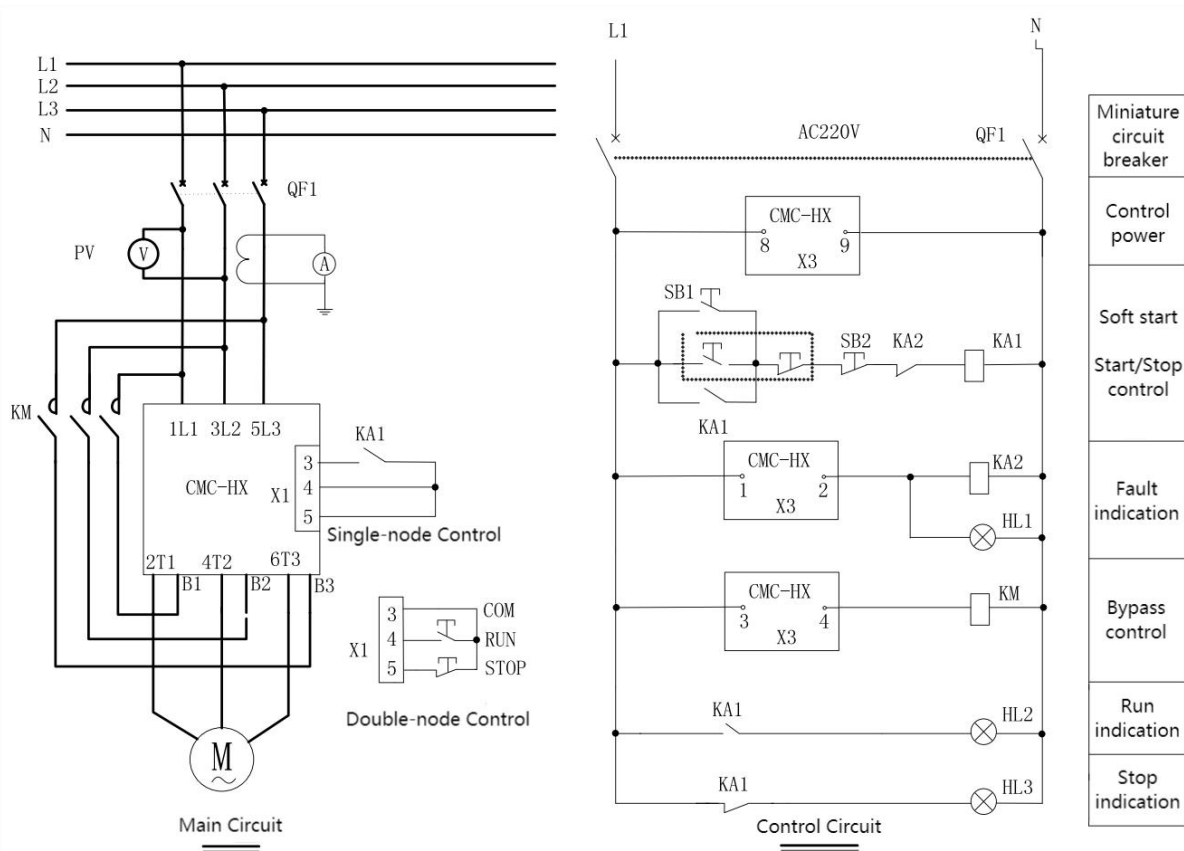
Communication port is a functional interface using optical fiber crystal head connecting terminal. As is shown in the figure, pins 1-8 are arranged in order from up to down. For specific definition of terminal, please refer to definition of terminal.

Wiring diagram for typical application

Notes:

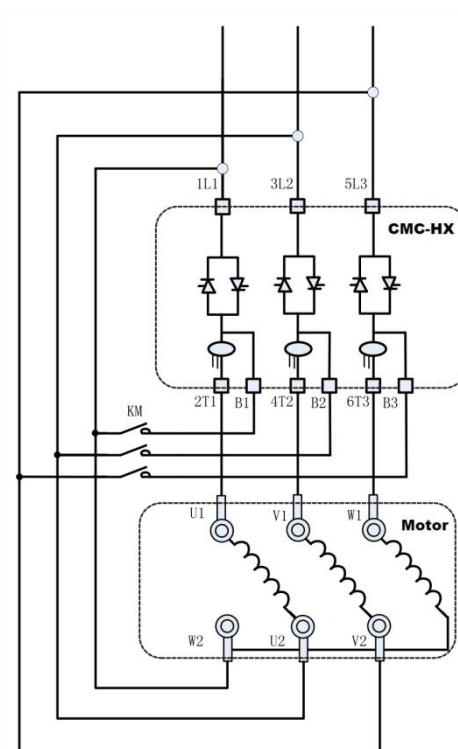
- The above diagram shows the single-node control mode. When contact closes, soft starter starts, otherwise, it stops. But it needs to be noted that LED panel's start is ineffective with this type of wiring. Terminals 3, 4 and 5 start and stop signal is a passive node.

2. PE grounding wire should be as short as possible. It should be connected to an earth connection point close to soft starter. The proper earth connection point should be on installation board and close to soft starter. Installation board should be grounded too. This earth connection is for function rather than protection.



Internal delta connection

When internal delta connection is adopted, please strictly follow the connection below.









Description of terminal

Terminal No.		Name of terminal	Description	
Main circuit	1L1、3L2、5L3	AC power input terminal	Connect to 3-phase AC power supply, bypass contactor	
	2T1, 4T2, 6T3	Soft start output terminal	Connect to 3-phase asynchronous motor	
	B1、B2、B3	Bypass contactor terminal	Connect to bypass contactor	
Control loop	Analog output	X1/1	Analog current output negative (AO-)	Set by parameter C04, C05
		X1/2	Analog current output positive (AO+)	
	Digital input	X1/3	COM	COM
		X1/4	External control start terminal (RUN)	Start if X1/3 and X1/4 are shorted
		X1/5	External control stop terminal (STOP)	Stop if X1/3 and X1/5 are disconnected
		X1/6	Programmable digital port(D1)	Set by parameter item C03
		X1/7	Motor temperature detection (PTC)	Turned off or on by parameter item M22
	Analog input	X2/1	External signal Ground (AGND)	Reference ground for external input current
		X2/2	Analog Input(NI)	Set by parameter item C04
	RS 485-A	X2/3	RS485 Communication Positive (485-A)	
	RS 485-B	X2/4	RS485 Communication Negative (485-B)	
	K1 Relay outputs	X3/1	Fault output relay (K11、K12)	Valid when fault occurs, K11-K12 are closed, contact capacity AC250V/5A, DC30V/5A
		X3/2		
	K2 Relay outputs	X3/3	Bypass output relay (K21、K22)	Valid when bypassing, K21-K22 are closed, contact capacity AC250V/5A, DC30V/5A
		X3/4		
	K3 Relay outputs	X3/5	Programmable output relay (K31、K32)	K31-K32 are closed when the output is valid, contact capacity AC250V/5A, DC30V/5A
		X3/6		
Control power	X3/7	PE	Grounded	
	X3/8	Control power (220VAC)	AC110V - AC220V ± 15% 50/60Hz	
	X3/9			
Optional communication port	GPRS interface	GND 1/2	Power Ground	The terminal definition is used with the basic wiring schematic diagram.
		A+ 3/4	Communication terminal	
		B- 5/6		
	24V 7/8	Power Positive		
Ethernet interface	Use a standard crystal head to connect to the network port of the host computer, MODBUS TCP/IP Communication protocol.			

Attached table1: Specifications and Accessories Selection (take 380V as an example)

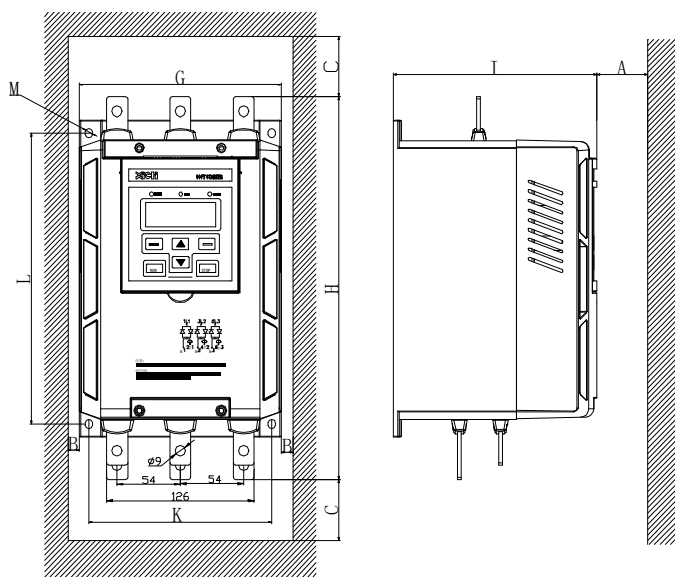
Applicable motor power (kW)	Model of soft starter	Rated current (A)	Model of bypass contactor	Size of primary line (copper line)
7.5	CMC-008/3-HX	18	GSC1-25	4 mm ²
11	CMC-011/3-HX	24	GSC1-32	6 mm ²
15	CMC-015/3-HX	30	GSC1-40	10 mm ²
18.5	CMC-018/3-HX	39	GSC1-50	10 mm ²
22	CMC-022/3-HX	45	GSC1-63	16 mm ²
30	CMC-030/3-HX	60	GSC1-70	25 mm ²
37	CMC-037/3-HX	76	GSC1-95	35 mm ²
45	CMC-045/3-HX	90	GSC2-115F	35 mm ²
55	CMC-055/3-HX	110	GSC2-150F	35 mm ²
75	CMC-075/3-HX	150	GSC2-185F	50 mm ²
90	CMC-090/3-HX	180	GSC2-225F	30×3 copper bar
110	CMC-110/3-HX	218	GSC2-265F	30×3 copper bar
132	CMC-132/3-HX	260	GSC2-330F	30×4 copper bar
160	CMC-160/3-HX	320	GSC2-384F	30×4 copper bar
185	CMC-185/3-HX	370	GSC2-500F	40×4 copper bar
220	CMC-220/3-HX	440	GSC2-550F	40×4 copper bar
250	CMC-250/3-HX	500	GSC2-630F	40×4 copper bar
280	CMC-280/3-HX	560	GSC2-630F	40×4 copper bar
315	CMC-315/3-HX	630	CDC8-800	40×5 copper bar
400	CMC-400/3-HX	780	CDC8-1000	50×5 copper bar
470	CMC-470/3-HX	920	CDC8-1250	50×6 copper bar
530	CMC-530/3-HX	1000	CDC8-1250	50×6 copper bar

Attached table 2: Instructions to installation of accessories of CMC-HX soft starter

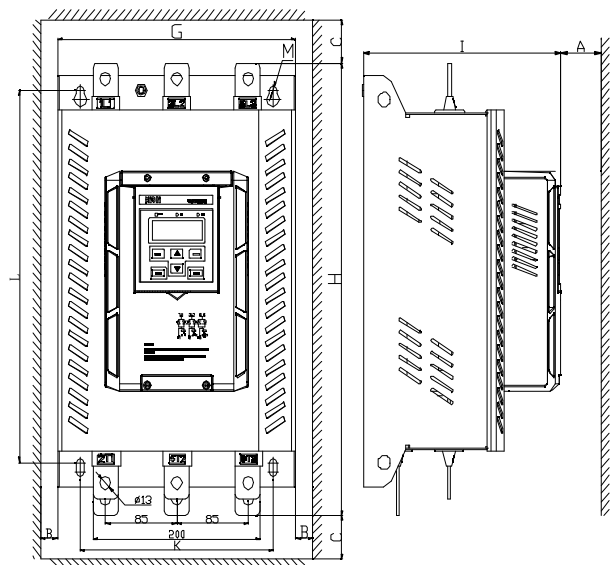
 <p style="text-align: center;">Fig.1</p>	 <p style="text-align: center;">Fig.2</p>	<p>Steps for mounting accessories:</p> <ol style="list-style-type: none"> a. Lock keyboard box's fixing accessory onto door panel, as is shown in figure 1. b. Remove keyboard box from soft starter and dismount tapping screws at the back of keyboard box, as shown in figure 2. c. Insert keyboard box into fixing accessory as shown in figure 1, which is shown in figure 3. 	
 <p style="text-align: center;">Fig.3</p>	 <p style="text-align: center;">Fig. 4</p>		<ol style="list-style-type: none"> d. Use M3X15 tapping screws to fix keyboard box at the back of door panel, as shown in figure 4. e. Screw hex screws into DB9 female head of keyboard box, as shown in figure 5. f. Insert connection line of keyboard box into DB9 female head, as shown in figure 6. g. The installation of CMC-HX soft starter's accessories is completed. <p>Note: Accessories for installation are as follows: Fixing accessory of keyboard box - 1 pc/set Cross round head tapping screw M3X15 - 2 pcs/set Hex screw M3x5+5 - 2 pcs/set External keyboard connection line - 1 pc/set</p> <p>All accessories are enclosed in packing bag. Please check the quantity before installation.</p>
 <p style="text-align: center;">Fig. 5</p>	 <p style="text-align: center;">Fig. 6</p>		

Attached table 3: Dimensions and Hole Sizes (Unit: mm, take 380V as an example)

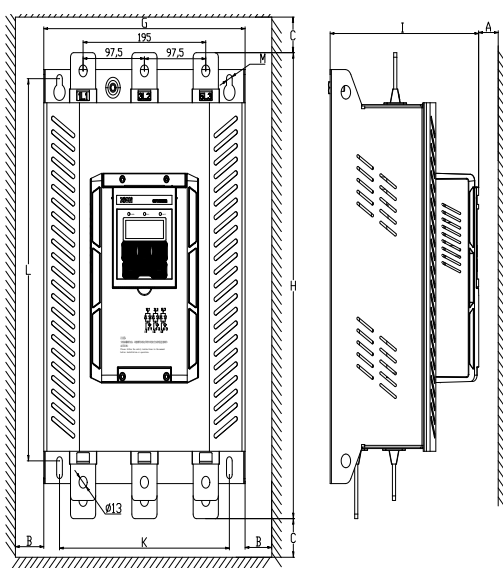
Model	Structure No.	G	H	I	K	L	M	A	B	C	Gross weight (kg)
CMC-008~022/3-HX	F005	172	320	172	156	240	6	20	10	100	4.5
CMC-030~045/3-HX											4.7
CMC-055~075/3-HX											5.1
CMC-090~185/3-HX	F006	285	474	235	230	390	9	20	10	100	20.6
CMC-220~315/3-HX	F007	320	512	235	270	415	9	20	10	100	25.6
CMC-400~630/3-HX	F008	400	647	235	330	495	9	20	10	100	37.6



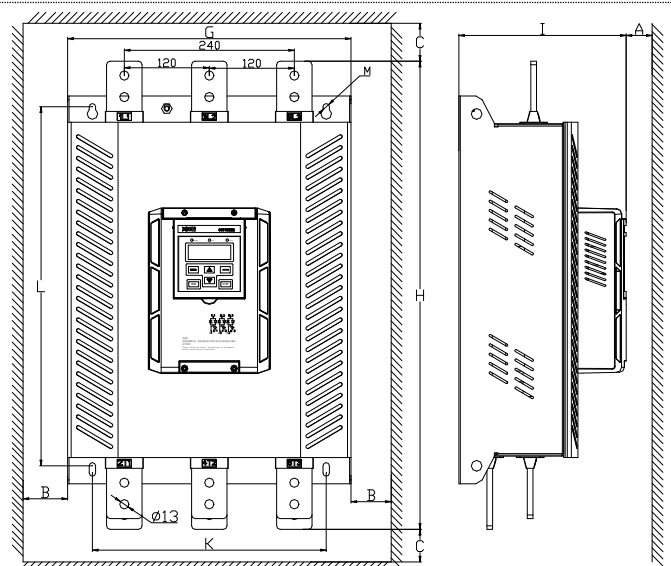
75kW and below - F005



90kW ~ 185kW - F006



220kW ~ 315kW



400kW ~ 530kW

Attached table 4: Model Selection of CMC-HX Soft Starter

No.	Rated current (A)	380V		690V		1140V	
		Motor Power (kW)	Structure No.	Motor Power (kW)	Structure No.	Motor Power (kW)	Structure No.
1	18	7.5	F005	15	F005	22	F005
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			
10	150	75		132			
11	180	90	F006	F006	280	F006	
12	218	110			200		344
13	260	132			250		400
14	320	160			300	505	F007
15	370	185			350	584	
16	440	220	F007	F007	695	F008	
17	500	250			456		789
18	560	280			500		884
19	630	315	F008	F008	995		
20	780	400			700		
21	920	470					
22	1000	530					
23	1200	630					

F005: 172*320*172mm;

F006: 285*475*235mm;

F007: 320*512*235mm;

F008: 400*647*235mm.

Ordering

- When placing an order, please inform the supplier of the product model, specifications, load conditions and conditions of use in order to select the product correctly.
- The standard configuration of the soft starter includes a current transformer, and users do not need to connect an external current transformer.
- For users who have special requirements for this product, please explain to the supplier when ordering, and we will provide perfect services.



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If there is any change in product size and parameters, please refer to the latest product.