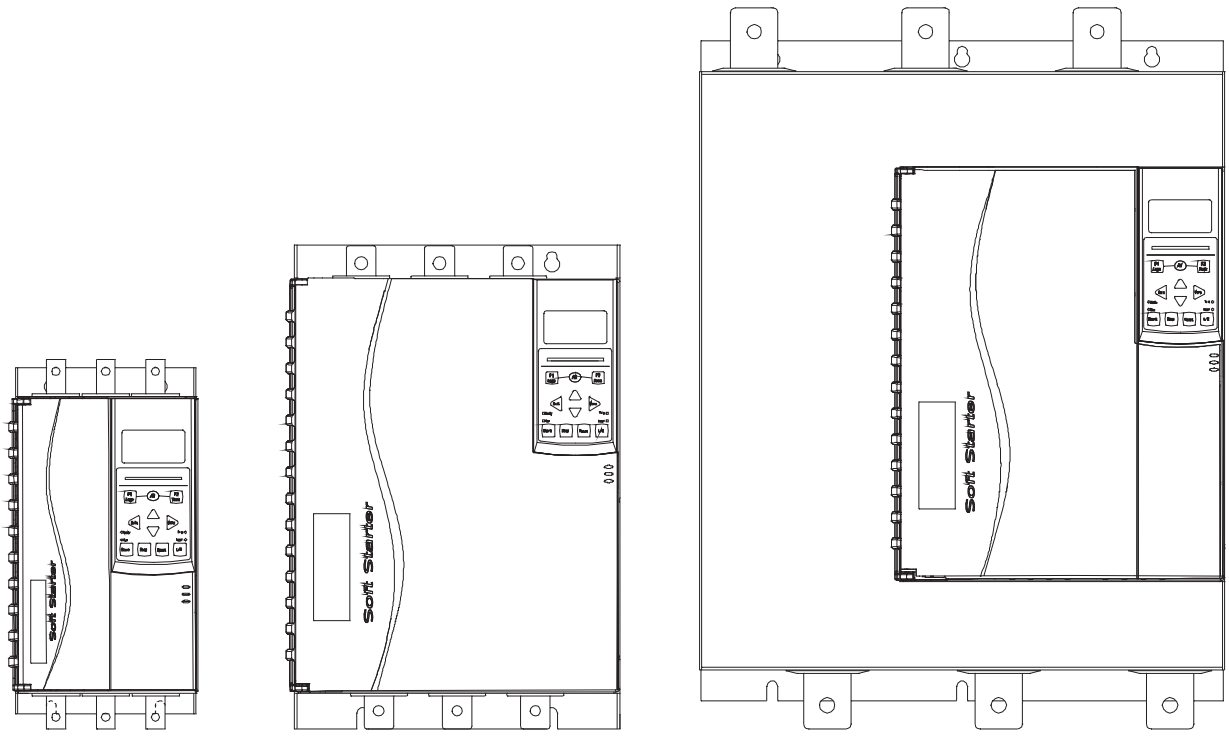
CHZIRI®

User's Manual

ZJR7000 Series
Built-in Bypass Motor Soft Starter



ZIRI ELECTRICAL TECHNOLOGY CO.,LTD.

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Section 1 Caution Statements

The use of this symbol in this manual reminds the reader to pay special attention to special precautions regarding the installation and operation of the equipment.

Caution Statements cannot cover every potential cause of equipment damage but can highlight common causes of damage. It is the installer's responsibility to read and understand all instructions in this manual prior to installing,operating or maintaining the soft starter, to follow good electrical practice including applying appropriate personal protective equipment and to seek advice before operating this equipment in a manner other than as described in this manual.

NOTE

The user cannot repair the soft starter. The soft starter should only be repaired by authorized service personnel. Unauthorized modification of the starter will void the product warranty.

1.1 Electrical Shock Risk

The voltages present in the following locations can cause severe electric shock and may be lethal:

- AC supply cables and connections
- Output cables and connections
- Many internal parts of the starter, and external option units

The AC supply must be disconnected from the starter using an approved isolation device before any cover is removed from the starter or before any servicing work is performed.

WARNING DANGER OF ELECTRIC SHOCK

132kW and above: As long as the power supply voltage is connected (including when the starter trips or waits for a command), the bus and radiator must be regarded as charged.

SHORT CIRCUIT

It cannot prevent short circuit. After severe overload or short circuit occurs, the operation of soft start should be fully tested by an authorized service agent.

GROUNDING AND BRANCH CIRCUIT PROTECTION

It is the responsibility of the user or person installing the soft starter to provide proper grounding and branch circuit protection according to local electrical safety codes.

FOR YOUR SAFETY

- The STOP function of the soft starter does not isolate dangerous voltages from the output of the starter. The soft starter must be disconnected by an approved electrical isolation device before accessing electrical connections.
- Soft starter protection features apply to motor protection only. It is the user's responsibility to ensure safety of personnel operating machinery.
- In some installations, accidental starts may pose an increased risk to safety of personnel or damage to the machines being driven. In such cases, it is recommended that the power supply to the soft starter is fitted with an isolating switch and a circuit-breaking device (eg power contactor) controllable through an external safety system (eg emergency stop, fault detector).
- The soft starter has built-in protections which can trip the starter in the event of faults and thus stop the motor. Voltage fluctuations, power cuts and motor jams may also cause the motor to trip.
- There is a possibility of the motor restarting after the causes of shutdown are rectified, which may be dangerous for certain machines or installations. In such cases, it is essential that appropriate arrangements are made against restarting after unscheduled stops of the motor.
- The soft starter is a component designed for integration within an electrical system; it is therefore the responsibility of the system designer/user to ensure the system is safe and designed to comply with relevant local safety standards.

AuCom cannot be held accountable for any damages incurred if the above recommendations are not complied with.

AUTO- - START

Use the auto-start feature with caution. Read all the notes related to auto-start before operation.

The examples and diagrams in this manual are included solely for illustrative purposes. The information contained in this manual is subject to change at any time and without prior notice. In no event will responsibility or liability be accepted for direct, indirect or consequential damages resulting from the use or application of this equipment.

1.2 Disposal Instructions

Equipment containing electrical components may not be disposed of together with domestic waste.

It must be collected separately as electrical and electronic waste according to local and currently valid legislation.

Section 2 Introduction

This soft starter is an advanced digital soft starter solution for motors with power from 11kW to 850kW. Provides a complete set of motor and system protection functions to ensure reliable performance even in the harshest installation environments.

2.1 Feature List

Optional soft start curve
- Adaptive control
- Constant current
- Current ramp

Optional soft stop curve
- Taxi stop
- Timed voltage ramp soft stop
- Adaptive control
- Brake

Extended input and output options
- Remote control input
(3 fixed inputs, 2 programmable inputs)
- Relay output
(1 fixed output, 3 programmable outputs)
- Analog output
- Built-in PT100 RTD input
- Optional expansion card

Easy-to-read display shows comprehensive feedback
- Removable operation panel
- Multilingual feedback
- Event record with date and time stamp
- Working counter (starting times, running hours, kilowatt hours)
- Performance monitoring (current, voltage, power factor, kilowatt hours)
- User-programmable monitoring screen

Customizable protection
- Motor overload
- Start-up timeout
- Under current
- Transient overcurrent
- Current imbalance
- Power frequency
- Input trip
- Motor thermistor
- Power circuit
- Phase sequence

Models that meet all your connectivity needs
- 23A-1600A (rated)
- 200VAC-440VAC
- 380VAC-690VAC
- Internal bypass selection
- Star connection or delta connection

Advanced application optional features
- Input / output extension
- RTD and ground fault protection
- DeviceNet, Modbus, Profibus, Ethernet (Ethernet IP, Modbus TCP, Profinet) or USB communication module

Section 3 Basic Setting

3.1 Setting Procedure Summary

Waring Before cable connection,do not put power supply voltage on soft starter

1.Install soft starter (refer to installation Page 5 to know details)

2.Connect control cable(refer to control terminal Page 5 and control cable page 6)

3.Control voltage applied to soft starter

4.Set up date and time(refer to Page 18)

5.Equipped your application

1.push MENU,open Menu.

2.use ▼ to 'fast setting',then push ▼ to open 'fast setting' menu.

3.Find your application in the list,then push ▶ to start setting

6.If your application not in list of 'fast setting' list

1.push ◀ return to 'menu'

2.use ▼ turn to 'standard menu',then press ▶

3.turn to 'motor data 1' press ▶ ,then press ▶ ,edit parameter 1A motor rated current

4. set up parameter 1A to match rated current

Attention

regarding to senior application,please refer to extension menu page 33 and parameter instruction page 37.

7.Press ◀ many times,close menu

8.Optional using built in simulation tool check and control routing connection correct or not

9.Connect power supply line and soft starter input terminal 1/L1,3/L2,5/L3

Connect motor cable and soft starter's output 2/T1,4/T2,6/T3

3.2 Testing Equipment Installation

You can test the soft start by connecting it to a small motor. During this test, you can test the soft starter control input and relay output protection settings. This test mode is not suitable for testing soft-start performance or soft-stop performance.

The rated current of the test motor is at least 2% of the minimum rated current of the soft starter (see Minimum and Maximum Current Setting on page 71).

Attention

When testing the soft starter with a small motor, set parameter 1A Motor Rated Current to the minimum allowed value.

3.3 Simulation Tool

Software simulation function allows you test working situation and control circuit under conditions of no connection with soft starter

- **Run simulation**
  Simulate the starting, running, and stopping of the motor, and confirm that the soft starter and related equipment are installed correctly. See Run Simulation on page 19 for more information.
- **Protect simulation**
  Simulate each protection mode activitation,confirming soft starter and relative equipment reaction.refer to simulation protection Page 19
- **Output signal simulation**
  Simulate output signal,confirming output and relative control circuit work normally.Refer to signal simulation Page 20

Only when soft starter in condition on ready with control voltage,operation panel in active mode,you can use simulation fuction

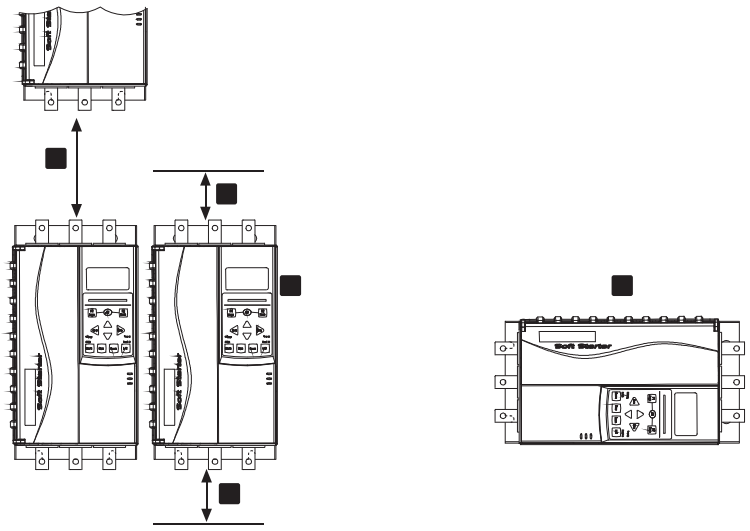
Attention

Input password when using simulation tool

The default access password is 0000

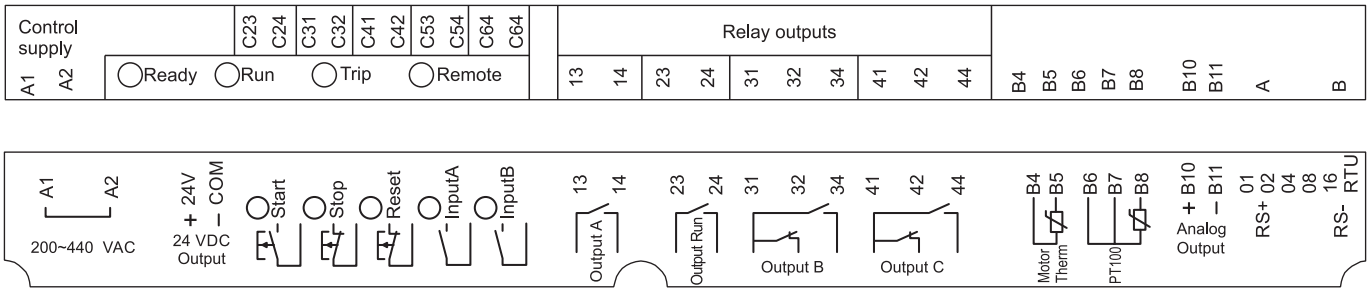
Chapter 4 Installation

4.1 Physical Installation



1	10023B~0220B: distance allowed between soft starter 100mm(3.94 inch) 20255B~1000B: Allow distance among soft starer 200mm (7.88ch)
2	0023B-0220B:allow soft starter and solid goods surface distance 50mm(1.97inch) 0255B~1000B:allow soft starter and solid goods surface distance 200mm(7.88inch)
3	Soft starter can be installed line by line without any gap
4	Soft starter can be installed by side.the rated current of soft starter will reducing 15%.

4.2 Control Terminal

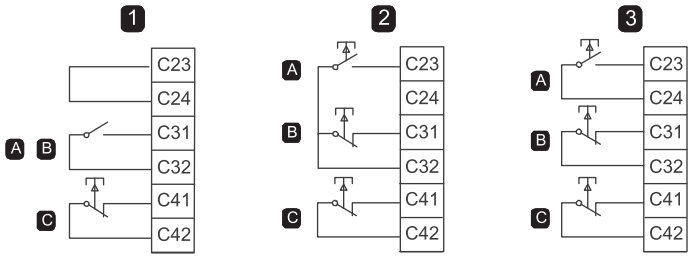


4.3 Control Voltage

- C1 (220~440 VAC) A1, A2

4.4 Control Cable

The soft starter has 3 fixed remote control input.These input shall be controlled by lower rated voltage under condition of small current.



1	Two-wire control
2	Three-wire control
3	Four-wire control
A	Start
B	Stop
C	Reset

Warming:

Do not apply voltage on control input.These input is 24VDC power supply input,must be controlled by touch point control without electricity.
Connection control input cable must separate with power supply voltage and motor cable
Reset input terminal can be always open or closed.use parameter 6M to select configurations.

4.5 Relay Output

Soft starter has 4 relay output,among them one is fixed output,the other 3 piece is PLC output.
When soft staring complete,carry out output closing(staring current is less than PLC rated current 120%),It is always keeping closing status till stopping running(soft stop or sliding stop)
Refer to 7A~7I settings to decide PLC output action

- If this output terminal use to connect main contactor,when soft starter receive order to starting,active the output terminal. In the process under control of soft starter keep active status all along.
- If this output terminal adapt to trip function,active the output terminal when tripping.
- If the output terminal adapt to indication,active the output terminal when activating specified indication.

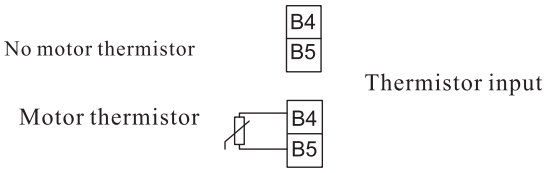
Warming:

The switching capacity of a PCB-mounted relay is not suitable for some electronic contactor coils. Consult the contactor manufacturer / supplier to confirm its capacity.

Three additional outputs on the input / output expansion card can be used.

4.6 Motor Thermistor

Connect motor thermistor with soft starter.When thermistor circuit resistor surpass 3.6kΩ or less than 20Ω ,the soft starter will trip.



Attention

If no connection between motor thermistor and soft starter,thermistor input terminal B4,B5 shall open circuit.
If B4,B5 short circuit,soft starter will trip.
Thermistor shall use shielded cable,it should be separated with ground line and other power supply circuit and control circuit on electricity.

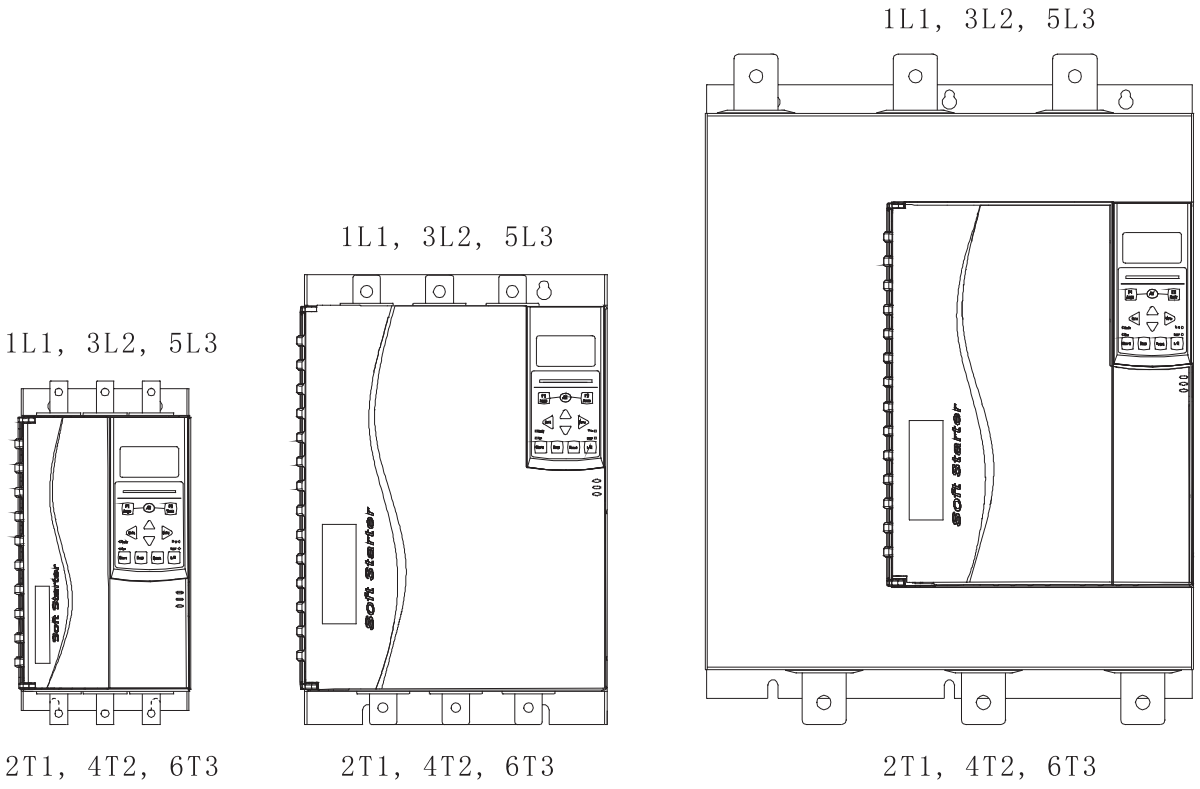
4.7 Earthing Terminal

Earth Terminal locates in back of soft starter.

- 5.5KW~55KW has a earth terminal in input terminal
- 75KW~500KW has 2 earth line terminal,one is in input terminal,the other one is charge of output terminal.

4.8 Power Supply Input And Output Configuration

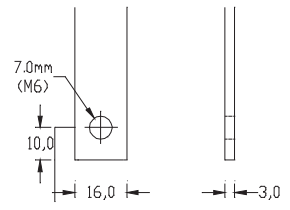
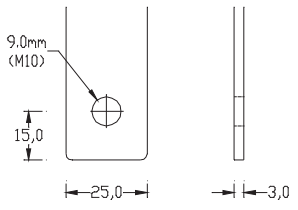
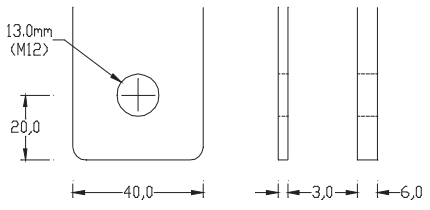
Connect AC power supply according upside in and output downside



4. 9 Power Connection

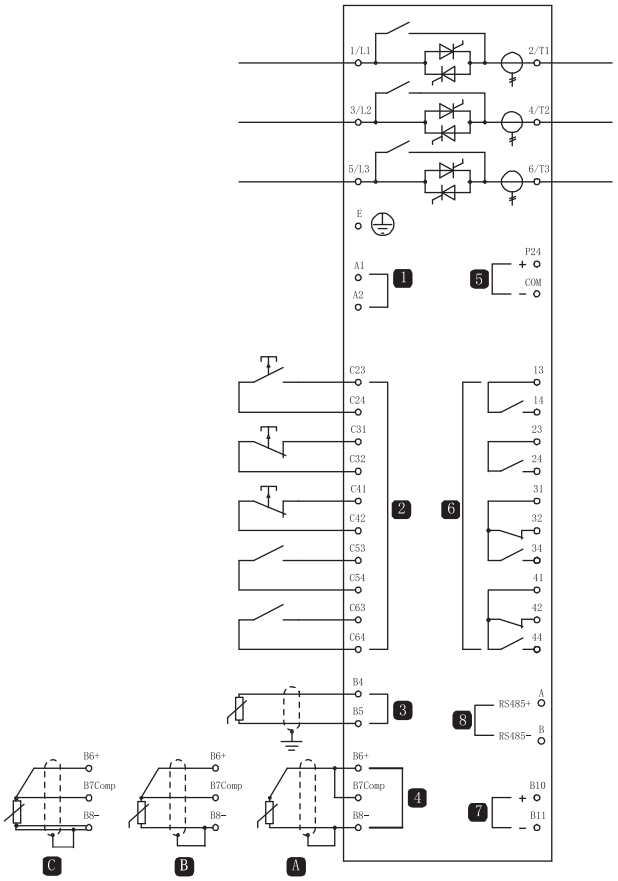
Attention
Part of soft starter use aluminum generatrix.When connect power supply,we suggest you clean surface thoroughly with appropriate adhesive to resist corrosion

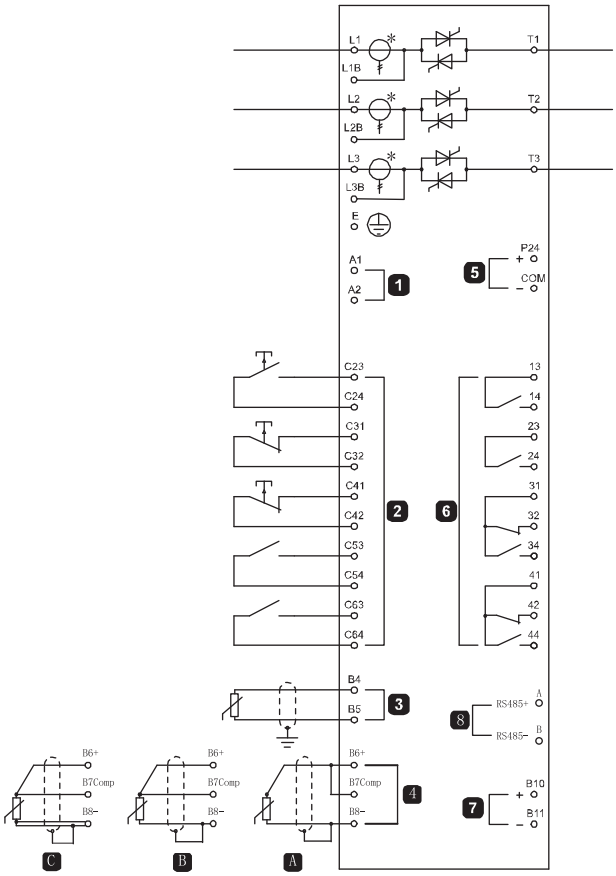
We only use copper strand conductors or solid conductor with rated temperature over 75° C

5.5KW-55KW	75KW-110KW	132KW-320KW
		

4.10 Principle Chart

Internal bypass type	No internal bypass type





1	Control voltage
2	Remote control input
3	Motor thermistor input
4A	RTD/PT100 input -2 line
4B	RTD/PT100 input -3 line
4C	RTD/PT100 input -4 line
5	24VDC output
6	Relay power
7	Model output simulation
8	RS485 communication output

C23, C24	Start
C31, C32	stop
C41, C42	Reset
C53, C54	PLC input A
C63, C64	PLC input B
13, 14	Relay output A
23, 24	Carrying relay output
31, 32, 34	Relay output B
41, 42, 44	Relay output C

Control Voltage

- (220~440 VAC) A1, A2

Attention

Soft starter current voltage and current transformer locates in output terminal at the output terminal

Chapter 5 Power Supply Circuit

5.1 Electric Motor Connection

Soft Starter can adopt Star Shape connection or triangle connection to connect motor.If we use triangle connection method, use parameter 1A input motor rated current.Soft starter automatically test motor adopt star connection method or triangle connection method for connection and calculate correct triangle connection current.

There are built-in bypass type no need to install outlay bypass contactor.

Internal bypass type:

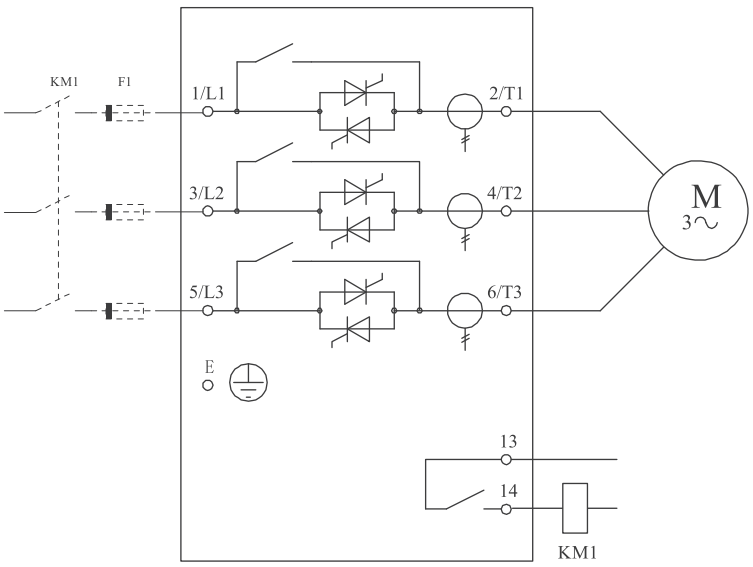
5.5kw、7.5kw、11kw、15kw、18.5kw、22kw、30kw、37kw

45kw、55kw、75kw、90kw、110kw、132kw、160kw、185kw

200kw、220kw、250kw、280kw、320kw、350kw、400kw

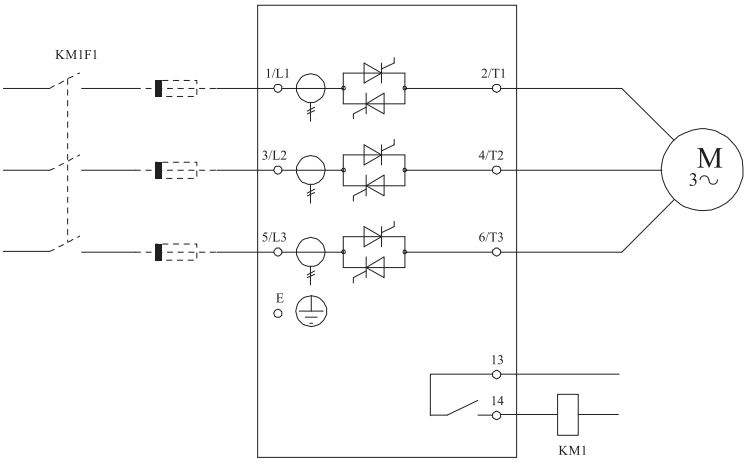
450kw、500kw

Star connection, internal bypass



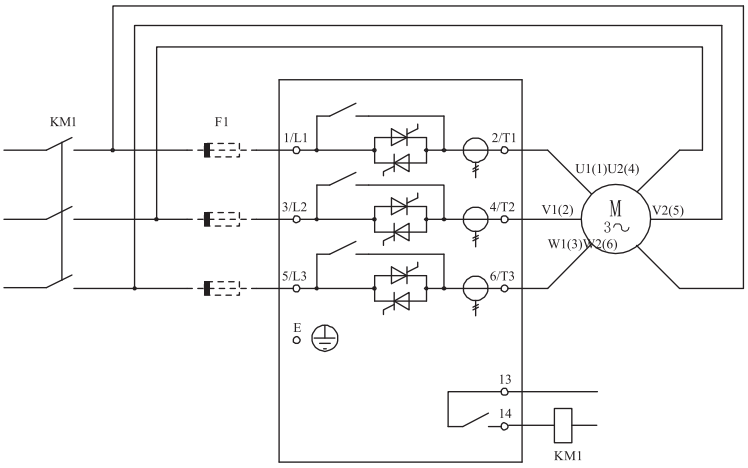
KM1	Main contactor(any selection)
F1	Semiconductor fuse (optional)

Star shape Connection method,without bypass



KM1	Main Contactor
F1	Semiconductor Fuse (optional)

Triangle shape connection method,internal bypass



KM1	Main contactor
F1	Semiconductor fuse(optional)

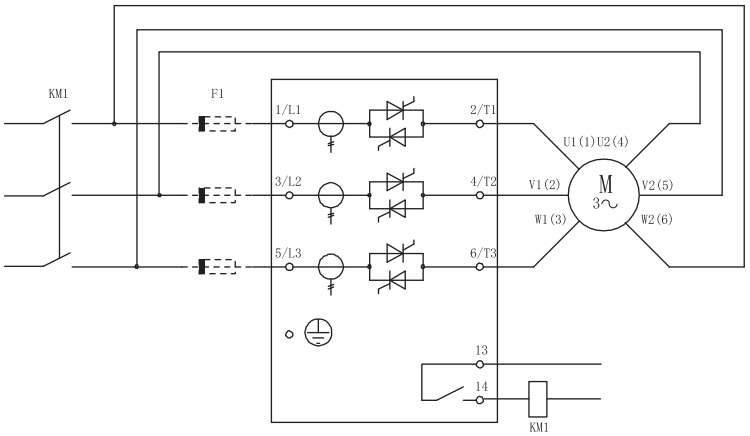
Attention

If adopting triangle connection method connect soft starter,keep install main contractor or Shunt trip circuit breaker.

Attention

If adopt triangle connection method,usd parameter 1A input motor rated current.Soft starter automatically testing motor adopting star connection method or triangle connection method,and Calculate correct triangle connection current.

Triangle connection without bypass



KM1	Main Contactor
F1	Semiconductor Fuse (optional)

5.2 Bypass Contactor

Some soft starters have built-in bypass, so it is not necessary to install external bypass contactor.

Soft starters without built-in bypass may need to be equipped with external bypass contactors. Select a contactor with AC1 rating greater than or equal to the current rating of the connected motor.

Internal bypass type:

5.5kw、7.5kw、11kw、15kw、18.5kw、22kw、30kw、37kw

45kw、55kw、75kw、90kw、110kw、132kw、160kw、185kw

200kw、220kw、250kw、280kw、320kw、350kw、400kw

450kw、500kw

5.3 Main Contactor

If the soft starter is connected to the motor by the triangle connection method, the main contactor must be installed; if the star connection method is adopted, the main contactor can be installed.

Select a contactor with AC3 rating greater than or equal to the current rating of the connected motor.

5.4 Circuit Breaker

It can use Shunt trip circuit breaker,during soft starter tripping disconnect motor circuit,no need to use main contractor

5.5 Power Factor Correction

If use power factor correction,you shall use speciafied contactor to switching capacitor

Attention

We muse connect power factor correction capacitor at input terminal of soft starter.
If we adjust capacitor at output terminal connection power factor correction of soft starter.