

# SJR3-L Series Motor Soft Starter

## Selection Guide



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## SAFESAV

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## Product Description



The L series soft starter is a soft starter developed by our company based on the latest product architecture platform (development code "Leopard") that supports multiple bypass types.

Compared with the platform of the previous generation SJR2 series, the "Leopard" architecture has been greatly optimized and improved in software and hardware.

Based on the latest 32-bit ARM architecture main control chip, the algorithm performance and functions are further improved.

The high-frequency optocoupler-triggered thyristor design replaces the traditional analog pulse drive which effectively improves the internal conduction efficiency of the thyristor and reduces loss. The built-in power supply design enables the product to adapt to wide voltage fluctuations.

The product also has linear temperature detection adjustable three-phase unbalance tolerance and overload tolerance design, so that it can better adapt to the harsh production environment.

## Technical Reference

Standards compliant	GB/T 14048.6-2016/IEC 60947-4-2:2011
Three phase power	(AC) 380V±15%/220V±15%/660V±15%
Frequency	50Hz/60Hz
Applicable motors	Squirrel cage three-phase asynchronous motor
Start frequency	Depending on the load, no more than 20 times per hour are recommended
Impact resistance	15gms
Seismic ability	The vibration force is below 0.5G with the altitude below 3000m.
Ambient temperature	No derating is needed with the operating temperature between -10and +40Between +40 °C ~+60 °C, for every 1°C increase, the current decreases by 1.2% )
Storage temperature	-25°C ~+70 °C
Environment humidity	95% No condensation or water droplets
Maximum working height	No derating within 1000 meters (above 1000 meters, the current is reduced by 0.5% for every additional 100 meters)
Relative to vertical	The maximum working angle of the installation location is not required

## Model Interpretation

**SJR3 - LN 075 TM1 - 4 N**

①                      ②                      ③                      ④                      ⑤ ⑥

①	Model	SJR3 series soft starter
②	Type	LE : External bypass LB : Built-in bypass LN : <b>SCR Online without bypass</b> LD : Bypass inside Delta LX : Enhanced Hybrid Bypass
③	Rated power	005~1000 : 5.5~1000kW
④	Frame No.	The corresponding dimensions of the frame number refer to the appendix. Due to different product technology iterations and different adaptation scenarios, products of the same power may be adapted to different casings. The specific size should be based on the casing number on the order code.
⑤	Mains voltage class	2 : AC220V-240V 4 : AC380V-440V 6 : AC660V-690V E : AC1140V
⑥	Control voltage level	N : Internal control voltage (default) D2 : External control voltage DC24V W2 : External control voltage AC220V W4 : External control voltage AC380V

## Protection and Operation Functions

- Soft start overheat protection
- Current limit mode start
- Input phase loss protection
- Voltage ramp start
- Output phase loss protection
- Soft stop
- Three-phase unbalance protection
- Coast to stop
- Starting overcurrent protection
- Programmable relay output
- Run overload protection
- Fault relay output
- Low Power supply voltage protection
- 4~20mA DC analog output
- Power over voltage protection
- RS485 communication I/O
- Underload protection (anti-dry burning)
- User password and run lock

## Product Model

Motor rated power ( kW ) +10% to -15%		Max. allowable current	Soft starter rated current	Soft starter model
220V	400V	Class 10 application ( A )	ICL rated current ( A )	
4	7.5	17	15	L(1*)-7R5
5.5	11	22	21	L(1*)-011
7.5	15	32	29	L(1*)-015
9	18.5	38	35	L(1*)-018
11	22	47	42	L(1*)-022
15	30	62	57	L(1*)-030
18.5	37	75	69	L(1*)-037
22	45	88	81	L(1*)-045
30	55	110	100	L(1*)-055
37	75	140	131	L(1*)-075
45	90	170	162	L(1*)-090
55	110	210	195	L(1*)-110
75	132	250	233	L(1*)-132
90	160	320	285	L(1*)-160
110	220	410	388	L(1*)-220
132	250	480	437	L(1*)-250
160	315	590	560	L(1*)-315
-	355	660	605	L(1*)-355
220	400	790	675	L(1*)-400
250	500	1000	855	L(1*)-500
355	630	1200	1045	L(1*)-630

1: Based on bypass type, the above table is applicable for model LN, LE, LB and LX, but not for LD. Please refer to the model descriptions for more details.

2: The above values are given when the maximum ambient temperature of 40°C and the operating environment below 1000m above sea level. The design rated derating caused by high temperature and high altitude should be considered when selecting models.

3: The rated current of the adapted motor cannot exceed the maximum allowable current for Class 10 applications.

## Heavy Load Applications

Motor rated power ( kW ) +10% to -15%		Max. allowable current	Soft starter rated current	Soft starter model
220V	400V	Class 20 application ( A )	ICL rated current ( A )	
3	5.5	12	15	L(1*)-7R5
4	7.5	17	21	L(1*)-011
5.5	11	22	29	L(1*)-015
7.5	15	32	35	L(1*)-018
9	18.5	38	42	L(1*)-022
11	22	47	57	L(1*)-030
15	30	62	69	L(1*)-037
18.5	37	75	81	L(1*)-045
22	45	88	100	L(1*)-055
30	55	110	131	L(1*)-075
37	75	140	162	L(1*)-090
45	90	170	195	L(1*)-110
55	110	210	233	L(1*)-132
75	132	250	285	L(1*)-160
90	160	320	388	L(1*)-220
110	220	410	437	L(1*)-250
132	250	480	560	L(1*)-315
160	315	590	605	L(1*)-355
-	355	660	675	L(1*)-400
220	400	790	855	L(1*)-500
250	500	1000	1045	L(1*)-630

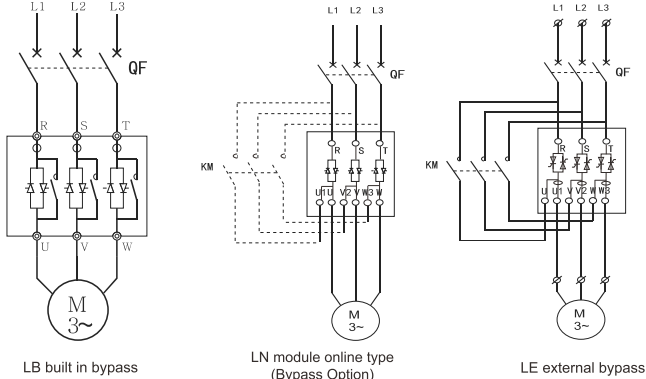
1: Based on bypass type, the above table is applicable for model LN, LE, LB and LX, but not for LD. Please refer to the model descriptions for more details.

2: The above values are reference values given according to the maximum ambient temperature of 40°C and the operating environment below 1000m above sea level. The design rated derating caused by high temperature and high altitude should be considered when selecting models.

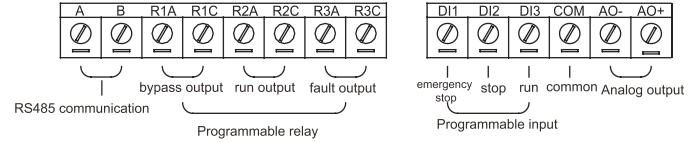
3: The rated current of the adapted motor cannot exceed the maximum allowable current for Class 20 applications

# Wiring Diagram

## Basic wiring diagram

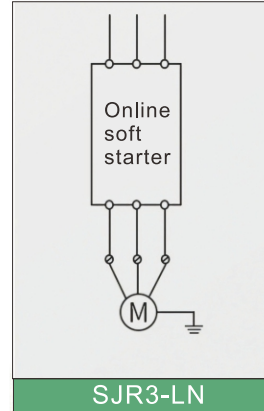
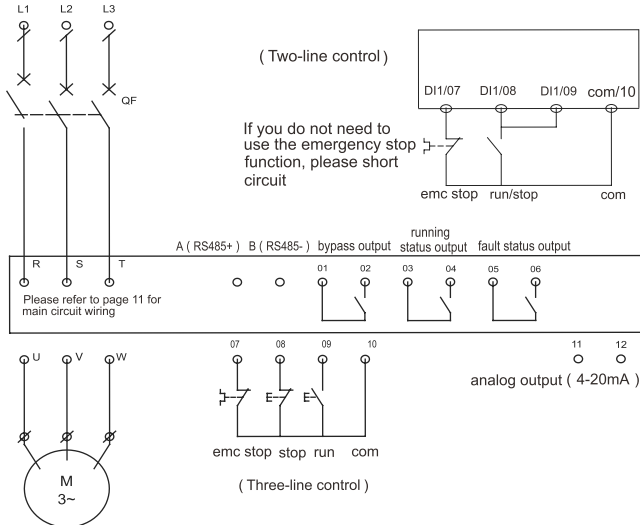


# Control Terminal Connection



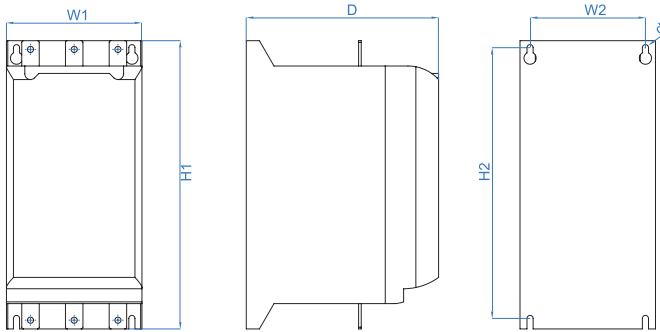
The terminal functions marked in the above figure are only the default settings, and the actual functions can be changed by parameter setting

## Standard application wiring diagram



SJR3-LN

## Dimension

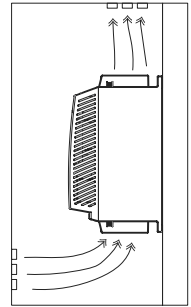
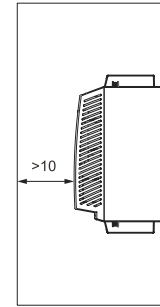
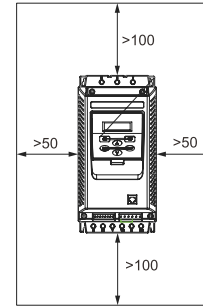


Suitable model	Shell frame No.	Outer dimensions			Mounting dimensions		
		H1	W1	D	H2	W2	Φ
LN	GS1	330	155	195	298	95	M6
LN/LE	TM1	370	210	260	343	150	M8
LN/LE	TL1	380	320	300	350	250	M8
LN/LE	TXL	560	395	317	523	300	M8
LN/LE	TXXL	810	610	391	770	400	M12
LE/LB	SS1	313	155	187	296	128	M6
LE	SM1	407	270	245	352	237	M8
LE	SL1	461	300	265	393	263	M8
LB	SM2	513	270	245	481	237	M8
LE	GS2	273	145	165	250	135	M6
LN	GS3	270	160	205	250	145	M6
LB	BSTU	340	200	240	320	160	M6
LN	TKL	560	395	317	523	300	M8
LB	BSTW	398	327	260	370	250	M8
LB	SL2	620	300	270	575	265	M6

## External Design



- △Double ball fans
- △Strong heat dissipation
- △Waterproof and dustproof design

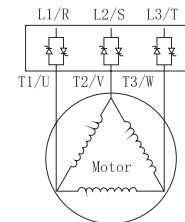


The soft starter (230–400V) is connected to the delta winding of the motor, in series with each winding.

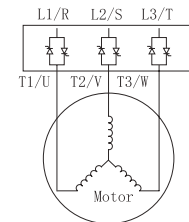
The soft starter can be connected in series to the delta winding of the motor. They are driven by a current of  $1/\sqrt{3}$  wire current, which allows the use of underrated starters.

Example: a motor of 400V-110kW, line current 195A (rated current for delta connection). The current in each winding is equal to  $195/1.7$ , that is 114A.

Select the maximum allowable current rating that is slightly larger than this current, i.e. 140A as the rating (SJR3-075 is used for standard applications).



direct delta connection



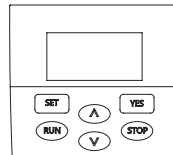
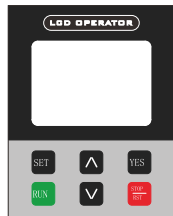
direct star connection

## Key Board

key name	The main function
RUN	Display <b>[Ready]</b> Press this key to start, and display <b>[Startup]</b>
STOP	When it is running normally, it will display <b>[Running]</b> , press this key to stop, and it will display <b>[Soft Stop]</b> when it is in a soft stop. This key has the function of resetting the fault state.
SET	Press this key to enter the menu setting, and press it again to exit the menu interface.
YES	In the setting menu interface, press this key to modify the parameters, the display arrow points to the code setting line. After modifying the parameters, press this key to save, meaning the data has been saved.
△ ▽	Enter the menu setting, enter the code setting line, and press the button to modify the parameters. During operation, this button can observe the grid voltage, radiator temperature, and historical faults during operation.

△ The advantages of on-line (without bypass) soft starters are:

The external contactor is saved, the economic cost of the entire cabinet is reduced, and greatly reduces the space requirement, which is very suitable for occasions with high space requirements.



## Examples of Applicable Industries



compressor



sewage treatment



Crusher



blender



Injection molding machine



Forging machine

*In the selection of functions, our SJR3 product line also takes into account the different needs of our customers. At the same time, we also mentioned some other series specifications, such as the LB series with built-in bypass and the LE series with external bypass, etc.*

*Welcome to contact us for more details with the contact information enclosed with this catalogue!*