



P_r 5200 Series

High-quality Soft starter



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Powtran technology, as a national high-tech enterprise based in Shenzhen and Dalian as the center, establish more than 30 offices and the radiation of R & D, production, logistics and service network in the whole of China. Composing the advanced technology from Japan Toshiba and Taiwan, we provide customers with automation and energy-saving products such as frequency inverter (with special power), soft starters, AC servo drive systems, motor energy Saver, electric vehicle motor drive system etc. Our products were tested through by National Authorities and Provincial scientific and technological achievements and exported to more than 100 countries and regions.

In 1984 Dalian Motor Factory cooperated with Japan's Toshiba Corp and imported and produced frequency inverter in China. In 1995 Powtran Technology got ISO9000 (Version 94) approved as the first specialized inverter manufacturers and got CE and TUV approved in 1997. In 2004 Powtran Technology got ISO9001:2000 and approved by American ABS. In 2006, Independent research and development of the PI7000 series inverter was selected to be the significant new items of "National Torch Plan". We were the undertaker of "Eleventh Five-years Plan", the National High Technology Research and Development Program ("863" Program—Energy saving and new power vehicle motor). Commitment to the State Development and Reform Commission in 2008, "Ten Key Energy Conservation Projects" central expanding domestic demand. In 2009, Powtran was approved to be Innovation Fund project unit by Ministry of Science. In 2010 Powtran 863 project subject issue was approved by experts division. In 2011 Powtran Technology successful registered trademark of "POWTRAN" in many countries and won the "2010 Top Ten Most strength supplier in the field of low voltage inverter" title. In 2012 Powtran motor energy Saver was listed as recommended products. In 2013 Powtran Technology PI9000 series products won an award of credible quality product from China Electrical Equipment Industrial Association.

POWTRAN Technology will continue to develop high-tech electric and electronic products, promote the industrialization process of the national industry, become well-known brand of the world's electric drive field.

POWTRAN Technology – provide a comprehensive solution for the field of motor control.



- State-level high-tech enterprises
- POWTRAN Provincial famous trademarks
- The first Chinese inverter manufacturer attended continuously Hannover Messe in Germany from 2004
- Established unit of Provincial electric drive and engineering technology center
- Vice chairman of the frequency inverter branch of China Electrical Equipment Industrial Association
- Vice chairman of the special committee of energy-saving appliances of China Electrotechnical Society
- Vice chairman of Shenzhen Electric Energy Saving Research
- Core enterprise of saving and new energy vehicle demonstration in Dalian
- Corporate credit rating of AAA units
- Top 10 brands of frequency inverter in China
- Outstanding Project Award of China Hi-Tech Fair achievements

YEAR	Honor and the development process
2013	POWTRAN Technology PI9000 series products won an award of credible quality product from China Electrical Equipment Industrial Association.
2012	POWTRAN Technology Electrical and environmental protection and energy saving are listed as energy saving recommended products, the top 10 domestic frequency inverter brands.
2011	POWTRAN Technology "POWTRAN" trademarks is successfully registered in many countries, and won the title of the 2010 top ten most tender strength low-voltage inverter supplier.
2010	POWTRAN Technology 863 projects subject passed the expert group acceptance, The Core technology products obtain the "software product registration certificate" POWTRAN Technology obtain the automated marketing Decade dual award.
2009	"PI7000HEV electric vehicle motor drive system obtain the Ministry of Science and Technology", SME Technology Innovation Fund projects, launched "PI8000/8100 series of vector control inverter, won national high-tech enterprise", recognized POWTRAN Liaoning Province famous mark, construct Dalian "new energy R & D Center".
2008	Commitment to the ten major energy conservation project "of the National Development and Reform Commission, the formation of Liaoning Province electric drive engineering technology research center", "the PI7600 electromagnetism stirrer dedicated power obtain the Dalian Municipal Science and Technology Progress Award, promote the "PI7600, 7800 high-performance inverter".
2007	Energy-saving new PS7000 series motors environmental energy-saving device, PI7900 electromagnetism stirrer dedicated power, PSDA700/800 servo products get through inspection of the authority of the State and provincial science and technology achievement appraisal.
2006	Product is listed as national "Torch Plan" project important new products, the National Eleventh Five-Year Plan 863 "energy-saving and new energy vehicle" project undertaking enterprise.
2005	7-Series drives get through the national authority verification and identification of provincial scientific technological achievements, the American Bureau of Shipping ABS certification.
2004	Get through the ISO9001 quality system certification.
2001	Dalian POWTRAN Technology Co., Ltd., State-level high-tech enterprises, enjoy the right to import and export.
1997	Obtain the TÜV German security certification and EU CE certification.
1995	Get through firstly in the ISO9000 (94 Edition) quality system certification of China.

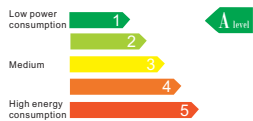
Product Overview:

PR5200 series intelligent motor soft starter is the integration of motor control theory, proprietary motor protection technology and advanced software technology, new equipment, is the ideal alternatives of early starting on motor star / delta conversion, auto buck magnetron drop pressure starting equipment; its performance currently in the market is that majority without adopting smart start ordinary soft-start control technology can not compete.

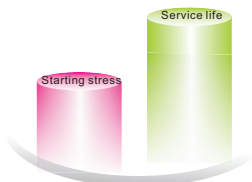


1 Reduce energy consumption	2 Improve performance	3 Soft-stop function
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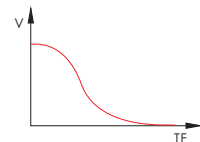
Reduce the starting current of the motor, can reduce distribution capacity, avoid investment in power grid capacity increase.



Reducing the starting stress of the motor and load equipment, extend the life of the motor and related equipment.

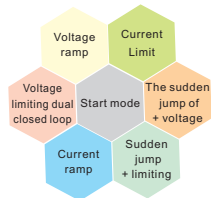


Soft-stop function effectively solve the parking surge of the inertial system; that the traditional starting equipment can not be achieved.



4 Multi-mode start	5 Reliable protection	6 Intelligence applications
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With six unique start mode: to adapt to the complexity of the motor and load, to achieve the perfect start effect.



With comprehensive and reliable protection function; effective protection of the safe use of the motor and related production equipment.



Motor soft starter intelligent network technology applied to the motor control technology to adapt to the higher demands of the rapid development of electric power automation technology.

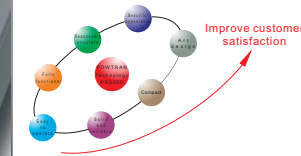


Product Features:

PR5200	1 Perfect user-friendly design	2 Reliable quality assurance
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Beautiful appearance and reasonable structure, harmony and unity.
Fully functional and easy to operate harmony and unity.
Solid and reliable and compact structure, harmony and unity.
Industrial products, excellence in artistic design.



Adopting computer simulation design. SMT production process.
Excellent electromagnetic compatibility. High-temperature aging, vibration test, before the machine leave the factory.



3 Comprehensive and reliable protection function	4 independent intellectual property rights	5 Quick and thoughtful after-sales service
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Loss of overvoltage, undervoltage, overvoltage protection.
The soft-start overheating, motor underload, start time is too long protection.
The input phase loss, output phase, three-phase unbalance protection.
Start overcurrent, running overload, load short-circuit protection.



Design patents.
Independent software copyright.
Proprietary motor starting and protection technology.
Unique testing and debugging equipment and processes.



Laid the basis for quality service and reliable performance and quality.
Provide excellent and perfect matching design.
Timely and thoughtful advice.
Continuously improve product performance based on user comments.



Nameplate Description:

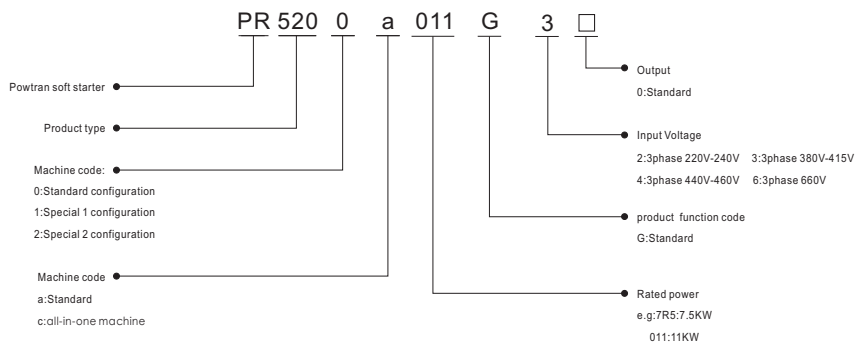
- Soft starter model →
- Output rating →
- Input rating →
- Output specifications →
- Bar Code →
- Serial No. →
- Manufacturer address →

MODEL:	PR5200 5R5G3
POWER:	5.5kW
INPUT:	AC 3PH 380V±10% 50Hz/60Hz
OUTPUT:	AC 3PH 0-380V 11A 0-400Hz

ZPB1A0100001

DALIAN POWTRAN TECHNOLOGY CO.,LTD.

Model Code:

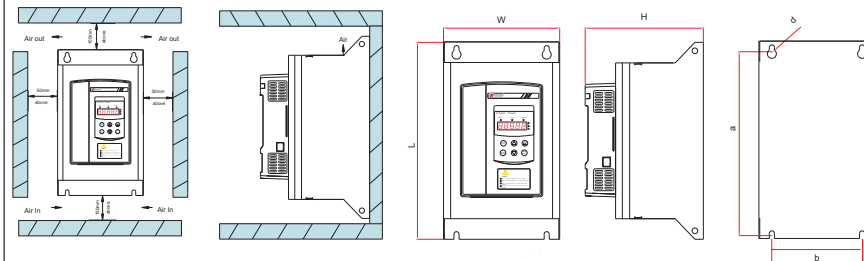


Service Conditions:

No.	item	specification
1	Power supply	Electricity, self-power station, diesel generating sets three-phase ac 380 V or 660 V ± 15%, frequency 50 Hz or 60 Hz, the power supply capacity must meet the soft starter to motor startup requirements
2	Applicable motor	Squirrel-cage three-phase asynchronous motor, motor rated power should match soft starter rated power
3	Start frequency	No demands, depending on the specific load
4	Cooling way	Natural cold wind
5	Protection grade	IP20.
6	Environmental conditions	Under Elevation 3000 meters, the environment temperature between -25 ℃~+40 ℃, relative humidity below 90% RH, no condensation, no inflammable, explosive, corrosive gas, no electrical conductivity dust, indoor ventilation is good, the vibration is less than 0.5 G place

★ Note: we can offer special conditions use of products, such as the explosion proof type, low temperature, high pressure type of soft starter, its use conditions will be further instructions

Installation Standard:

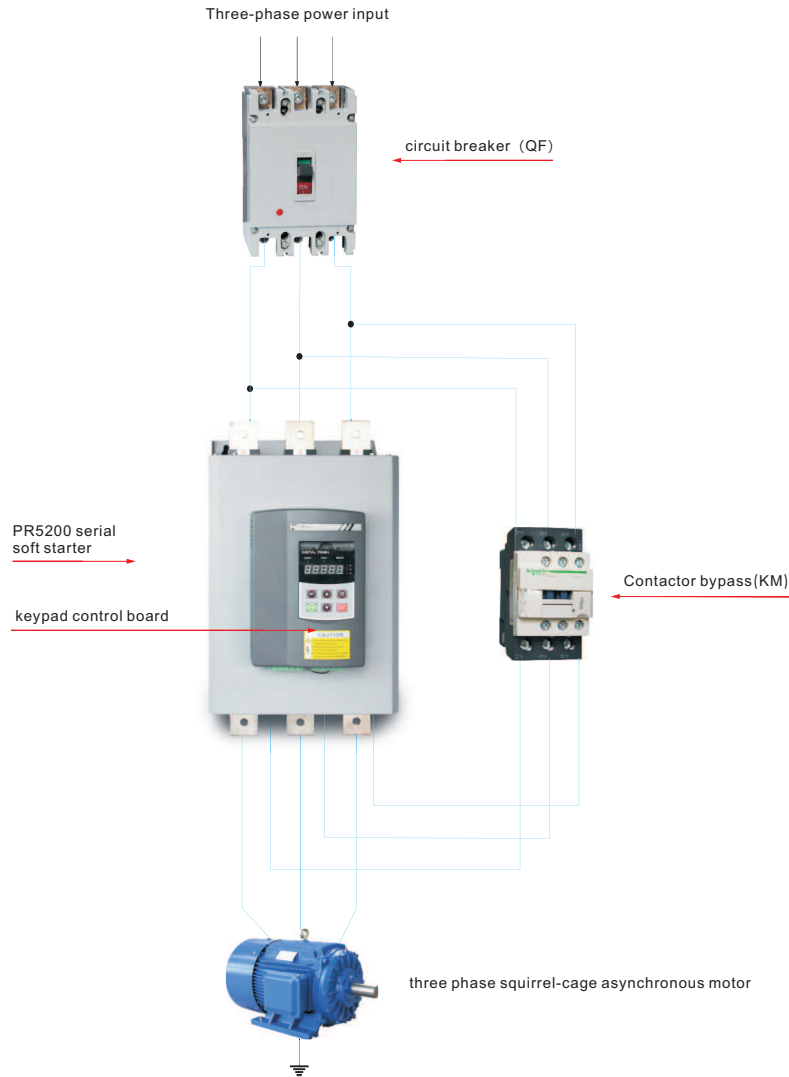


Installation Size:

(380V)

product Specification	Rated Power (kW)	Rated Current (A)	Dimension			Installation Dimension			N.W. (kg)
			L	W	H	a	b	d	
PR5200 5R5G3	5.5	11	288	146	159	270	115	∅ 8	<3.5
PR5200 7R5G3	7.5	15	288	146	159	270	115	∅ 8	<3.5
PR5200 011G3	011	23	288	146	159	270	115	∅ 8	<3.5
PR5200 015G3	015	30	288	146	159	270	115	∅ 8	<3.5
PR5200 018G3	18.5	37	288	146	159	270	115	∅ 8	<3.5
PR5200 022G3	022	44	288	146	159	270	115	∅ 8	<3.5
PR5200 030G3	030	60	288	146	159	270	115	∅ 8	<3.5
PR5200 037G3	037	74	288	146	159	270	115	∅ 8	<3.5
PR5200 045G3	045	90	288	146	159	270	115	∅ 8	<3.5
PR5200 055G3	055	110	288	146	159	270	115	∅ 8	<3.5
PR5200 075G3	075	150	350	206	210	330	160	∅ 8	<20
PR5200 090G3	090	180	350	206	210	330	160	∅ 9	<20
PR5200 115G3	115	230	350	206	210	330	160	∅ 9	<20
PR5200 132G3	132	264	420	256	250	400	210	∅ 9	<23
PR5200 160G3	160	320	420	256	250	400	210	∅ 9	<23
PR5200 185G3	185	370	420	256	250	400	210	∅ 9	<23
PR5200 200G3	200	400	420	256	250	400	210	∅ 9	<23
PR5200 250G3	250	500	490	360	290	465	290	∅ 9	<31
PR5200 280G3	280	560	490	360	290	465	290	∅ 9	<31
PR5200 320G3	320	640	490	360	290	465	290	∅ 9	<31
PR5200 400G3	400	800	490	360	290	465	290	∅ 9	<31

Wiring:



★ Note: six output copper platoon, the front three connect with motor, and the last three connect with the bypass contactor.

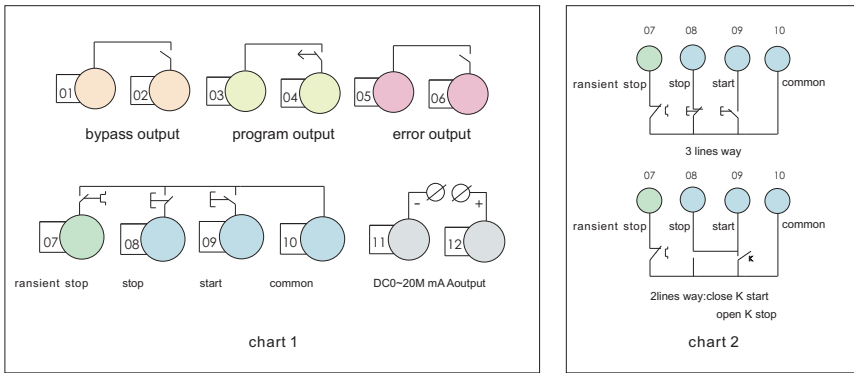
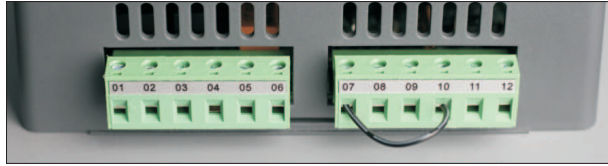
Peripheral Equipment and Options:

Reference list of PR5200 series soft starter peripheral accessories specifications

Soft Start Model	Rated Power (KW)	Rated Current (A)	Supporting the circuit breaker model number (QF)	Supporting the bypass contact model number (KM)	cable Specification	Remarks
PR5200 5R5G3	5.5	11	CM1-63L/16	LC1 D25	2.5mm ² cable	The rated power and rated current refers to the soft starter maximum ratings
PR5200 7R5G3	7.5	15	CM1-63L/20	LC1 D25	4mm ² cable	
PR5200 011G3	11	22	CM1-63L/32	LC1 D38	6mm ² cable	
PR5200 015G3	15	30	CM1-63L/40	LC1 D50	10mm ² cable	
PR5200 018G3	18.5	37	CM1-63L/50	LC1 D50	10mm ² cable	
PR5200 022G3	22	44	CM1-63L/63	LC1 D65	16mm ² cable	
PR5200 030G3	30	60	CM1-63L/80	LC1 D80	25mm ² cable	
PR5200 037G3	37	74	CM1-63L/100	LC1 D115	35mm ² cable	
PR5200 045G3	45	90	CM1-63L/125	LC1 D150	35mm ² cable	
PR5200 055G3	55	110	CM1-63L/160	LC1 F180	35mm ² cable	
PR5200 075G3	75	150	CM1-225L/180	LC1 F265	25*4mm ² copper bar	The rated power and rated current refers to the soft starter maximum ratings. supporting the open circuit and bypass contact device specification should match the motor specifications
PR5200 090G3	90	180	CM1-225L/225	LC1 F265	25*4mm ² copper bar	
PR5200 115G3	115	230	CM1-225L/315	LC1 F320	25*4mm ² copper bar	
PR5200 132G3	132	260	CM1-400L/315	LC1 F400	40*4mm ² copper bar	
PR5200 160G3	160	320	CM1-400L/350	LC1 F500	40*4mm ² copper bar	
PR5200 185G3	185	370	CM1-400L/400	LC1 F500	40*4mm ² copper bar	
PR5200 200G3	200	400	CM1-400L/500	LC1 F630	40*4mm ² copper bar	
PR5200 250G3	250	500	CM1-630L/630	LC1 F800	40*5mm ² copper bar	
PR5200 280G3	280	560	CM1-630L/630	LC1 F800	40*5mm ² copper bar	
PR5200 320G3	320	640	CM1-630L/700	LC1 F800	40*5mm ² copper bar	
PR5200 400G3	400	800	CW1-1000/3	LC1 F1200	40*5mm ² copper bar	

Instruction of Soft Starter Terminal Wiring:

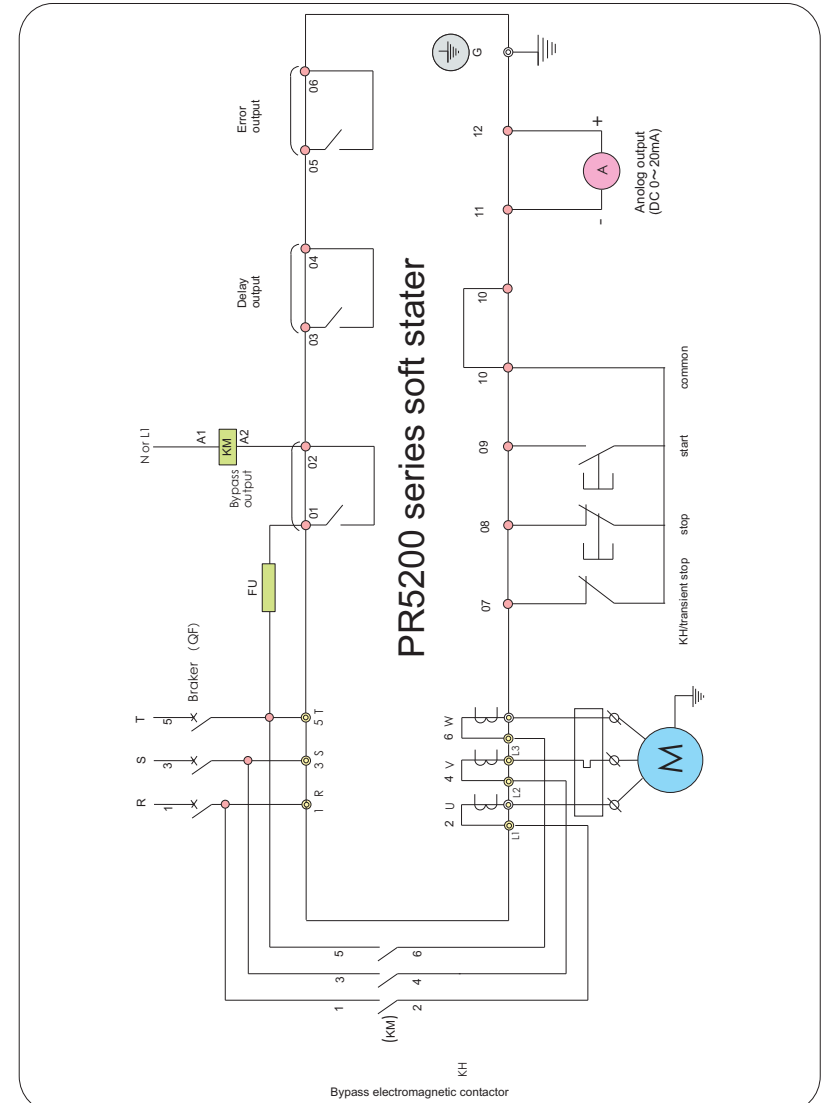
Output terminal like chart 1 illustration:



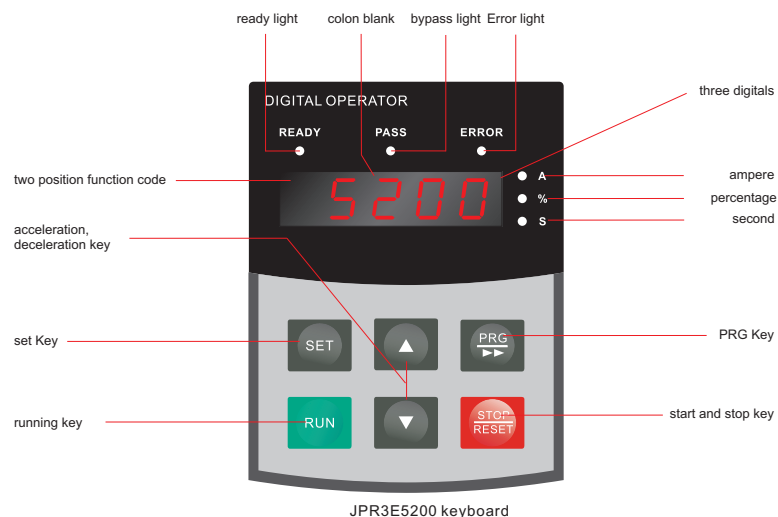
Terminal	Function	Instruction
1, 2	Bypass output	Which is used to control bypass contactor. Normally open terminal will close. The terminal capacity is AC250V/5A.
3, 4	Programmable relay output	Output model and function set by "PJ" parameter. This terminal is normally open passive pot. Capacity is AC 250V/5A.
5, 6	Error output	Which will close when soft starter error or power lose, Capacity is AC250V/5A.
7	Transient stop input	This terminal must connect with Terminal 10 when soft starter normally work. If terminal 7 disconnect with terminal 10, soft starter will transient stop and show error. This terminal can be controlled by normal close output terminal of outside protection device. Set PC to 0 (primary protection), this terminal function is prohibited.
8, 9, 10	Wiring of outside control start, stop button	There are two type wiring way (3lines and 2 lines) To choose proper way according to demand. As chart 2.
11, 12	0~20mA DC analog output	Which is used to inspect the motor current. The max 20mA indicates motor current is 4 times of soft starter rated current. Which can be viewed by extra 0~20mA current meter. The max resistor of output load is 300Ω.

★ Notes: The outside terminal should be correct connection, otherwise which will damage this soft starter.

PR5200 series soft starter main circuit diagram:



Keyboard Instruction:



JPR3E5200 keyboard

Name	Instruction
Startup state	When the indication ready light display 5200 or READY, then soft starter can start. The displaying 5200 means POWTRAN 5200 series soft starter. And ready means ready to start.
Delay state	Ready or error state indication light flash means interval, display dE×××" and countdown means startup delay.
Start and stop key	In the process of soft startup, the screen display ×××× to indicate motor current, and only Stop key is valid, and cannot enter menu to set parameter, and ready, running, error lights black out. In the process of soft stop, the screen display ×××× to indicates motor current, and only RUN key is valid, and cannot enter menu to set parameter, and ready, running, error lights black out. Meanwhile the stop key has reset function.
PRG Key	In the non-help mode, press the PRG Key to enter the setup menu, display PX: XXX, then press PRG key again, colon flashes, that means can modify the parameters after colon. Press the Set key when the colon flashes, if the data has been modified, it will display good and twice ring, indicating that new data has been saved, and then exit. If you do not want to save the new data, press the PRG key, colon will stop flashing and restoring the original data, then press Set key or Stop key to exit.
Set Key	In the non-setting state, press the Set key to enter the Help menu, display HX: XXX, press the Set key or Stop key to exit. In setting state, press the Set key to save the new setting of data and to exit the setting state.
Acceleration, deceleration key	In the setting menu, when the colon does not flash, press the acceleration or deceleration key to change the function number; when colon flashes, press the acceleration or deceleration key to change the data, press on the acceleration or deceleration key for more than 1 second, the data will be increased or decreased continuously and quickly. In the help menu, press the acceleration or deceleration key to change the function number and the corresponding message. When the indicator light of bypass operation is on, and did not enter the setting and help menu, display AXXXX, that means the motor running current, then press the acceleration or deceleration key to select display PXXXX or HXXXX. PXXXX indicates motor apparent power; HXXXX indicates motor overloaded heat balance coefficient. When indication value of HXXXX is more than 100%, soft starter will be overload protection and display Err08.
★ Notes:	<ol style="list-style-type: none"> 1. When the data is more than 999, the last decimal point is bright, indicates the mantissa + 0. 2. If the key operating is effective, there will be a voice tip, or this key does not work in this state. 3. When the external control terminal connected to a 3-wire mode, the external control start button and stop button have the equivalent function with start and stop keys on the control panel. 4. The control panel with super anti-jamming design, and the outside connection distance is allowable to be more than 3 m.

Keyboard Illustration:

Keyboard digital display illustration:

Display Letter	Relative Letter	Display Letter	Relative Letter	Display Letter	Relative Letter
0	0	1	1	2	2
3	3	4	4	5	5
6	6	7	7	8	8
9	9 or g	A	A or R	b	B
C	C	d	d or D	E	E
F	F	H	H	J	J
L	L	N	N	U	U or V
o	o	P	P	r	r
y	Y	AUN	RUN	UEr	Ver
rEADy	READY	Good	good	Err	Err

Help and Instructions:

Help information as following table:

Display	Explanation
AC : XXX	Three digital voltmeter, to monitor three-phase AC power supply voltage.
022-3	The specifications of soft starter is 22KW-380/50Hz
H1:E05	Last occurred fault information Err05.
H2:E01	There had been a fault information Err01.
H3:E06	There had been a fault information Err06.
H9:E00	There was no fault information.
Uer3.0	The software version of this product is Ver3.0. With the software upgrade, version with the increase.
LXXXX	Total number of successful starting.
RUNXX	The spending time (seconds) of last soft starting (starting successfully).

★ H1 ~ H9 with recursive way to store newly happened nine fault information.

Function Parameters:

Function parameters code in the following table:

Code	Name	Range of Set Value	Factory Setting	Explanation
P0	Starting voltage	30-70%	30%	Voltage slope model is effective, the starting voltage of current mode is 40%
P1	Soft starting time	2-60S	16S	Limiting current mode does not work.
P2	Soft stop time	0-60S	0S	Setting 0 means free stopping, please set 0 for one with two connections.
P3	Start delay	0-999S	0S	With a countdown delay, set to 0 without delay, starting immediately.
P4	Programming delay	0-999S	0S	For programmable relay output.
P5	Interval delay	0-999S	0S	Delay When overheated is released, indicator blinks to warn of the delay period.
P6	Starting to confine current	50-500%	280%	Limiting mode is effective, the maximum current limit value of Voltage slope model is 400%.
P7	Maximum operating current	50-200%	100%	Parameters input of P6, P7 is decided by P8.
P8	Enter the display method	0-3	1	See note 5.5 Other Settings Description.
P9	Under voltage protection	40-90%	80%	Protection when below the setted value.
PA	Over voltage protection	100-140%	120%	Protection when higher than the set value.
PB	Start mode	0-5	1	0 limit current, 1 voltage, 2 sudden stop + limit current, 3 sudden stop + voltage, 4 current ramp, 5 pairs of closed-loop.
PC	Output protection allowed	0-4	4	0 Primary, 1 light load, 2 standard, 3 overloaded, 4 senior.
PD	Operation control mode	0-7	0	Set 7 indicates banning starting or stopping operation, see note 5.5 other settings.
PE	Re-starting enable	0-13	0	See note 5.4 auto restart function.
PF	Parameters modified allowed	0-3	1	See note 5.5 Other settings.
PH	Manufacturers reserved			
PJ	Programming output	0-19	7	See note 5.3 programmable relay output.
PL	Soft stop the current limit	20-100%	80%	See note 7.3.1 soft stop mode.
PP	Motor rated current		Rating	Used to input motor nominal is rated current.
PU	Motor under load protection		0	See note 5.5 Other settings.

★ Note:

- 1.The maximum current of P7 is based on PP calculated sustainable operation of the maximum current according to the light and heavy of the load, More than this value will do inverse time thermal protection.
- 2.It will automatically exit the setting mode, if no key operation is more than 2 minutes during setting state.
- 3.Cannot set parameters in the soft start and soft stop process, but other states are no problem.
- 4.Pressing the Set key (PRG) when is powered on, can set the parameters (PJ excluded) to restore the factory values.

Protection Function:

PR5200 series soft starter with complete protection to protect the safety of soft starter and motor. During the application, appropriate protection parameters and level should be setted based on different situation.

Number	Protection Function	Parameter Instruction
1	Soft starter over-temperature protection	The temperature rose to 80 °C ± 5 °C over-temperature protection, when the temperature dropped to 55 °C (the lowest), no over-temperature protection.
2	Input phase protection lag time	<3 seconds
3	Three-phase unbalance protection lag time	<3 seconds
4	Three-phase unbalance protection lag time	<3 seconds. It is based on the deviation of all phase current greater than 50% ± 10%. When the load current is lower than 30% of the nominal rating of soft starter, the benchmark deviation will increase.
5	Starting time of over current protection	Continuous 5 times greater than the maximum operating current of the protection time setted by P7 in Table below.
6	Time of running overload protection	It is based on the maximum operating current of P7 and doing the inverse thermal protection, trip protection time curve shows on Chart below.
7	The protection lag time of much too low supply voltage	When the power supply voltage is lower than the 40% of limit, the protection time <0.5 seconds, or the protection time <3 seconds if it is lower than the setting value.
8	The protection lag time of much too high supply voltage	When the power supply voltage is lower than the 140% of limit, the protection time <0.5 seconds, or the protection time <3 seconds if it is higher than the setting value.
9	The protection delay time of load short-circuit	<0.1 seconds, the current is 10 times more than soft starter nominal rated current. This protection cannot replace fuse short-circuit protection device.
10	Motor under load protection	The current range is 10% to 90% of motor rated current, the protection action delay from 5 to 90 seconds.

These time parameters are from tested effective signal to a tripping protection instructions, and the parameters just for reference. All the protection functions of PR5200 series soft starter can be verified through the actual or simulation method. If it can't meet the user's requirements, special protection device should be added to ensure safety.

Protection Level:

Protection level and thermal protection time according to PC setting is as the diagram below:

PC setting	0(Preliminary)		1(Flow Load)			2(Normal)			3(Heavy Load)			4(Advanced)			Description
Running overload Level of protection	No	2Level	10Level			20Level			10Level			According to IEC60947-4-2 Standard			
Start over-current Protection time	No	3seconds	15seconds			30seconds			15seconds			Starting current for more than F7 setting 5times calculation			
Overload trip time running list	Current multiple (I/Ie)	3	4	5	3	4	5	3	4	5	3	4	5	Typical values for the table	
	Trip time(seconds)	4.5	2.3	1.5	23	12	7.5	46	23	15	23	12	7.5		

Setting Description:

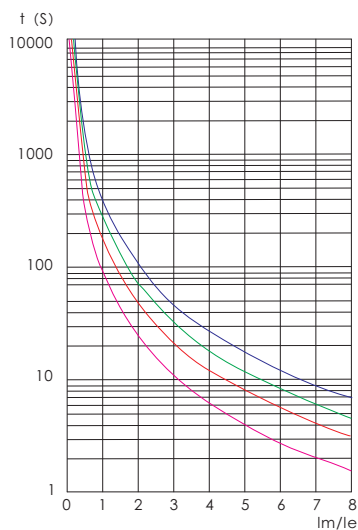
Protection level setting description

In order to adapt to different application fields, PR5200 series Soft Starters set five protection levels. There are level 0: preliminary level, level 1: flow load, level 2: general level, level 3: heavy load, level 4: higher level. Setting by setting item PC, among them:

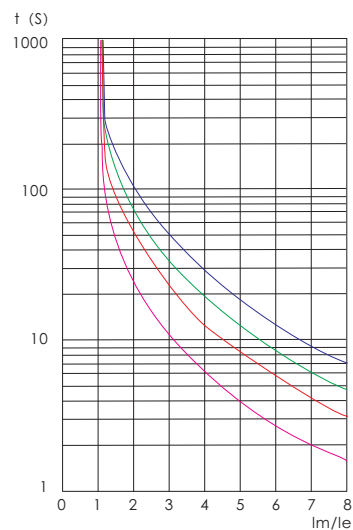
- 1) Preliminary protection prohibits output sudden stop Terminal, meanwhile, only retains overheating and short circuit and main circuit failure protection. Adapt to the need of unconditional urgent start occasions, such as fire-fighting systems.
- 2) Flow load, general load and heavy load protection levels consist of perfect protective functions, the differences between them lie in the different overload heat protection time curves of motors. The motor heat protection time parameters are referred to chart and diagram.
- 3) The higher protection standards are more rigid when start, others protection parameters are the same as standard protection setting.

According to IEC60947 -2 standard motor thermal protection tripping time curve as follows

1 Starter overload protection curve



2 Motor overload protection curve



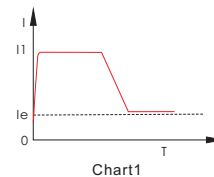
Start Mode:

To suit various complicated motors and load situations, PR5200 series Soft Starters set 6 different start modes. Users can choose different applications according to specific situation.

1 Current Limit Starting Mode

When setting item PB is 0, set start mode for this mode. Chart 1 shows the current limit mode of the motor starting current waveform changes.

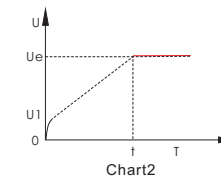
When the motor is lightly loaded or setting the current limit highly, the maximum starting current may not reach the set limit value is normal.



2 Voltage Ramp Start Mode

When setting item PB is 1, start mode is for this mode. Chart 2 shows the output voltage waveform as voltage ramp start voltage waveform.

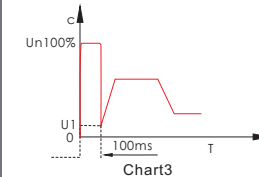
Starting time t is based on standard load obtained in the standard experimental conditions, control parameters, PR5200 series soft starter is based on this parameter benchmark, by controlling the output voltage, make the motor speed up in a smooth start-up process, not a mechanical control, regardless of time t . Acceleration is smooth. In view of this, when the load is light, set the start time often less than the starting time, as long as a smooth start is normal.



3 Current limit increases sudden jump

When setting item PB is 2, starter mode is for this mode.

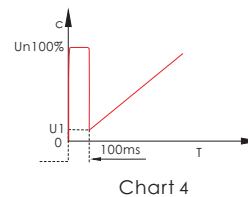
Chart 3 outlines the output changing waveform of sudden jump start mode (Vertical coordinate stands for Time, horizontal coordinate stands for voltage percentage).



4 Jumps the applied voltage

When setting item PB is 3, starter mode is for this mode.

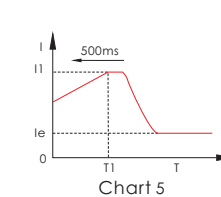
Chart 4 outlines the output waveform of jumps the applied voltage (Vertical coordinate stands for Time, horizontal coordinate stands for voltage percentage).



5 Jumps the applied voltage

When setting item PB is 4, start mode is for this mode.

Chart 5 shows the Current Ramp start mode output current waveform, which $I1$ is the current limit set P6, $T1$ value is the time set by P1.



6 The voltage limiting double loop start mode

When setting item PB is 5, starting mode is for this mode.

Double loop starting voltage limiting mode adopt voltage ramp and current limit dual closed-loop control model, is both stable requires and strict current limiting demanding, the integrated starter-limiting mode, it uses the prediction algorithm to estimate the work status of the motor.

In this start mode, output voltage waveform will be based on the motor and load conditions vary.

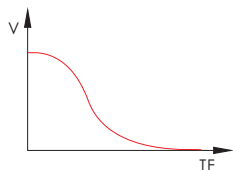
Stop Mode:

PR5200 series Soft Starters have two kind of power off patterns , those are soft power off mode and free power off mode

1 Soft stop mode

When setting item PB is not 0 , set the stop mode for this mode.

In this stop mode, the motor power start from the bypass contactor and switch to the output of soft starter thyristor, soft starter output voltage decrease steadily from the total pressure, reducing the motor speed steady in order to avoid mechanical shock, till the motor stops running. Soft stop output cut-off voltage equal to the initial equals to initial starting voltage.



2 Free stop mode

In this stop mode, when the soft starter receive the stop command, immediately disconnect the bypass contactor and ban soft starter thyristors voltage output, motor gradually stop as load inertia. In the situation of one drive two(more) wiring, should set soft starter stop mode as this, in order to avoid of the phase fault reporting when output switching.

As stop model completely ban the instantaneous output, can avoid an instantaneous high-current impact in special applications.

Special Application:

Item	Explanation
Motors in parallel Start	If not exceed the rated power limit of the soft starter, the motor can be connected in parallel (motors sum current can not exceed the power of soft starter, the type selected depending on the application rated current), but at this time should provide additional thermal protection devices for each motor.
Two-speed motor start	PR5200 series soft starter can start with two-speed motor, before changing from low speed to high speed, must be solved by delayed magnetic period, to avoid a very large reverse current between the line and the motor.
Long cable	As the resistance of the cable causes, a very long motor cables could cause voltage landing, if the voltage drop is very obvious, it will affect the current consumption and starting torque, when choosing motor and soft starter, must consider this.
Soft starters paralleled with the same one power line	If in a power line, installed several soft starters, should install the input reactor between the wiring of the soft starter and transformer, to the middle of the line should be . Reactor should be installed between each feeder circuit breaker and soft starter.
Surge Protection Device (SPD) application	In the applications which may suffer from lightning or other causes that lead to overvoltage, over current, surge interference, should consider installing a surge protector, detailed application methods instructions, refer to POWTRAN company "surge protector (SPD)" Product Sample or other relevant data.

Application Illustration:

Under different load conditions, parameter settings for example shown in Table . Data in the table is only for reference, should be adjusted according to actual situation

Type of load	Start time (seconds)	The initial voltage	Voltage starting (maximum current limit)	Limit start
Ball	30	60%	4	4.5
Fans	26	30%	4	3.5
Centrifugal pump	16	40%	4	2.5
Piston compressor	16	40%	4	3
Enhance the mechanical	16	60%	4	3.5
Mixer	16	50%	4	3
Crusher	16	50%	4	3.5
Screw compressor	16	40%	4	3
Screw conveyor	20	40%	4	2
Light load motor	16	30%	4	3
Belt conveyors	20	40%	4	2.5
Heat pump	16	40%	4	3



Model selection reference:

Mechanical application type	Load type	Starting current(A)	Starting time(t)	
Centrifugal pump	Standard load	300	5-15	
Piston pump				
Fan		350	5-15	
5-15 cold-reducing machine		300	10-40	
Screw compressor		300	5-10	
Centrifugal compressor	Standard or heavy load	350	3-20	
Piston compressor	Standard load	300	10-40	
Conveyor belts conveyor		50	5-10	
Spiral Crane		350	3-10	
T-type cable car		300	3-10	
Elevator		300	2-10	
Circular Sew		100	15-10	
Band Sew		Or heavy load	350	10-16
Blending machine Cutting machine chip		Heavy load	400	3-10
Mixer		350	5-20	
Mixer		350	5-10	
Grinding machine	Heavy load	450	5-60	
Breaker	Standard load	400	10-40	
Refiner		300	5-30	
Press	Heavy load	400	20-60	

Fault causes and treatment

Fault codes and treatment as below :

Display	Explanation	Problems and treatment methods
Err00	Failure has been solved	Just happened under voltage, overvoltage or overheating, instantaneous stop terminals are open, such failures, now has been normal, this time to prepare lights, reset to start the motor.
Err01	External terminal momentary open circuit	Short-circuit connection with the external instantaneous stop terminal⑦and public terminal⑩, or connecting to other protective devices normally closed contact.
Err02	Soft starter overheating	Start too often or motor power is unmatched with the soft starter.
Err03	Starting time more than 60s	Start parameters set inadequate, too heavy load or the power capacity is not enough etc.
Err04	Input phase lost	Check input or main circuit failure, whether bypass contactor is stuck in on position or whether SCR is in open circuit etc.
Err05	Output phase lost	Check output or main circuit failure, whether bypass contactor is stuck in on position or whether SCR is in open circuit etc.
Err06	3-phase unbalanced	Check whether input 3-phase power or load motor is normal.
Err07	Over currency start	Whether load is too heavy or motor power is unmatched with soft starter.
Err08	Running overload protection	Whether load is too heavy or setting item P7、PP parameters incorrectly.
Err09	Power supply voltage is too low	Check input power source voltage or setting item P9 parameters incorrectly.
Err10	Power supply is too high	Check input power source voltage or setting item PA parameters incorrectly.
Err11	Setting parameters error	Modify the settings or press the enter button to reset to factory values.
Err12	Load short-circuit	Check whether load or SCR short circuit or too high load.
Err13	Automatic restart wiring error	Check whether external control start or stop terminal not connect to 2-wire mode.
Err14	External stop terminal wiring error	When external control is allowed, external control stop terminal is open circuit, in this way motor can't start.
Err15	Motor under load	Check motor principal shafts and load faults.

★ Note : Some fault phenomena are interrelated, as the report Err02, may be related with soft starter overheating or load short current, so when checking fails, consideration should be comprehensive, accurately determine the point of failure.

Specification:

In accordance with standard		Unit	PR5200 developed the electronic soft start t-soft start unit ,and passed performance testing ,meet the requirements of national standard.
3-phase power source	V		208-10% 240+10% 380-15% 415+10% 440-15% 500+10%
voltage frequency	Hz		50
Nominal current motor power	A		11...800total 21 ratings.
	KW		5.5...400
Motor voltage	V		208...240 380..415 440...500
Adjust the current			Motor's nominal current In can modify below through PP parameters, that is to say , motor nominal rated current must less than or equals to soft starter's rated current. Start limit current can adjust from 0.5 to 5 times between In through parameter P6.
Start mode			Current limit start Current ramp Voltage ramp start Double -closed loop start mod Current limit increases sudden jump
Stop mode	Free stop		
	Soft stop		Between 0.5 to 60s can adjust through writing programmable codes.
Displayer and keyboard			In normal operation will display motor operating current or the percentage rate. It will display relevant content when malfunctioning. Keyboard can set parameters and contact function and lock up.
Protection	Main power supply protect		A fully protect to motor and soft starter devices : phase break protection and phase imbalance protection , confirmed by output relay.
Select starter			Choose PR5200 devices according to motor nominal power and load capacity : starter power can be used on general load or heavy load.



PRODUCT SERIES



POWTRAN®



PI9000 Series
High-performance
Non-sense Vector
Converter

POWTRAN®



PI8100 Series
Sensorless vector
control inverter

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PI7800 Series
General frequency
inverter

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PR5200 Series
Motor soft-starter

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ADSD-S-A Series
AI synchronism
servo driver

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PI7900 Series
Electromagnetic
stirring power
source

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PB60 Series
Braking unit &
braking resistor

POWTRAN®



PI130 系列
Economical vector
control inverter

POWTRAN®



PI7600 Series
General frequency
inverter

POWTRAN®



PI7800 Series
Mid-voltage
frequency inverter

POWTRAN®



PR5200C Series
Soft start motor
integrated cabinet

POWTRAN®



ADSD-S-S Series
AI synchronism
servo driver

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PS7800 Series
Motor environmental
energy saver

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Water supply
controller