Be careful
When using DC braking, the power supply and soft starter (input terminals L1, L2, L3) must be connected in positive phase sequence, and the parameter 4G phase sequence must be set to positive.

Be careful
If the load may change during braking, install a zero speed sensor to ensure that the soft starter stops DC braking when the motor stops.
This can avoid unnecessary heating of the motor.

For details on how to use a soft starter with an external speed sensor (for example, in applications where the load changes during braking), see DC braking with an external zero speed sensor on page 57.

8.5 Jog Operation

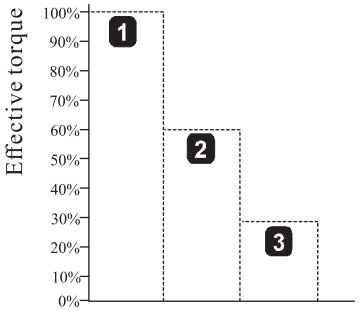
Jog to slow down the motor in order to adjust the load or assist in maintenance. The motor can either jog forward or jog reverse.

Look out
Low speed operation makes the cooling effect of motor decrease, so it is not suitable for continuous operation mode.

Inching operation makes the heating speed of the motor faster than that calculated by the thermal protection model of the motor. If inching operation is used, install - a motor thermistor, or set a restart delay long enough (parameter 4m).

Be careful
Soft start and soft stop cannot be used during inching operation.
Inching is only applicable to group motor. For a detailed understanding of the -- group motor settings and the second group motor settings, refer to the second group motor settings.
For different motor models, the maximum forward inching torque is about 50% - 75% of the rated torque (FLT). The torque of motor reverse inching is about 25% to 50% of rated torque.
Valuepoint 15E the ratio of the torque applied to the motor by the inching torque control to the maximum inching torque of the soft starter.

Be careful
If parameter 15E is set above 50%, shaft vibration may be increased.



1. Rated torque of motor
2. Maximum torque of inching forward rotation
3. Maximum torque of inching reverse

To activate the jog operation, you can use the programmable inputs (see parameters 6a and 6F [only operate in remote control mode]), or you can use the shortcut keys (parameters 8b and 8C).

To stop the jog operation, do one of the following:

- Cancel the jog command.
- Press the stop button on the operator panel.

If the jog command is still valid, start the jog again after the end of the restart delay. During the jog operation, all commands except the above are ignored.

8.6 Working With Triangle Connection Method

The triangle (six wire) connection method does not support adaptive control, inching, braking and two-phase control functions. If these functions are programmed when the starter is connected by the triangle connection method, the control characteristics are as follows:

Adaptive control start	The starter performs a constant current start. .
Adaptive control stop	If the stop time of parameter 2I is set to be greater than 0 s, the starter will perform the soft stop of timing voltage ramp. If parameter 2I is set to 0 seconds, the starter performs a coast down stop.
Point movement	Starter alarm with error message: option not supported.
Braking	The starter performs a coastdown stop.
Two phase control	The starter trips and displays the error message: LX TX short circuit.

Be careful
If the triangle connection method is adopted, the current unbalance protection is the only phase loss protection during operation. Do not disable the current unbalance protection (parameter 4h) when the delta connection method is used.

Be careful
If delta connection method is adopted, input the rated current of motor with parameter 1A. The soft starter automatically detects whether the motor is connected by the star connection method or the triangle connection method, and calculates the correct current of the triangle connection.

Chapter 9 Programming Menu

The programming menu can be accessed at any time, including when the soft starter is running. Any changes to the starting curve take effect immediately.

The programming menu has four submenus:

Quick setup quick setup guides you through how to configure the parameters required for soft starters for common applications. Quickly set up suggestions for each parameter - a value, but you can make more Change these values.

Standard menu

standard menu is convenient for you to access common parameters. You can configure the soft starter according to your own application here.

Extended menu

extended menu is convenient for you to access all programmable parameters of the soft starter, and experienced users can make full use of advanced functions.

Load / save settings

load / save settings allows you to save the current parameter settings to a file, load the parameters in the previously saved file, or reset all parameters to the Default value.

9.1 Programming Menu

You can use the programming menu to view and change programmable parameters that control how the soft starter works.
While viewing the monitoring screen, press the menu button to open the programming menu.
Browse "Programming Menu":

- Press ▲ or ▼ to scroll through the parameter groups.
- Press ▶ button to open the submenu.
- Press ▶ button to view the parameters in the parameter group.
- Press ◀ button to return to the previous menu.
- To close the Programming Menu, press repeatedly ◀

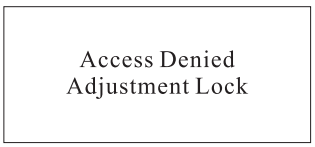
Change parameter value:
Scroll to the corresponding parameter in the "Programming Menu" and press ▶ to enter edit mode.

- Use the ▲ and ▼ buttons to change parameter settings. Press the ▲ or ▼ button once to increase or decrease the parameter value by one unit. If the button is held down for more than five seconds, the parameter value will increase or decrease faster.
- To save the changes, press Menu. The settings on the display will be saved and the control panel will return to the parameter list.
- To cancel changes, press EXIT. The operator panel will ask if you want to confirm the cancellation, then return to the parameter table without saving the changes.

9.2 Parameter Write Protection

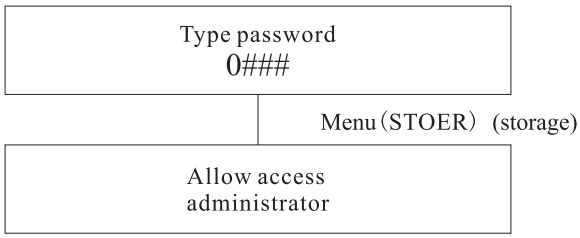
The programming menu can be locked to prevent users from modifying parameter settings. Can be write protected with parameter 15B switch parameter.
Lock programming menu:
1. Open the programming menu.
2. Open the extended menu.
3. Select 'Advanced'.
4. Enter the access password.
5. Select parameter 15B parameter write protection
6. Select and store 'Read Only'.

If the user attempts to change the parameter value after the parameter write protection is turned on, an error message is displayed:



9.3 Access Password

Important parameters (parameter groups of 15 and above) are protected with four-digit secure access passwords to prevent unauthorized users from viewing or modifying parameter settings.
When the user attempts to enter the restricted parameter group, the operation panel prompts for a password. The programming session only requires the user to enter a-access password. Authorization-is valid until the user closes the menu.
To enter the access code, use ◀ and ▶ buttons to select a digit, and then use the ▲ and ▼ buttons to change the value. When all four digits are the same as the access code, press Menu (STORE)(storage). The operation panel will display a confirmation message before continuing.



To change the access code, use parameter 15A.
Simulation tools and counter resets can also be protected with secure access codes.
The default access password is 0000.

9.4 Quick Setup

The Quick Setup menu allows you to quickly configure the soft starter for common applications. The soft starter selects the parameters related to the application and recommends typical settings. You can adjust each parameter according to your actual needs.
Always set parameter 1A, the rated current of the motor to match the rated current indicated on the motor plate. The recommended value is the minimum rated current of the starter.
On the screen, the highlighted value is the recommended value, and the value marked with ➤ is the loaded value.

Application	Parameter	Suggested Value
Centrifugal pump	Motor rated current Starting method Adaptive starting curve Start ramp time Stop mode Adaptive stop curve Stop time	Depending on model Adaptive Control Early acceleration 10 seconds Adaptive Control Deceleration 15 seconds
Submersible pump	Motor rated current Starting method Adaptive starting curve Start ramp time Stop mode Adaptive stop curve Stop time	Depending on the model. Adaptive Control Speed up early. 5 seconds Adaptive Control After decelerating. 5 seconds
Damped fan	Motor rated current Starting method Current limit	Depending on model Constant current 350%
Undamped fan	Motor rated current Starting method Adaptive starting curve Start ramp time Starting limit time Locked rotor time	Depending on model Adaptive Control Constant acceleration 20 seconds 30 seconds 20 seconds
Screw compressor	Motor rated current Starting method Start ramp time Current limit	Depending on model Constant current 5 seconds 400%
Reciprocating compressor	Motor rated current Starting method	Depending on model Constant current

	Start ramp time Current limit	5 Second 450%
Conveyor belt	Motor rated current Starting method Start ramp time Current limit Stop mode Adaptive stop curve Stop time	Depending on model Constant current 5 seconds 400% Adaptive Control Constant deceleration. 10 seconds
Rotary crusher	Motor rated current Starting method Start ramp time Current limit Starting limit time Locked rotor time	Depending on model Constant current 10 seconds 400% 30 seconds 20 seconds
Jaw Crusher	Motor rated current Starting method Start ramp time Current limit Starting limit time Locked rotor time	Depending on model Constant current 10 seconds 450% 40 seconds 30 seconds

9.5 Standard Menu

The standard menu provides access to common parameters, and users can configure the soft starter according to their application needs. For detailed information on each parameter, see Parameter Descriptions on page 37.

		Parameter group	Default Setting
1		Motor data-1	
	1A	Motor rated current	Depending On Model
2		Start / Stop Mode-1	
	2A	Starting method	Constant Current
	2B	Start ramp time	10s
	2C	Initial current	350%
	2D	Current limit	350%
	2H	Stop mode	Taxi Stop
	2I	Stop time	0s
3		Automatic start / stop	
	3A	Automatic start mode	Turn Off
	3B	Auto start time	1m
	3C	Automatic stop mode	Turn Off
	3D	Auto stop time	1m
4		Protection settings	
	4A	Starting limit time	20s
	4C	Under current	20%
	4D	Undercurrent delay	5s
	4E	Instantaneous overcurrent	400%
	4F	Instantaneous overcurrent delay	0s
	4G	Phase sequence	Any Order
6		Enter	
	6A	Input A function	Motor Parameter Selection
	6B	Enter A name	Input Trip
	6C	Input A tripped	Always Open
	6D	Input A Trip Delay	0s
	6E	Input A initial delay	0s

	6F	Input B function	Input trip (N / 0)
	6G	Enter B name	Input trip
	6H	Input B tripped	Always open
	6I	Input B trip delay	0s
	6J	Input B initial delay	0s
7		Output	
	7A	Relay a function	Main contactor
	7B	Relay a opening delay	0s
	7C	Relay a off delay	0s
	7D	Relay B function	Run
	7E	Relay B on delay	0s
	7F	Relay B off delay	0s
	7G	Relay C function	Tripping operation
	7H	Relay C on delay	0s
	7I	Relay C off delay	0s
	7M	Low current indication	50%
	7N	High current indication	100%
	7O	Motor temperature indication	80%
8		Monitor	
	8A	Language	English
	8B	F1button function	Auto start / stop setting
	8C	F2 button function	Not set up
	8D	Display current or power	Electric current
	8E	Top left corner of screen	Starter status
	8F	Top right corner of screen	Blank
	8G	Bottom left corner of screen	Operating hours
	8H	Bottom right corner of screen	Analog input

9.6 Extended Menu

The extended menu provides access to all programmable parameters of the soft starter.

		Parameter group	Default setting
1		Motor Data-1	
	1A	Rated current of motor	Depending on Model
	1B	Locked to f time	0m: 10s
	1C	Locked rotor current	600%
	1D	Service factor of motor	105%
2		Start / stop MODE-1	
	2A	Starting mode	Constant current
	2B	Starting ramp time	10 s
	2C	Initial current	350%
	2D	Current limit	350%
	2E	Adaptive starting curve	Constant acceleration
	2F	Jump start time	0000ms
	2G	Jump start amplitude	500%
	2H	Stop mode	Taxi stop
	2I	Stopping time	0m:00s
	2J	Adaptive stop curve	Constant deceleration
	2K	Adaptive control gain	75%
	2L	Braking torque	20%
	2M	Braking time	0m:01s

3		Auto start / stop	
	3A	Auto start mode	OFF
	3B	Auto start time	00h:01m
	3C	Automatic stop mode	OFF
	3D	Auto stop time	00h:01m
4		Protection settings	
	4A	Starting limit time	0m:20s
	4B	Starting limit Time-2	0m:20s
	4C	Under current	20%
	4D	Under current delay	0m:05s
	4E	Instantaneous overcurrent	400%
	4F	Instantaneous overcurrent delay	0m:00s
	4G	Phase sequence	Any order
	4H	Current imbalance	30%
	4I	Current unbalance delay	0m:03s
	4J	frequency measurement	Starting and running
	4K	Frequency change	± 5Hz
	4L	Frequency delay	0m:01s
	4M	Restart delay	10s
	4N	Motor temperature measurement	No measurement
	4O	Earth fault current	100 mA
	4P	Earth fault delay	0m:03s
	4Q	Undervoltage	100V
	4R	Undervoltage delay	5s
	4S	Overvoltage	800V
	4T	Overvoltage delay	5s
5		Automatic reset trip	
	5A	Automatic reset function,	Turn off automatic reset
	5B	Maximum reset times	1
	5C	A / b reset delay	00m:05s
	5D	C reset delay	05 m
6		input	
	6A	Input a function	Motor parameter selection
	6B	Enter a name	Input tripping
	6C	Input a trip	Always open
	6D	Input a trip delay	0m:00s
	6E	Input a initial delay	0m:00s
	6F	Input B function	Input trip (n / 0)
	6G	Enter B name	Input tripping
	6H	Input B trip	Always open
	6I	Input B trip delay	0m:00s
	6J	Input B initial delay	00m:00s
	6K	Input C function	shut
	6L	Input D function	shut
	6M	Remote reset logic	Normally closed (N/C)
	6N	Analog input trip	No tripping
	6O	Analog input range	2-10 V
	6P	Simulated trip point	50%
	6Q	Local) remote:	Always open
	6R	Telecontrol communication	Enable during remote control
7		output	
	7A	Relay a function	Main contactor

	7B	Relay a opening delay	0m:00s
	7C	Relay a off delay	0m:00s
	7D	Relay B function	RUN
	7E	Relay B on delay	0m:00s
	7F	Relay B off delay	0m:00s
	7G	Relay C function	Tripping operation
	7H	Relay CF on delay	0m:00s
	7I	Relay C off delay	0m:00s
	7J	Relay D function	OFF
	7K	Relay e function	OFF
	7L	Relay F function	OFF
	7M	Low current indication	50%
	7N	High current indication	100%
	7O	Motor temperature indication	80%
	7P	Analog output a	Current (% rated current)
	7Q	Analog a range	4-20 mA
	7R	Analog a max	100%
	7S	Analog a min	000%
	7T	Analog output B	Current (% rated current)
	7U	Analog B range	4-20 mA
	7V	Analog B Max	100%
	7W	Analog B min	000%
8		Monitor	
	8A	language	English
	8B	F1button function	Auto start / stop setting
	8C	F2 button function	Not set up
	8D	Display current or power	Electric current
	8E	Top left corner of screen	Starter status
	8F	Top right corner of screen	blank
	8G	Bottom left corner of screen	Operating hours
	8H	Bottom right corner of screen	Analog input
	8I	graphic data	Current (% rated current)
	8J	Graphic display period	10s
	8K	Graphic display maximum	400%
	8L	Graphic display minimum	000%
	8M	Current calibration	100%
	8N	Main supply voltage	400 V
	8O	Voltage calibration	100%
9		Motor data-2	
	9A	Double thermal protection model	Single model
	9B	Motor rated current - 2	Depending on Model
	9C	Lock to Time-2	0m:10s
	9D	Locked rotor current-2	600%
	9E	Motor Service factor-2	105%
1 0		Start / stop mode-2	
	10A	Starting mode-2	Constant current
	10B	Starting ramp-2	0m:10s
	10C	Initial current - 2	350%
	10D	Current LIMIT-2	350%
	10E	Adaptive starting curve-2	Constant acceleration
	10F	Jump start Time-2	0000 ms
	10G	Jump start amplitude-2	500%

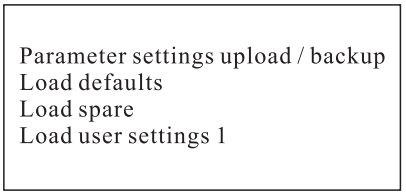
	10H	Stop mode-2	Taxi stop
	10I	Stop Time-2	0m:00s
	10J	Adaptive stop curve-2	Constant deceleration
	10K	Adaptive control gain-2	75%
	10L	Brake torque-2	20%
	10M	Braking Time-2	0m:01s
11		RTD temperature	
	11A	*RTD/PT100 A°C*	50 °C (122 °F)
	11B	*RTD/PT100 B°C*	50 °C (122 °F)
	11C	*RTD/PT100 C°C*	50 °C (122 °F)
	11D	*RTD/PT100 D°C*	50 °C (122 °F)
	11E	*RTD/PT100 E°C*	50 °C (122 °F)
	11F	*RTD/PT100 F°C*	50 °C (122 °F)
	11G	*RTD/PT100 G°C*	50 °C (122 °F)
12		Slip ring motor	
	12A	Motor data 1 ramp	Single slope
	12B	Motor data 2 ramp	Single slope
	12C	Conversion time	150 ms
	12D	Slip ring deceleration	50%
15		Advanced requires an access password. Default value: 000	
	15A	Access password	0000
	15B	Parameter write protection	Read and write
	15C	Emergency operation	Prohibit
	15D	Short circuit thyristor action	Three phase control only
	15E	Point torque	50%
16		protective measures	
	16A	motor overload	Starter trip
	16B	Starting limit time	Starter trip
	16C	Under current	Starter trip
	16D	Instantaneous overcurrent	Starter trip
	16E	Current imbalance	Starter trip
	16F	frequency	Starter trip
	16G	Input a trip	Starter trip
	16H	Input B trip	Starter trip
	16I	Motor thermistor	Starter trip
	16J	Starter communication	Starter trip
	16K	Network communication failure	Starter trip
	16L	heatsink OT	Starter trip
	16M	Battery clock failure	Starter trip
	16N	Grounding fault	Starter trip
	16O	*RTD/PT100 A*	Starter trip
	16P	*RTD/PT100 B*	Starter trip
	16Q	*RTD/PT100 C*	Starter trip
	16R	*RTD/PT100 D*	Starter trip
	16S	*RTD/PT100 E*	Starter trip
	16T	*RTD/PT100 F*	Starter trip
	16U	*RTD/PT100 G*	Starter trip
	16V	Retain	–
	16W	Retain	–
	16X	Low control voltage	Starter trip
20		limit	
		Factory use only	

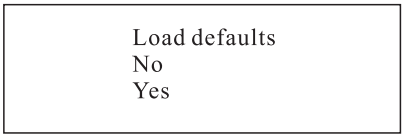
9.7 Load / Save Settings

You must enter the access password to access the load / save settings menu, where you can:
- default value of Loading Soft Starter parameters
- reload the parameter settings previously saved in the internal file
- save the current parameter settings in the internal file

In addition to the factory default file, the soft starter can store two custom parameter files. Before you save user files, they contain default values.

Load or save parameter settings:
1. Open the programming menu.
2. Flip to load / save settings and press ▶ button.
3. Turn to the required function and press ▶ button.
4. When prompted for confirmation, select Yes to confirm or no to cancel
Then press the menu (store) button to load / save the selection.





After completing this operation, the screen displays a short confirmation message and then returns to the status screen.

Be careful
The saved file and the current working settings are stored in both the operation panel and the soft starter. Whenever you insert the dashboard into a new soft starter, the dashboard prompts you to synchronize the settings.

9.8 parameter description

1 motor data 1

The parameters in motor data 1 are used to configure the soft starter to match the connected motor. These parameters describe the operation characteristics of the motor, so that the soft starter can establish the temperature model of the motor.

Be careful
If delta connection method is adopted, input the rated current of motor with parameter 1a. The soft starter automatically detects whether the motor is connected by the star connection method or the triangle connection method, and calculates the correct current of the triangle connection.

1A - rated current of motor

Range: Depending on Model

Explain: Match the starter to the rated current of the connected motor. Set the rated current indicated on the motor label.

1B — locked rotor time

Range: 0:01-2:00(minutes: seconds) Default: 10 seconds

Explain: Sets the maximum time required for the motor to move from cold to maximum temperature with locked rotor current.Set according to motor data sheet.

1C — Locked rotor current

Range: 400%-1200% Rated current Default value: 600%

Explain: Set the locked rotor current of the connected motor as a percentage of the rated current. Set according to motor data sheet.

1D — Starting mode motor service factor

Range: 100%-130% Default value: 105%

Explain: Set the service factor of the motor used in the thermal protection model. If the motor operates at rated current, the service factor of the motor is 100%.
Set according to motor data sheet.

Be careful
Parameters 1b, 1c and 1D determine the trip current of the motor overload protection. The default settings for parameters 1b, 1c and 1D provide motor overload protection: class 10, trip current, 105% of FLA (rated current) or equivalent.

2 start / stop mode 1

2A - starting mode

Options: Constant current (default)
adaptive control

Explain: Select soft start mode.

2B — Starting ramp time

Options: 1 - 180 (seconds) Default value:10 seconds

Explain: Set the total start time of adaptive control starting or the ramp time of current ramp starting (from initial current to current limit).

2C — Initial current

Options: 100% - 600% rated current Default: 350%

Explain: Set the initial starting current for current ramp starting as a percentage of the rated current of the motor. Set the initial current so that the motor starts to accelerate immediately after starting.If current ramp starting is not required, set the initial current to the same value as the current limit.

2D — Current limit

Options: 100% - 600% rated current Default: 350%

Explain: Set the current limit of constant current soft start and current ramp soft start as the percentage of rated motor current.

2E — Adaptive starting curve

Options: Early acceleration
Constant acceleration (default)

Explain: Post acceleration
Select which curve the soft starter uses for adaptive control soft start.

2F — Jump start time

Options: 0–2000 ms Default: 0000 MS

Explain: Set the jump start duration. A setting of 0 disables jump start.

2G — Jump start amplitude

Options: 100% - 700% rated current Default: 500%

Explain:

Look out
Sudden start-up increases the torque of mechanical equipment. Before using this function, make sure that the motor, load and coupling can withstand additional torque.

2H — Stopping mode

Options: Taxi stop (default)

Explain: TVR soft stop
adaptive control
braking
Select the stop mode.

2I — Stopping time

Options: 0:00-4:00(Minute:seconds) Default: 0 (seconds)

Explain: Set the time required to soft stop the motor using a timed voltage ramp or adaptive control. At the same time, set the total stop time when the braking mode is adopted.
If a main contactor is installed, it must remain closed until the end of the stop time. Use one of the programmable relays to control the main contactor.

2J—Adaptive stop curve

Options: Early deceleration
Constant deceleration (default)
After deceleration

Explain: Select which curve the soft starter uses for soft stop adaptive control.

2K — Adaptive control gain

Range: 1% - 200% Default: 75%

Explain: Adjust the performance of the adaptive control.
This setting affects both the start control and the stop control.

Be careful
We recommend that you leave the gain setting at the default value, unless the performance does not meet the requirements.
If the motor accelerates rapidly at the end of starting or decelerates rapidly at the end of stopping, increase the gain setting by 5% ^ 10%. If the motor speed fluctuates during start or stop, slightly decrease - a little gain setting.

2L — Braking torque

Options: 20%-100% Default: 20%

Explain: Set the brake torque used by soft starter to slow down the motor.

2M — Braking time

Range: 1-30 (seconds) Default: 1 second

Note: set the duration of DC power supply during braking stop.

Be careful Parameter 2M and parameter 2I are used. See braking for details.

3 Auto start / stop

The soft starter can be programmed to start and stop automatically after a specified delay or at a specified time of day. Automatic start and automatic stop can be set separately.

The auto start / auto stop operation can only be used in remote mode. In local mode, the starter will ignore all auto start / auto stop settings.

Look out.
The auto start timer covers all other controls. The motor may start without warning.

warning
This function should not be used with a two wire remote control.
The soft starter still receives start and stop commands from the remote input or serial communication network. To disable local control or remote control, use parameter 6q.
If auto start is enabled, but the user is still in the menu system, activate auto start after menu timeout (no operation board activity is detected within 5 minutes).

3A — Auto start mode

Option: off (default) soft starter will not start automatically.
After the timer stops next time, the soft starter will start automatically after the delay specified in parameter 3B.

Note: the clock soft starter will start automatically at the time set in parameter 3B.
Select whether the soft starter will start automatically after the specified delay or at the specified time of one day.

3B — Auto start time

Options: 00:01 - 24:00 (hour: minute) Default: 1 minute

Explain: Set the soft starter auto start time in 24-hour clock format.