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Customer Service Hotline: 400-0898-188

Raynen Makes Industry More Intelligent

Raynen® 睿能
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The sample version is constantly updated with product upgrades, please pay attention to the version number
For products and solutions marked with *, please contact us for detailed information

Expert in industrial automation products and solutions

RSE Series
Low voltage soft starter

Version: V25.01

Stock Code (Raynen Technology 603933)

Raynen® 睿能

About Raynen

2007

Raynen Technology was established

Main Board Listing

Listed on the main board of Shanghai Stock Exchange in 2017
Stock Code: 603933
It is a high-tech enterprise specializing in the research and development, production, sales and service of industrial automation products.

Innovation Strength

The company is headquartered in Fuzhou, with nearly 20 subsidiaries and R&D centers in Shanghai, Wuhan, Fuzhou and Changzhou. It is a "Key High-tech Enterprise of the National Torch Program", "Fujian Provincial Enterprise Technology Center", "China Textile Machinery Industry Computerized Flat Knitting Machine Intelligent Control System Product R&D Center", "Fujian Textile Equipment Intelligent Control Enterprise Engineering Technology Research Center", etc. The company insists on driving the development of technology and products with scientific and technological innovation, and through years of accumulation, has formed a number of core technologies and patent technologies with domestic leading level.

Business Area

As a domestic technology-leading supplier of industrial automatic control products, Ruineng Technology focuses on the research of control and drive technology. After years of product and technology cultivation, it has completed the comprehensive expansion from industry-specific electronic control systems to general automation products. The company's general automation products include core products such as AC servo systems, frequency converters, programmable controllers, human-machine interfaces, and Internet of Things gateways. They are widely used in electronics, textile machinery, machine tools, printing and packaging machinery, logistics equipment, intelligent manipulators, woodworking machinery, laser processing equipment, metallurgy, petroleum, and chemical industries. It provides equipment manufacturing companies with competitive products and personalized solutions with leading technologies.

Mission and Vision

Raynen has always taken "making industry smarter" as its mission, adhering to "honest cooperation, open innovation, customer achievement, world-class intelligent industrial automation products and solutions suppliers, to achieve the common growth of enterprise value and customer value.

RSE Series Low voltage soft starter

Product summary

RSE series low voltage soft starter is a low voltage bypass type motor start-stop and protection product launched by Rui Neng based on the latest motor control theory and rich experience in industry applications. This product is rich in functions, easy to use, safe and reliable. It is an ideal replacement for motor step-down starting equipment such as star/delta conversion, auto-coupling step-down, magnetic control step-down, etc. It can be widely used in loads such as fans, water pumps, compressors, crushers, etc.

Common features

Applicable power supply

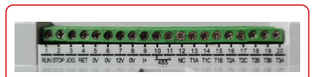
- Wide power supply range suitable for generators
- ±15% voltage fluctuation
- 50Hz or 60Hz

More convenient design

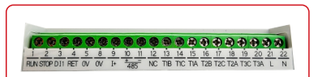
- The control terminal is located at the top of the product, which can effectively reduce the bending time of wiring personnel and protect the health of frontline workers.
- Clear and comprehensive markings can complete the electrical connection of the control circuit without the installation manual. Or you can check the control wiring through the clear front marking.

Wiring and Start

- With factory settings, RSE is ready to start
- Wiring is very simple



External bypass control terminal



Built-in/online bypass type control terminal

Low Stress/Loss

RSE intelligent Chinese display soft starter can continuously improve the running condition of the motor in the following ways:

- Adaptive soft start control technology is adopted (closed-loop adaptive control of SCR triggering according to power factor to achieve smooth torque-free oscillation starting effect, reduce stress, and extend the life of load equipment). The motor speed curve can be smooth, continuous and monotonically rising in any state without speed inflection point.
- Reduce mechanical and hydraulic stress
- Reduce the load of the distribution system (voltage peak, overcurrent)
- Limit energy loss and temperature rise, etc.

Friendly human-machine interface

- Large screen English operation panel, clear display interface, convenient for on-site operators to set up and observe.
- Chinese panel is available.
- Standard detachable operation panel, which can be installed on the control cabinet door, can be easily queried operation status information or change setting parameters without stopping the machine.

Reliable design

- Complete motor protection function

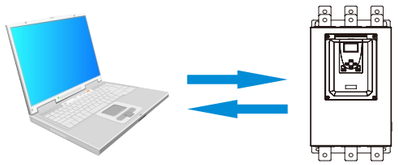
  Such as overload, overcurrent, high current, overvoltage, undervoltage, phase loss and thyristor damage, it can cope with various abnormal conditions of the power grid and load to ensure the reliable operation of the motor.

- Control panel with protective coating

  It can effectively resist dust, moisture and corrosive gases, significantly extending its service life.

Remote control and data transmission

- Standard RS485 Modbus communication port
- Communication function is used for remote control, monitoring and adjustment
- Through RS485 standard interface, it can be connected to hosts such as personal computers and PLCs
- Function code data of multiple soft starters can be written at one time, and stored



Data transfer between PC and soft starter is easier

More excellent quality

- Excellent performance, comparable to imported advanced brands in performance and quality
- The listed functions and performance indicators are carefully designed and strictly tested
- All levels of protection
- Easy to install and integrate in the control system
- Guaranteed optimal starting performance under any conditions
- Excellent electromagnetic compatibility

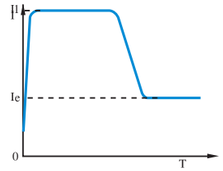
Standard and Certification

- CCC certification
- Complies with GB/T 14048.6-2016 standard

Multi-mode start

Current limited starting mode

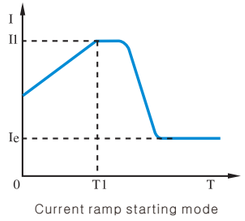
- During the starting process, keep the motor current no greater than the set current limit value
- This mode is generally used in situations where there are strict requirements for starting current limits



Current limited starting mode

Current ramp starting mode

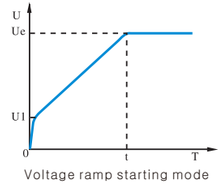
- In this mode, it has strong acceleration capability and can shorten the starting time within a certain range.
- Applicable to two-pole motors



Current ramp starting mode

Voltage ramp starting mode

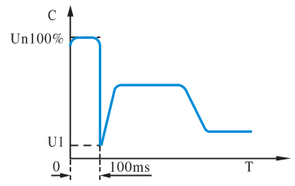
- When the motor starts in this mode, the motor current will not exceed 400% of the rated value.
- Applicable to occasions with high requirements for starting stability.



Voltage ramp starting mode

Sudden Jump starting mode

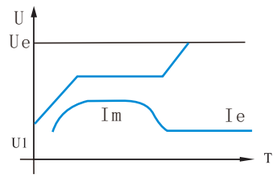
- It can overcome mechanical static friction and start the motor easily.
- After the motor starts to rotate, you can freely choose to start it in current limiting mode or voltage ramp mode.



Starting with limited current after Sudden Jump starting mode

Ramp + current limiting start mode

- The output voltage waveform will change according to the motor and load conditions.
- This starting method is mainly used for loads with small power supply capacity and requiring small starting impact.



Ramp + current limiting mode starting

Multi-industry applications

Suitable for applications such as centrifuges, air compressors, bucket wheel stackers, refrigerators, pulpers, grass cutters, belt conveyors, crushers and circulating water pumps.


Chemical

Centrifuge, air compressor, bucket wheel stacker reclaimer...

- Limits current and voltage drop during starting
- Smooth starting to prevent overstressing of the drive chain
- Independently adjusts according to load conditions


Medicine

Compressors, refrigeration machines...

- Even when the starting torque is high, smooth acceleration can be maintained until the rated speed is reached
- Reduce current peak
- Also provides protection for special motors


paper making

Pulper, grass shredder...

- Provides braking torque when stopped
- Detects overload due to blockage, detects underload


Iron and Steel Metallurgy

Steel truck, bucket wheel stacker and reclaimer...

- It can reduce a series of problems such as large mechanical and electrical shocks in traditional starting methods, which can easily cause damage to the bucket wheel coupling, high-speed shaft, reducer and other parts.


Mine mountain

Belt conveyor, crusher, circulating water pump...

- Progressive starting eliminates impact and belt slippage
- Detects faults, stalls, and underloads
- Plays a role in soft starting and soft stopping in circulating water pumps, reduces water hammer damage, and reduces transformer capacity.

Model description

RSE - T3 - XXX - X
① ② ③ ④

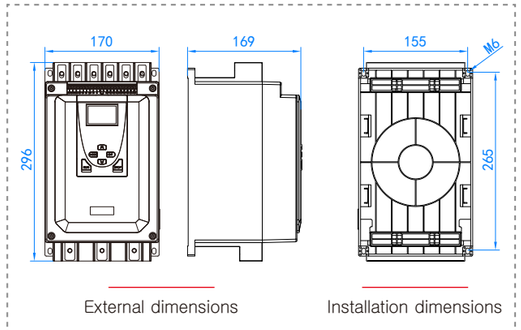
① Product Series	② Supply Voltage	③ Adapted motor power	④ Unit Bypass
RSE: Raynen Soft starter Export	S2: single-phase 220V T3: Three-phase 380V		External bypass: E Internal bypass: I Online bypass: O

Adaptive motor power (kW)	Rated output current (A)	RSE External bypass type		RSE Built-In bypass type		RSE Online bypass type	
		Soft starter Model (380V)	Dimensions Drawing No.	Soft starter Model (380V)	Dimensions Drawing No.	Soft starter Model (380V)	Dimensions Drawing No.
5.5	11	RSE-T3-5-E	A-1	RSE-T3-5-I	B-1	RSE-T3-5-O	C-1
7.5	15	RSE-T3-7-E		RSE-T3-7-I		RSE-T3-7-O	
11	23	RSE-T3-11-E		RSE-T3-11-I		RSE-T3-11-O	
15	30	RSE-T3-15-E		RSE-T3-15-I		RSE-T3-15-O	
18.5	37	RSE-T3-18-E		RSE-T3-18-I		RSE-T3-18-O	
22	45	RSE-T3-22-E		RSE-T3-22-I		RSE-T3-22-O	
30	60	RSE-T3-30-E		RSE-T3-30-I		RSE-T3-30-O	
37	75	RSE-T3-37-E		RSE-T3-37-I		RSE-T3-37-O	
45	90	RSE-T3-45-E		RSE-T3-45-I		RSE-T3-45-O	
55	110	RSE-T3-55-E		RSE-T3-55-I		RSE-T3-55-O	
75	150	RSE-T3-75-E	A-2	RSE-T3-75-I	B-2	RSE-T3-75-O	C-2
90	180	RSE-T3-90-E		RSE-T3-90-I		RSE-T3-90-O	
115	230	RSE-T3-110-E		RSE-T3-110-I		RSE-T3-110-O	
132	264	RSE-T3-132-E	A-3	RSE-T3-132-I	B-3	RSE-T3-132-O	C-3
160	320	RSE-T3-160-E		RSE-T3-160-I		RSE-T3-160-O	
185	370	RSE-T3-185-E		RSE-T3-185-I		RSE-T3-185-O	
200	400	RSE-T3-200-E		RSE-T3-200-I		RSE-T3-200-O	
250	500	RSE-T3-250-E	A-4	RSE-T3-250-I	B-4	RSE-T3-250-O	C-4
280	560	RSE-T3-280-E		RSE-T3-280-I		RSE-T3-280-O	
320	640	RSE-T3-320-E		RSE-T3-320-I		RSE-T3-320-O	
400	800	RSE-T3-400-E	A-5				
450	900	RSE-T3-450-E					
500	1000	RSE-T3-500-E					

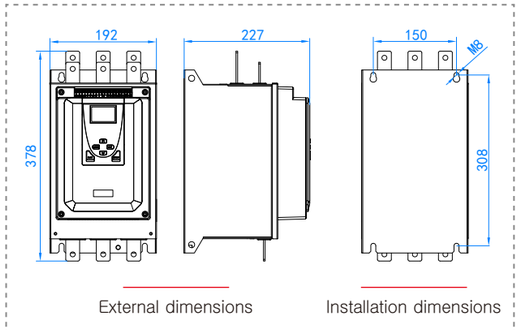
Note: For the external dimensions, installation dimensions and apertures of the RSE series products, please refer to the external dimensions drawing according to the corresponding legend numbers.

Dimensions Drawing

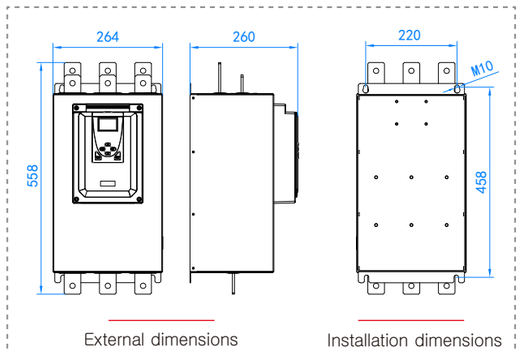
■ RSE External bypass type (RSE-E)



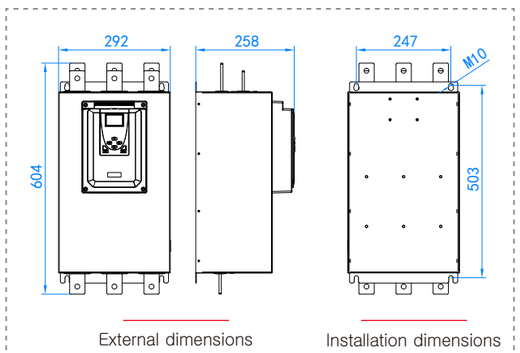
A-1 380V 5.5-55kW



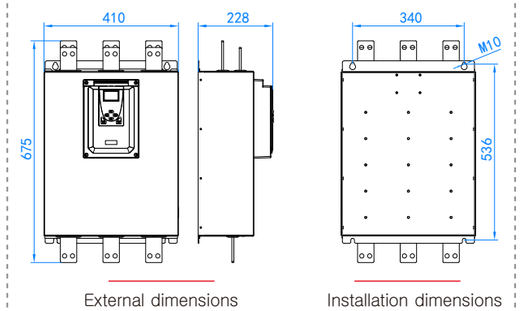
A-2 380V 75-115kW



A-3 380V 132-200kW



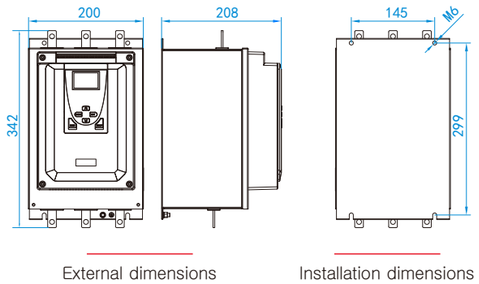
A-4 380V 250-320kW



A-5 380V 400-500kW

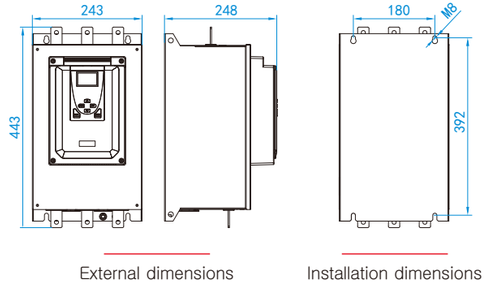
Dimensions Drawing

■ RSE Internal bypass type (RSE-I)



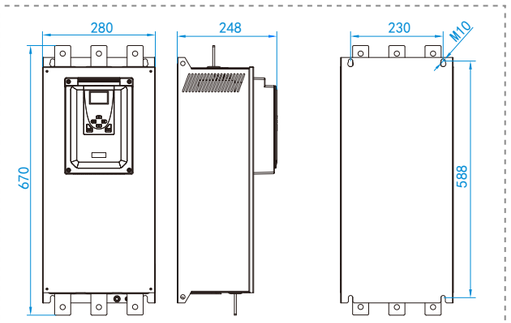
External dimensions　Installation dimensions

B-1 380V 5.5-55kW



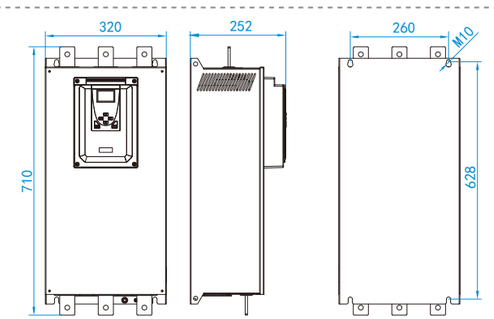
External dimensions　Installation dimensions

B-2 380V 75-115kW



External dimensions　Installation dimensions

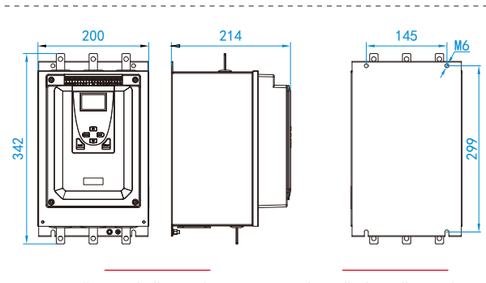
B-3 380V 132-200kW



External dimensions　Installation dimensions

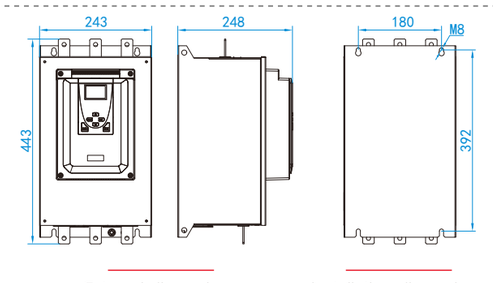
B-4 380V 250-320kW

■ RSE Online Bypass (RSE-O)



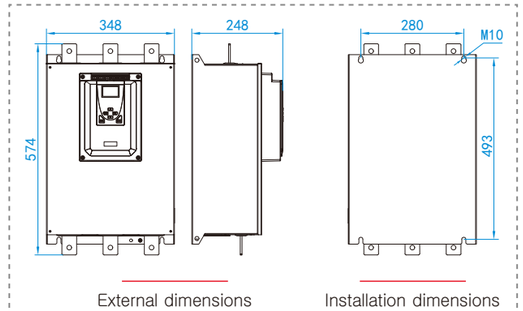
External dimensions　Installation dimensions

C-1 380V 5.5-55kW



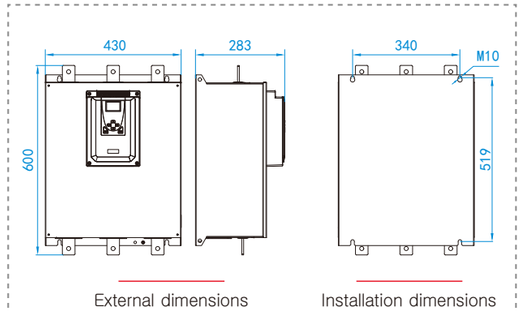
External dimensions　Installation dimensions

C-2 380V 75-115kW



External dimensions　Installation dimensions

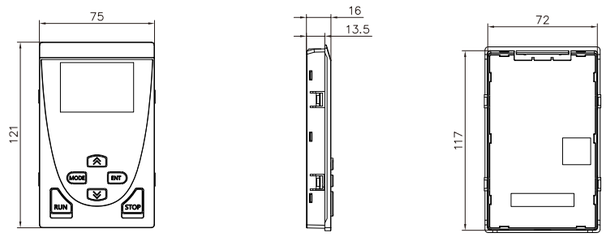
C-3 380V 132-200kW



External dimensions　Installation dimensions

C-4 380V 250-320kW

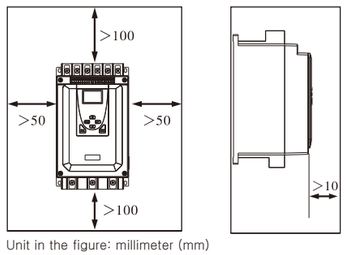
■ Panel size



Note: The recommended panel opening size is 118*72.5mm

Installation considerations

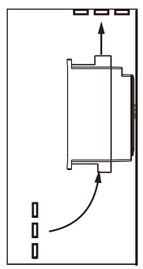
■ Installation Recommendations



Unit in the figure: millimeter (mm)

- The soft starter should be installed vertically.
- Leave enough heat dissipation space around the equipment to ensure that the air required for cooling circulates from the bottom to the top of the component.
- Do not place the RSE close to or on the heat generating components.

■ Installation in a wall-mounted or floor-standing metal enclosure



- Meet the above installation requirements
- Select cabinets with good ventilation at the top and bottom
- Install ventilation grids to ensure adequate ventilation

Performance & configuration

RSE External bypass type (RSE-E)		
Electrical Characteristics	Rated operating voltage	Three-phase 380V±15%
	Rated operating frequency	50Hz or 60Hz (please specify in advance before ordering)
	Number of controlled phases	3
	Applicable motor	Squirrel cage three-phase induction motor/asynchronous motor
	Starting frequency	Depending on the load conditions, it is recommended to start and stop no more than 10 times per hour under normal conditions, and 6 times per hour under heavy load
	Starting mode	Voltage ramp, current ramp, current limit, inching, voltage ramp + current limit, sudden jump + voltage ramp
	Stop mode	Free stop, soft stop
	Protection function	Phase loss protection, overcurrent protection, overload protection, current imbalance protection, overheating protection, start timeout protection, etc.
Environmental Characteristics	Operating temperature	-10℃ ~ 40℃ (40℃ ~ 60℃ need to reduce capacity)
	Storage temperature	-25℃ ~ 70℃
	Relative humidity	95% no condensation or dripping
	Altitude	Below 1000m (1000~3000m need to reduce capacity)
	Cooling method	Natural air cooling
	Installation method	Wall-mounted
	Other	No flammable, explosive, corrosive gas, no conductive dust or metal powder
Standard and Certification	Implementation standards	GB/T 14048.6
	Certification	CCC

RSE Built-In/Online bypass type (RSE-I/RSE-O)		
Electrical Characteristics	Rated control power supply	Single-phase 220VAC±15%, 50/60Hz
	Rated power supply voltage	Three-phase 380V~480V (-10%~+15%)
	Rated power supply frequency	50Hz or 60Hz
	Number of controlled phases	3
	Applicable motor	Squirrel cage three-phase induction motor/asynchronous motor
	Starting frequency	Depends on the load conditions. It is recommended to start and stop no more than 10 times per hour under normal conditions and 6 times per hour under heavy load
	Starting mode	Voltage ramp, current ramp, current limit, inching, voltage ramp + current limit, sudden jump + voltage ramp
	Stop mode	Free stop, soft stop
	Protection function	Phase loss protection, overcurrent protection, overload protection, current imbalance protection, overheating protection, start timeout protection, undervoltage/overvoltage protection, start overfrequency protection, high current protection, thyristor breakdown protection, power reverse sequence protection, wiring error protection, etc.
Environmental Characteristics	Operating temperature	-10℃ ~ 40℃ (40℃ ~ 60℃ need to reduce capacity)
	Storage temperature	-25℃ ~ 70℃
	Relative humidity	95% no condensation or dripping
	Altitude	Below 1000m (1000~3000m need to reduce capacity)
	Cooling method	RSE-I: 55kW and below: natural cooling; 75kW and above: forced air cooling RSE-O: forced air cooling
	Installation method	Wall-mounted
	Other	No flammable, explosive, or corrosive gases, no conductive dust or metal powder
Standard and Certification	Implementation standards	GB/T 14048.6
	Certification	CCC

Characteristics of each bypass type of RSE series

RSE External bypass type (RSE-E)

Small size and low cost

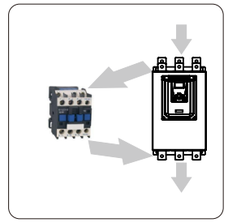
After starting, switch to bypass contactor, low energy consumption

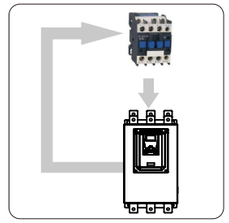
High reliability

Easy maintenance in the future

Direct connection for simplified wiring

- Complete motor protection function
- No matter where the contactor is located in the cabinet, it can be easily wired





RSE Internal bypass type (RSE-I)

Energy consumption lower

High comprehensive cost performance

Password protection

Independent control power supply (220VAC), parameter setting is possible even without power supply (380V)

Supports internal motor connection, suitable for larger size motors

Without any other external equipment, one internal soft starter can realize all functions such as soft start, operation, soft start, etc.

- Cost saving: no need to purchase additional bypass contactors and bypass cables
- Time saving: only 6 power cables need to be connected, RST, UVW, and wiring is simple and convenient
- Space saving: no external bypass contactors, and the overall space required is small

Start-up adaptive control technology

The triggering of SCR is controlled in a closed loop according to the power factor to achieve a smooth torque-free oscillation starting effect, reduce stress and extend the life of the load equipment.

RSE Online Bypass (RSE-O)

Independent control power supply (220VAC), parameter setting is possible even without power supply (380V)

After the bypass contactor is removed, there is no limit on the mechanical life of the contactor contacts, and the service life is longer.

Compatible with external contactors, more flexible to use and suitable for a wider range of applications

Can drive non-traditional motor loads such as motor heaters, resistive loads and transformer loads

It can perfectly replace solid-state contactors and additionally provide soft start and soft stop functions

Supports internal motor connection, suitable for larger size motors

Without any other external equipment, one internal soft starter can realize all functions such as soft start, operation, soft start, etc.

- Cost saving: no need to purchase additional bypass contactors and bypass cables
- Time saving: only 6 power cables need to be connected, RST, UVW, and wiring is simple and convenient
- Space saving: no bypass contactor inside or outside, and the overall space required is small

No bypass contactor required

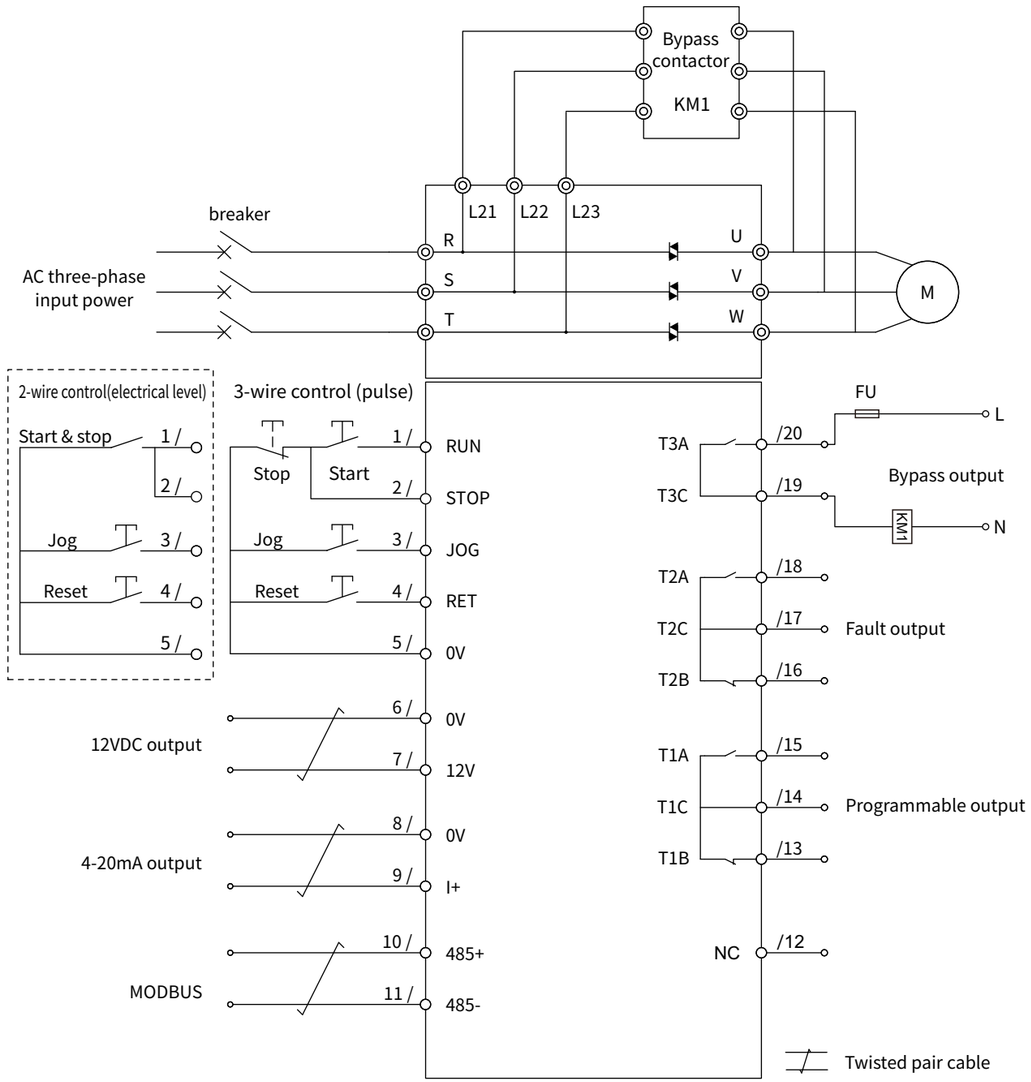
It completely avoids possible damage to the contactor contacts caused by vibration and dust, which is advantageous in harsh applications with strong vibration or high dust and dirt.

Start-up adaptive control technology

The triggering of SCR is controlled in a closed loop according to the power factor to achieve a smooth torque-free oscillation starting effect, reduce stress and extend the life of the load equipment.

*For other features of online bypass, please refer to the Built-In bypass soft starter.

RSE Series – External bypass standard wiring diagram



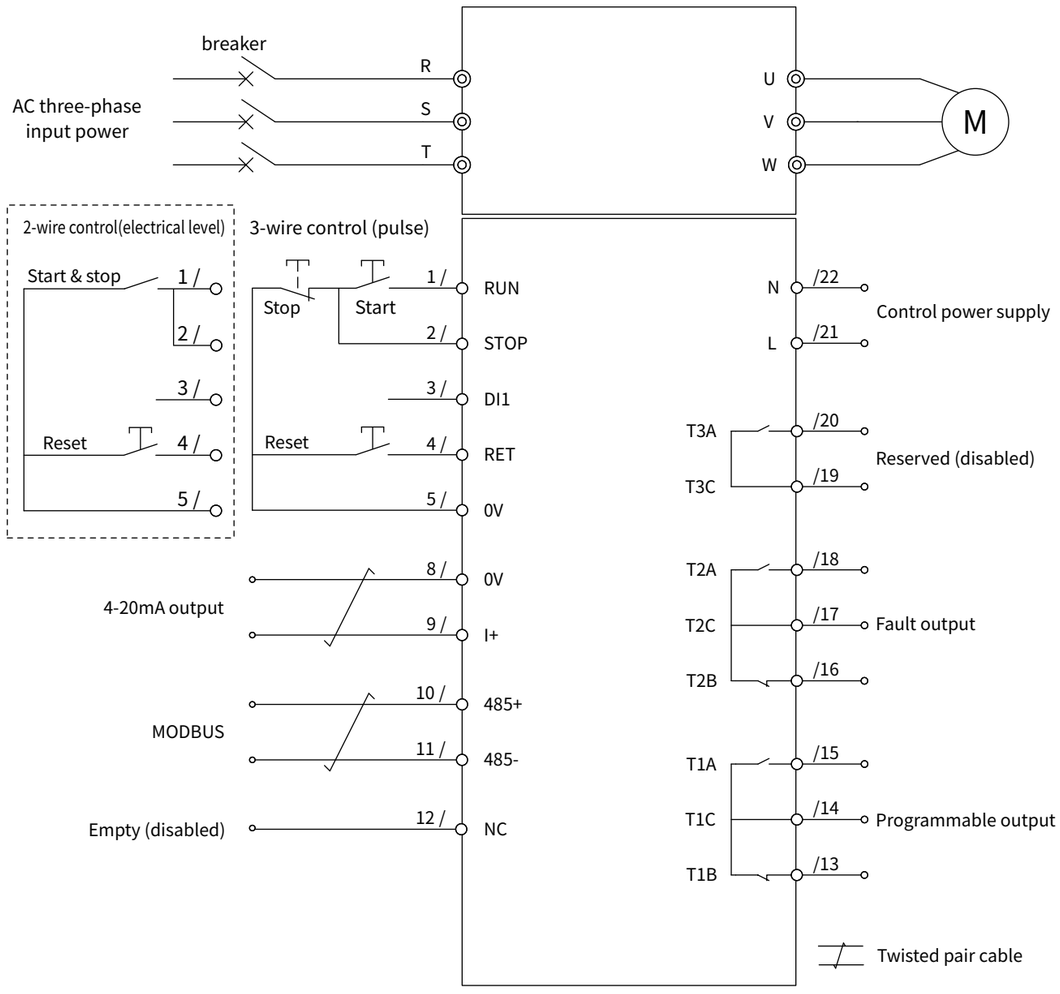
Be sure to pay attention to the following instructions when wiring:

<1> The power supply must be connected to the main circuit power supply terminals R, S, and T without phase sequence requirements. If the power supply is connected incorrectly, the soft starter will be damaged;

<2> The input and output ends of the bypass contactor must ensure the same phase sequence.

RSE External bypass type (RSE-E) terminal description	
R、S、T	Power input terminal, connect to three-phase AC power: 380V, 50/60Hz
U、V、W	Power output terminal, connect three-phase induction motor/asynchronous motor
L21、L22、L23	Bypass dedicated terminal, connected to bypass contactor
1/ RUN	External control start terminal: ◇ In two-wire control, RUN and 0V are short-circuited to start externally, and RUN and 0V are disconnected to stop externally; ◇ In three-wire control, RUN and 0V are short-circuited (pulse) to start externally.
2/ STOP	External control stop terminal: In three-wire control, disconnecting STOP from 0V can achieve external control shutdown.
3/ JOG	External control jog terminal: When jogging, short-circuiting JOG and 0V can realize jog control.
4/ RET	External control reset terminal: Short-circuiting RET with 0V can achieve fault reset.
5/ 0V	Control common terminal: Control terminal circuit power reference point.
6/ 0V 7/ 12V	DC 12V output: DC power output: 12V, 100mA.
8/ 0V 9/ I+	DC 4-20mA output: DC current output: 4-20mA, ≤400Ω, 20mA corresponds to 2 times the rated current of the motor. $I_{Motor}=I_{Motor\ Rating}*\ (I_{4-20mA}-4)\ /\ 8$。
10/ 485+ 11/ 485-	Modbus RTU communication: RS485+: A, RS485-: B
12/ NC	Empty terminal: no function
13/ T1B 14/ T1C 15/ T1A	Programmable relays: T1A-T1C: Normally open contact, 5A@250VAV, 5A@30VDC T1B-T1C: Normally closed contact, 3A@250VAV, 3A@30VDC
16/ T2B 17/ T2C 18/ T2A	Fault relay: T2A-T2C: Normally open contact, 5A@250VAV, 5A@30VDC T2B-T2C: Normally closed contact, 3A@250VAV, 3A@30VDC
19/ T3C 20/ T3A	Bypass relay: T3A-T3C: Normally open contact, 8A@250VAV

RSE Series – Built-In/Online bypass type standard wiring diagram



Be sure to pay attention to the following instructions when wiring:

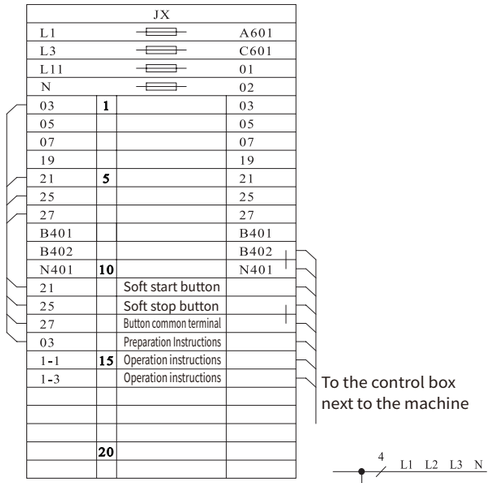
<1> The power supply must be connected to the main circuit power supply terminals R, S, and T without phase sequence requirements. If the power supply is connected incorrectly, the soft starter will be damaged;

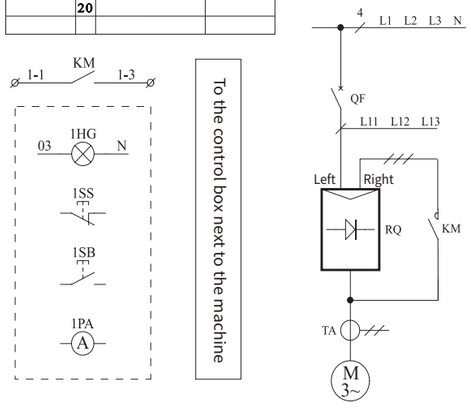
<2> T3A and T3C are reserved terminals and are prohibited from being used externally.

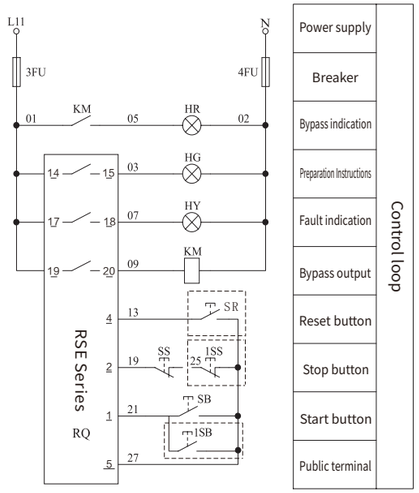
RSE Built-In/Online bypass type (RSE-I/RSE-O) terminal description	
R、S、T	Power input terminal, connect to three-phase AC power: (380~480)V, 50/60Hz
U、V、W	Power output terminal, connect three-phase induction motor/asynchronous motor
1/ RUN 2/ STOP	RUN: external control start terminal; STOP: external control stop terminal; The STOP terminal function can be set through parameter C09 to select different shutdown wiring methods; Two-wire control: RUN and STOP can be externally controlled to start when they are short-circuited with 0V at the same time; RUN and STOP can be externally controlled to stop when they are disconnected with 0V at the same time; Three-wire control: In the case of normal STOP and 0V short-circuit: RUN and 0V short-circuit (pulse) can be externally controlled to start; STOP and 0V disconnect (pulse) can be externally controlled to stop. Note: When U090 is V1.10 and above, the STOP terminal in two-wire control can be left floating (not short-circuited with RUN)
3/ DI1	Editable logic input terminal: The function of terminal DI1 can be set to emergency stop or jog through parameter C06.
4/ RET	External control reset terminal: Short-circuiting RET with 0V can achieve fault reset.
5/ 0V	Control common terminal: Control terminal circuit power reference point.
8/ 0V 9/ I+	DC 4-20mA output: DC current output: 4-20mA, ≤400Ω, 20mA corresponds to 2 times the rated current of the motor (can be selected through C07). $I_{Motor}=I_{Motor\ Rating}*\ (I_{4-20mA}-4)\ /\ 8$。
10/ 485+ 11/ 485-	Modbus RTU communication: RS485+: A, RS485-: B
12/ NC	Empty terminal: no function
13/ T1B 14/ T1C 15/ T1A	Programmable relays: T1A-T1C: Normally open contact, 5A@250VAV, 5A@30VDC T1B-T1C: Normally closed contact, 3A@250VAV, 3A@30VDC
16/ T2B 17/ T2C 18/ T2A	Fault relay: T2A-T2C: Normally open contact, 5A@250VAV, 5A@30VDC T2B-T2C: Normally closed contact, 3A@250VAV, 3A@30VDC
19/ T3C 20/ T3A	Reserved: Internal bypass relay control contacts, disabled.
21/ L 22/ N	Control power supply: Connect to single-phase 220VAC, 50/60Hz.

RSE Series – External bypass type electrical schematic diagram

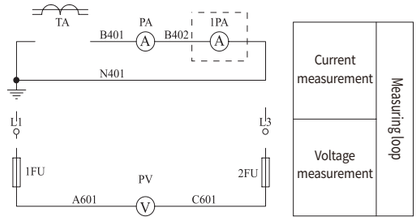
3-wire system schematic diagram







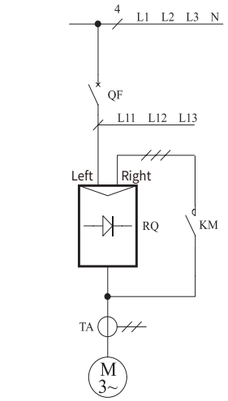
Note: 8/9 are 4-20mA analog output terminals
10/11 are Modbus communication terminals

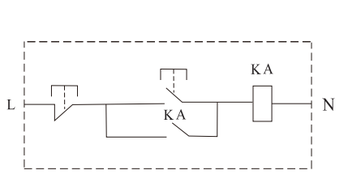


Illustrate

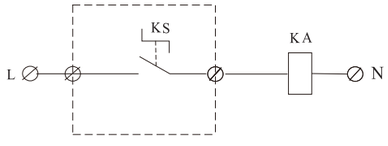
- This figure is the electrical schematic diagram of a one-to-one ordinary motor control cabinet (three-wire system).
- In the six-input line of the soft starter, R, S, and T are connected to the circuit breaker, and L21, L22, and L23 are connected to the bypass contactor.
- There are 2 meters (PA, PV), 3 buttons (SB, SS, SR), and 3 indicator lights (HG, HR, HY) on the control cabinet panel.
- The motor can be started only when the ready indicator light is on.
- The user can choose whether to install the components in the dotted box.

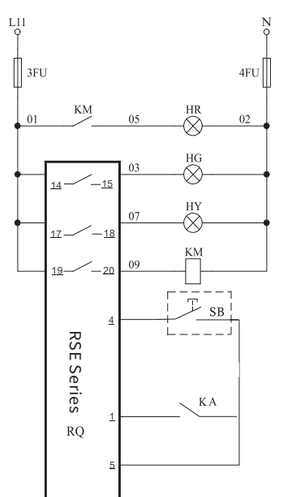
2-wire system schematic diagram



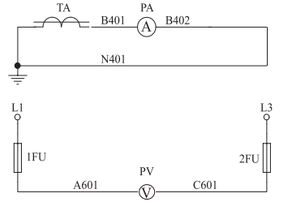


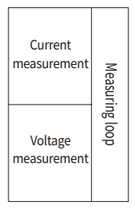
Or





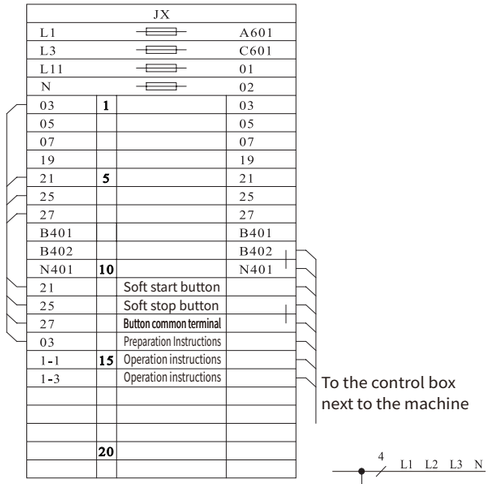
Note: 8/9 are 4-20mA analog output terminals
10/11 are Modbus communication terminals

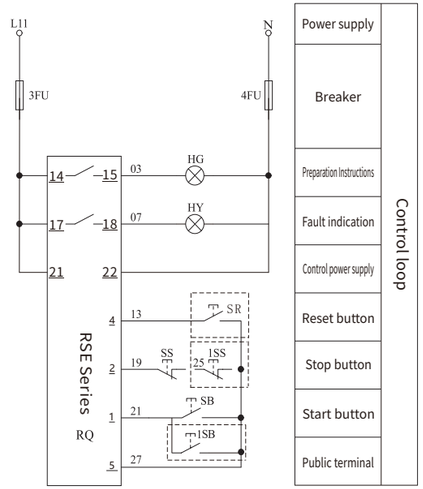




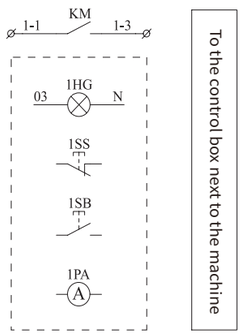
RSE Series – Built-In/Online bypass type electrical schematics

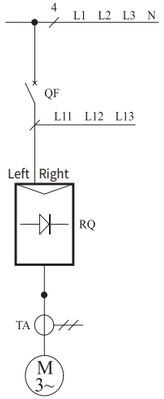
3-wire system schematic diagram

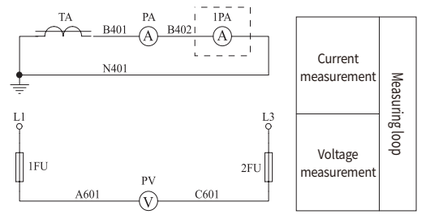




Note: 8/9 are 4-20mA analog output terminals
10/11 are Modbus communication terminals



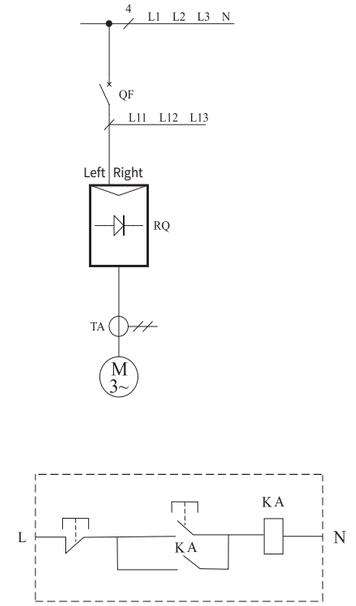


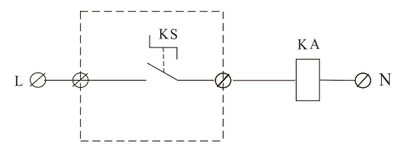


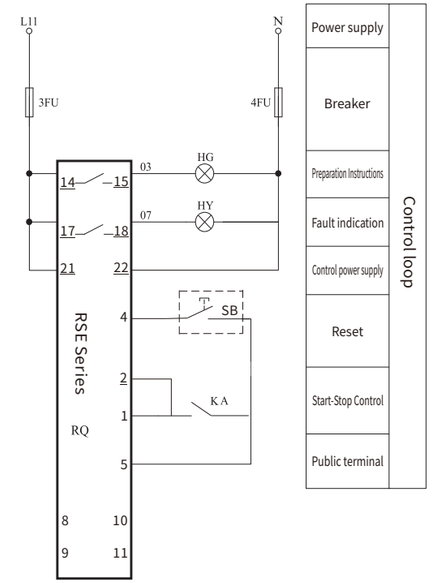
Illustrate

- This figure is the electrical schematic diagram of a one-to-one ordinary motor control cabinet (three-wire system).
- There are 2 meters (PA, PV), 3 buttons (SB, SS, SR) and 3 indicator lights (HG, HR, HY) on the control cabinet panel.
- The motor can be started only when the ready indicator light is on.
- The user can choose whether to install the components in the dotted box.

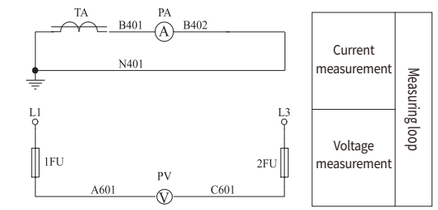
2-wire system schematic diagram







Note: 8/9 are 4-20mA analog output terminals
10/11 are Modbus communication terminals



Illustrate

- When U090 is V1.10 or above, the soft starter's terminal 2 (STOP) can be left floating (not short-circuited with terminal 1 RUN).