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SSD1 Model
Motor Soft Starter

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SSD1 series

Motor Soft Starter

Product Description

SSD1 series intelligent soft starter adopts international advanced electronics technology, microprocessor technology and modern control theory to efficiently limit start voltage of asynchronous motor. The equipment could be widely applied to fan, pump, conveyor and compressor and other heavy load equipment. It is an excellent product to neplace traditional startup equipments such as star/triangle transition, self-coupling voltage reduction, magnetron voltage reduction and so on.

Technical Characteristics

- Parameter setting adopts Tree-menu management for easy checking & modification.
- Dynamic fault record function which is convenient for seeking the reason of fault;
- Over current, three-phase current imbalance, overheat, phase loss and motor overload protection;
- BYOD standard Modbus communication protocol;
- Reasonable structure design to make installation easier and use more convenient; Terminals are plug-type, easy for wiring.
- Combined both drive board and main board into one, lowering the cost and easy for operation.
- Executive Standards: GB14048.6-2008 and IEC

Typical Application

SSD1 series intelligent soft starter could be widely applied to electric power, metallurgy, petroleum, petrochemical, mining, chemical industry, construction, building materials, municipal project, arm industry, light industry, textile, printing and dyeing, paper industry, and pharmacy and so on.

- Pump: make use of soft stop function to relieve the influence of water hammer so as to save system maintenance cost.
- Ball mill: make use of voltage ramp startup to reduce gear torque friction so as to save cost and time.
- Fan: reduce belt friction and mechanical conflict to save maintenance cost.
- Compressor: make use of current limitation function to realize smooth startup so as to reduce motor heating and prolong its service life.
- Conveyor: make use of soft start to realize smooth and gradual startup process in order to avoid product move and liquid overflow.

Technical Features

- Main loop work voltage: AC380（+10%−15%）;
- Main loop work current: 40A～1200A;
- Main loop frequency: 50Hz/60Hz（±2%）;
- Control loop power supply: 110−220V±15%(0.5A)AC/DC;
- Soft starting rising time: 1～120S;
- Soft stop time: 0～60S;
- Current limiting times: 1.5～5.0Ie;
- Initial voltage: 25%～80%Ue;
- Cooling method: natural cooling;
- Communication method: RS485 series communication;
- Starting times≤10/h

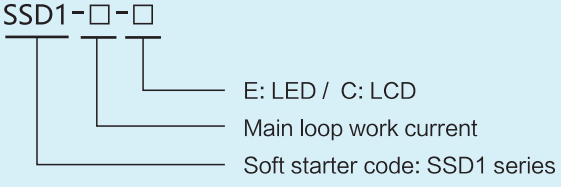
Usage and Environment Standard

Protection class	IP00
Vibration resistance	comply with IEC 68−2−6: 2 Hz to 13Hz is 1.5mm peak value; 13 Hz to 200Hz is 1gn
Impact resistance	comply with IEC 68−2−27: 15g, 11ms
Maximum ambient pollution class	Class 3, comply with IEC 947−4−2
Maximum relative humidity	93% no condensing or drip. Comply with IEC 68−2−3
Ambient temperature	Storage: −25℃ to +70℃ Running: 10℃ to +40℃ without derating. Maximum +60℃, when temperature above 40℃, the current will reduce by 2% for temperature rising per 1℃.
Maximum running altitude	2000m without derating (above 2000m, current will reduce by 0.5% for altitude rising per 100m)
Running position	vertical position，between ±10°

Relationship between Altitude and Output Rating Ratio

Altitude	Output current rating ratio
Below 2000m	1.00
2000m−2500m	0.91
2500m−3000m	0.88

Instruction for Product Model

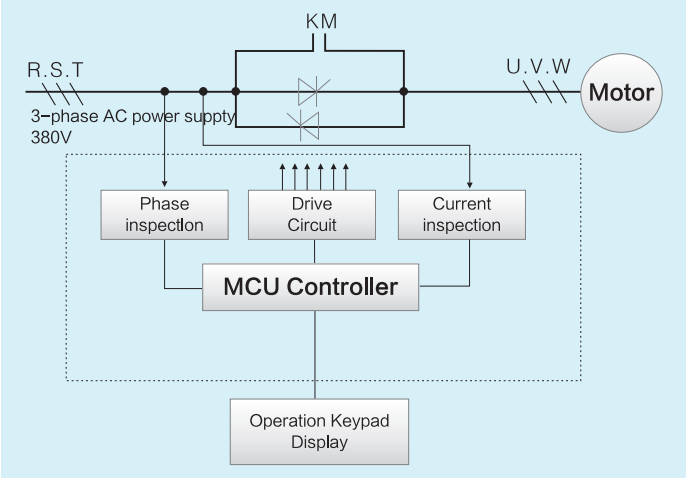


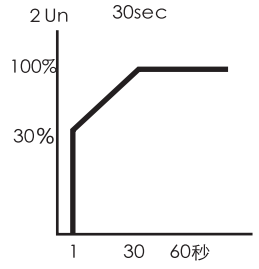
Notice for Model Selection

- Soft starter must supply bigger torque than load resistance torque to complete start of related equipments such as pump, centrifugal pump. Single start constant load: permitted 40s for startup under 3 times limited current; permitted 25s for startup under 4 times limited current.
- Recycle start: if starting motor 10 times every hour, permitted 25s for startup under 3 times limited current; and permitted 15s for startup under 4 times limited current. Now the correspondent heat protection level is class 10.
- Permit to start heavy load motor such as ball mill, fan 5 times every hour. If limited current value is as above, the protection level is class 20. If increasing startup frequency, we have to adopt bigger power level product.

Working principal

Main circuit of SSD1 soft starter adopts 6 SCRs (anti-parallel connected in series) to connect with stator circuit of AC motor. Based on function of SCR electronic switch, the soft starter makes use of microprocessor to adjust trigger angle to change SCR's conducting angle, so as to change motor input voltage value to realize the control of motor soft start. When completing the start, the output of soft starter will reach rated voltage. Then contactor KM which controls three-phase bypass will switch on to make motor run into the grid.

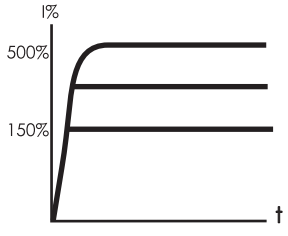




Voltage Mode

It is used to determine the initial motor torque.(When the frequency is a constant value, motor torque is proportional to the square of the applied voltage.)

Setup range: 30% -80% . When adjusting the parameter, the user has to consider current impact and mechanical impact. If the value is too big, it will lead to a very big initial current. And then current impact and mechanic impact will be too much more. Under voltage mode, current will change with the exact load. But if maximum value is limited to 5 times of rated current, the user could increase start time to reduce its start current. When the load is light or empty, it will also complete start process even though it does not reach setup rising time because of motor potential energy which has accelerated the establishment.



Limit Current Start

Maximum Permitted Current during motor start.

Setup range: 150-500 % FLA(motor rated current). If asking for an extending range, please contact the manufacturer. If the setup value is too big, the motor will get bigger current from the main circuit to accelerate its speed. If the setup value is too small, it will cause that the motor still could not reach the full speed after completing its acceleration process. In order to help start current quickly reach limited value, it's better to setup start time short.

Motor and system protection functions:

SSD1 series soft starter provides many protections upon motor and soft starter. The main functions are as below:

1. Protection for three-phase input phase failure. It won't start unless there is load with power supply from main loop and three phases.
2. Protection for overheat. Monitor the temperature. Frequent starts will lead to too high SCR's temperature. (Over 80° C)
3. Protection for overlong start time. It is not good for motor and soft starter if start time is too long. So the default limit for start time is 30s. And the user could set up this time between 10~300s in accordance with exact load.
4. Protection for big current belongs to timing limit. If the current is over 5~8 times (available for setup), it will cut off output within 20ms ~2s (available for setup).
5. Protection for inverse overload. There are 4 grade curves stall protection.
6. Light load alarm; trip protection.
7. Frequency mistake alarm.

Product Specification

SSD1 Soft Starter 380V(+10%~15%)50/60Hz(±2%)			
Structural model	Product Model	Rated Current Ie(A)	Applicable Motor Rated Power(kW)
M1	SSD1-40-E/C	40	22
	SSD1-54-E/C	54	30
	SSD1-68-E/C	68	37
	SSD1-80-E/C	80	45
	SSD1-100-E/C	100	55
M2	SSD1-135-E/C	135	75
	SSD1-160-E/C	160	90
	SSD1-200-E/C	200	115
	SSD1-250-E/C	250	132
	SSD1-300-E/C	300	160
M3	SSD1-360-E/C	360	200
	SSD1-500-E/C	500	250
	SSD1-640-E/C	640	320
M4	SSD1-800-E/C	800	400
	SSD1-1000-E/C	1000	500
	SSD1-1200-E/C	1200	600

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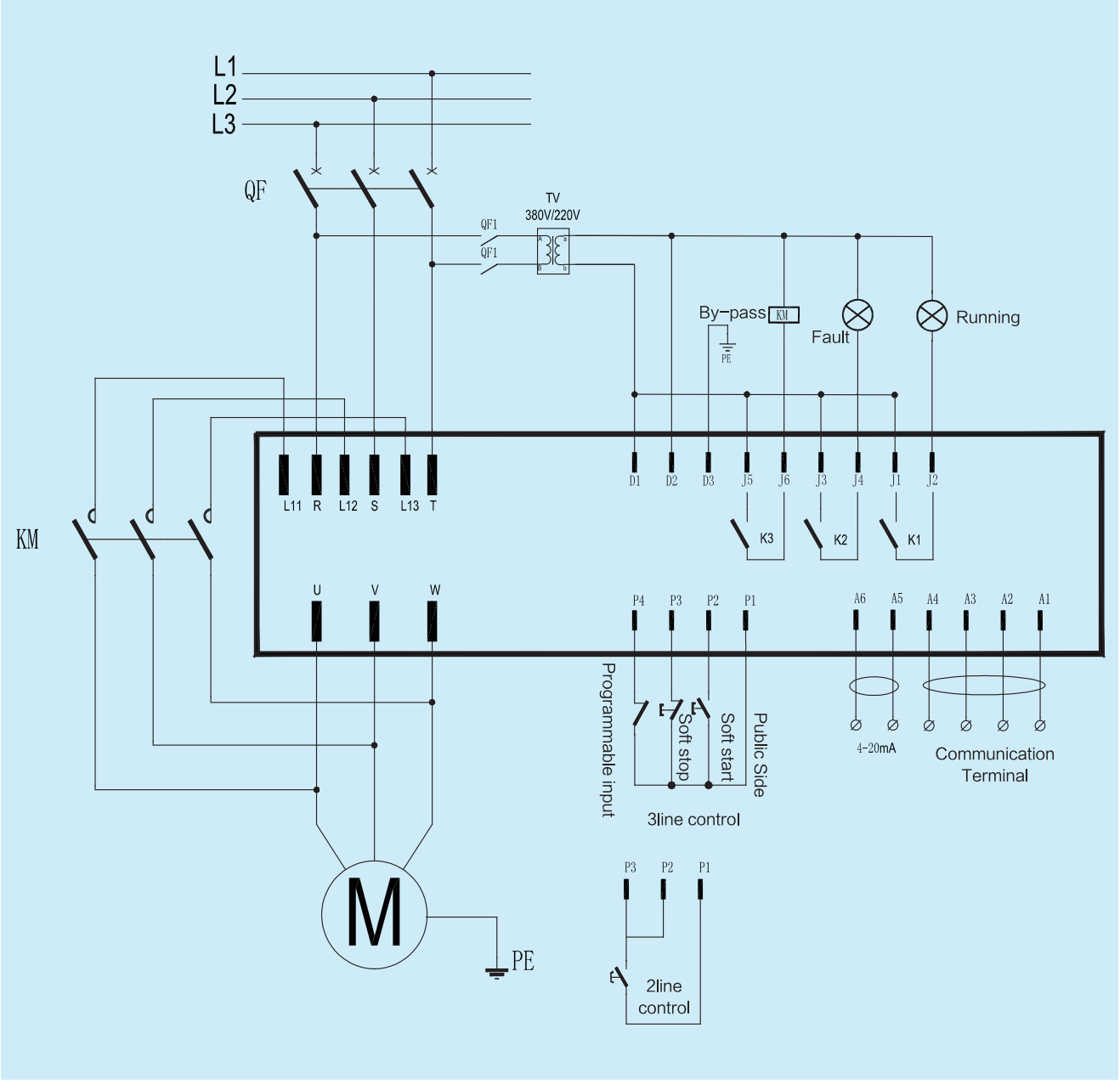
4. Permit to start heavy load motor such as ball mill, fan 5 times every hour. If limited current value is as above, the pro-tection level is class 20. If increasing startup frequency, we have to adopt bigger power level product.

Outside Wiring Drawing



Instruction:

1. Main loop wiring: Terminal R-S-T connect power supply; Terminal U-V-W connect motor
2. Control power supply wiring: it connects control power supply terminal D1 and D2.
3. Ground wiring: it connects power supply terminal D3.
4. K3 controls bypass contactor. K2 is for fault output, K1 is for running output. They are pass contacts.
5. Start and stop loop wiring: Follow circuit diagram to connect control loop terminals P1, P2, P3.
6. P4 is programmable input terminal.
7. A5 and A6 are 4-20mA analogue signal output terminals.
8. A1, A2, A3, and A4 are RS485 communication terminals.

Secondary Wiring Drawing