# XPD AC motor smart soft starter

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# XPD soft start expert

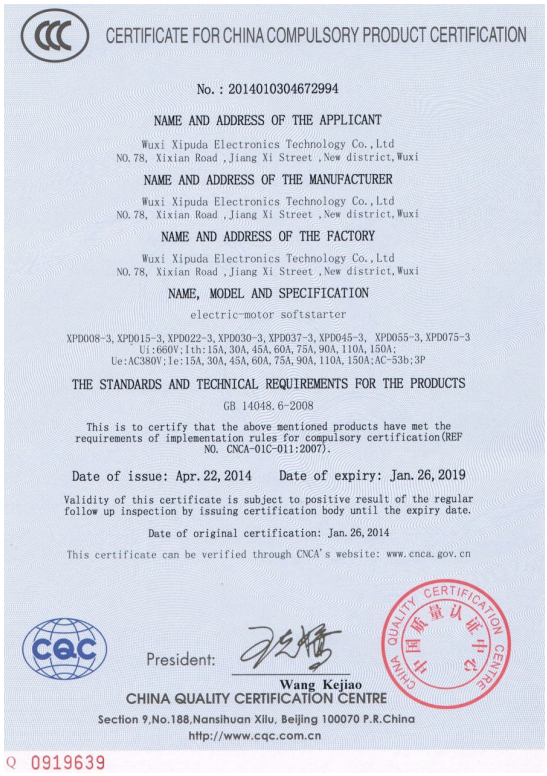
Brand name products made in China

# XPD AC motor smart soft starter
# B-type instructions V2.1

WUXI XIPUDA ELECTRONICS TECHNOLOGY CO,.LTD

# XPD soft start expert

## CERTIFICATE



CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION

No. : 2014010304672994

NAME AND ADDRESS OF THE APPLICANT

Wuxi Xipuda Electronics Technology Co.,Ltd
NO.78, Xixian Road ,Jiang Xi Street ,New district,Wuxi

NAME AND ADDRESS OF THE MANUFACTURER

Wuxi Xipuda Electronics Technology Co.,Ltd
NO.78, Xixian Road ,Jiang Xi Street ,New district,Wuxi

NAME AND ADDRESS OF THE FACTORY

Wuxi Xipuda Electronics Technology Co.,Ltd
NO.78, Xixian Road ,Jiang Xi Street ,New district,Wuxi

NAME, MODEL AND SPECIFICATION

electric-motor softstarter

XPD008-3, XPD015-3, XPD022-3, XPD030-3, XPD037-3, XPD045-3, XPD055-3, XPD075-3
Ui:660V; Ith:15A, 30A, 45A, 60A, 75A, 90A, 110A, 150A;
Ue:AC380V; Ie:15A, 30A, 45A, 60A, 75A, 90A, 110A, 150A; AC-53b; 3P

THE STANDARDS AND TECHNICAL REQUIREMENTS FOR THE PRODUCTS

GB 14048.6-2008

This is to certify that the above mentioned products have met the requirements of implementation rules for compulsory certification (REF NO. CNCA-01C-011:2007).

Date of issue: Apr. 22, 2014 Date of expiry: Jan. 26, 2019

Validity of this certificate is subject to positive result of the regular follow up inspection by issuing certification body until the expiry date.

Date of original certification: Jan. 26, 2014

This certificate can be verified through CNCA's website: www.cnca.gov.cn

President: Wang Kejiao

CHINA QUALITY CERTIFICATION CENTRE

Section 9,No.188,Nansihuan Xilu, Beijing 100070 P.R.China

http://www.cqc.com.cn

Q 0919639

CHINA QUALITY CERTIFICATION CENTRE

CERTIFICATE OF CONFORMITY

Certificate No.: CE140307004333

| | |
|---|---|
| *Product* | electric-motor softstarter |
| *Applicant* | Wuxi Xipuda Electronics Technology Co.,Ltd<br>NO.78, Xixian Road ,Jiang Xi Street ,New district,Wuxi |
| *Type/model* | XPD008-3,XPD015-3,XPD022-3,XPD030-3,XPD037-3,XPD045-3, XPD055-3,XPD075-3 |
| *Technical data* | Ui:660V;Ith:15A,30A,45A,60A,75A,90A,110A,150A;<br>Ue:AC380V;Ie:15A,30A,45A,60A,75A,90A,110A,150A;AC-53b;3P |

This is to certify that, on the basis of the tests undertaken as per Report No. 03601-A-13Y0060-S, the submitted sample of the above item complies with:

**EN 60947-4-2:2000+A1:2002+A2:2006**

and fulfill testing requirement of the European Directive:

**2006/95/EC**

Date of issue: Oct.11,2014

Date of expiration: Oct.11,2017

President:

CHINA QUALITY CERTIFICATION CENTRE

Section 9,No.188,Nansihuan Xilu, Beijing 100070 P.R.China

http://www.cqc.com.cn

CE 0003053

恒标 HBQA

QUALITY MANAGEMENT SYSTEM CERTIFICATE OF CONFORMITY

Registration No.: 06714Q10409R0M

This is to certify that the Quality Management System of:

**Wuxi Xipu Da Electronic Technology Co., Ltd.**

No.78 Qian Xi Xian Road, Jiang River Street Square, New Area, Wu Xi City, Jiangsu Province Postcode: 214111

has been found to conform to Quality Management System Standard:

**GB/T 19001-2008/ISO 9001:2008**

This certificate is valid only to quality Management system certification

related to the following product(s)/service(s):

**Production and Service of Soft Starter Motor, Inverter Sales**

(Deletion of Clause: 7.3)

Date of Issue: May.7.2014

Valid Date: May.7.2014 — May.6.2017

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(Certified organizations within the validity period of the certificate surveillance audit at least once a year, and supervision of qualified audit logo paste on the corresponding position,the certificate is valid. The certificate valid state please login: www.hbqc.com.cn queries.)

BEIJING HENGBIAO QUALITY CERTIFICATION CO.,LTD.

NO. 28, Zhongguancun South Ave, Haidian District, Beijing, P. R. China

General Manager:

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IEC IECEE CB SCHEME

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IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

| | |
|---|---|
| Product / Produit | electric-motor softstarter |
| Name and address of the applicant / Nom et adresse du demandeur | Wuxi Xipuda Electronics Technology Co.,Ltd<br>NO.78, Xixian Road ,Jiang Xi Street ,New district,Wuxi |
| Name and address of the manufacturer / Nom et adresse du fabricant | Wuxi Xipuda Electronics Technology Co.,Ltd<br>NO.78, Xixian Road ,Jiang Xi Street ,New district,Wuxi |
| Name and address of the factory / Nome et adresse de l'usine | Wuxi Xipuda Electronics Technology Co.,Ltd<br>NO.78, Xixian Road ,Jiang Xi Street ,New district,Wuxi |
| Ratings and principal characteristics / Valeurs nominales et caractéristiques principales | Ui:660V;Ith:15A,30A,45A,60A,75A,90A,110A,150A; Ue:AC380V;Ie:15A,30A,45A,60A,75A,90A,110A,150A;AC-53b;3P |
| Trademark (if any) / Marque de fabrique (si elle existe) | |
| Model / Type Ref. / Ref. De type | XPD008-3,XPD015-3,XPD022-3,XPD030-3,XPD037-3,XPD045-3, XPD055-3,XPD075-3 |
| Additional information (if necessary may also be reported on page 2) / Les informations complémentaires (si nécessaire, peuvent être indiqués sur la 2ème page) | |
| A sample of the product was tested and found to be in conformity with / Un échantillon de ce produit a été essayé et a été considéré conforme à la | PUBLICATION EDITION<br>IEC 60947-4-2:1999+A1:2001+A2:2006 |
| As shown in the Test Report Ref. No. which forms part of this Certificate / Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat | 03601-A-13CB0079-S |

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme National de Certification

CHINA QUALITY CERTIFICATION CENTRE

Date: 2014-04-25 Signature: Wang Kejiao

Issued 2003-05
China Quality Certification Centre
Section 9,No.188,Nansihuan Xilu, Beijing 100070 P.R.China
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Fax: +86-10-83886282
website www.cqc.com.cn

CB 0025338

# Introduction

Thank you for using the XPD series B-type full digital AC motor smart soft starter produced by WUXI XIPUDA ELECTRONICS TECHNOLOGY CO,.LTD
In order to use the XPD series B-type smart soft starter correctly and guarantee security of the operator, please read this instruction manual carefully before using the smart soft starter. Please contact WUXI XIPUDA ELECTRONICS TECHNOLOGY CO,.LTD or local dealer if you find that there is no answer for problems occurred in operation, we will do our best to service you.

Safety notice
1. The smart soft starter shall be installed by specialized technical personnel or under the instructions of the specialized technical personnel;
2. The power and specifications of the load motor shall match with the smart soft starter as far as possible.
3. Never connect capacitors with the output terminals of the smart soft starter (U,V,W);
4. The connection of the input wire and output wire of the smart soft starter shall be wrapt by insulating tape.
5. The housing of the smart soft starter must be earthed reliably;
6. The input power supply must be switched off before maintaining the equipment;

7. The interior circuit board shall not be maintained by non-professional for there is high voltage of the interior circuit board.

# Content

# 1. Functions and characteristics of XPD series B-type smart soft starter

XPD series B-type digital AC motor smart soft starter is a kind of new starting equipment ranged at international advanced level and produced by adopting electric power and electronic technology, microprocessor technology and lead control theory design. This product can limit starting current of the asynchronous motor in the starting effectively and can be used extensively in the loads of the blower fan, the water pump, the transportation device, and it is the idea product for generation changing of the reduced voltage starting equipment in traditional star/triangle conversion, auto-coupling voltage reduction, and magnetic control reduction voltage.

## 1.1 Function

Reduce starting current of the motor and decrease capacity of power distribution to avoid investment in the capacity increase.

Reduce starting stress and prolong service life of the motor and relevant equipments.

With Multi-starting mode, wide range current and voltage, the smart soft starter can adapt multi-loading condition and can improve technology.

## 1.2 Characteristics

**Starting mode** Different starting mode and parameter setting can be selected according to characteristics of the load. The softer starter can optimize the starting effect of the motor to the most extent.

**High technology performance**

The control circuit is simplified by adopting high performance microprocessor and powerful software support function. Consistent, accurate and quick speed of execution can be obtained without adjusting the circuit parameters.

**High reliability** All electric elements of the XPD series B-type smart soft starter are filtrated strictly, and the master control board has been circle tested for 72 hours at high temperature and vibration tested, and thereby the high reliability of the product can be guaranteed.

**Structure optimized** Unique compact modular structure and connecting mode of upper inlet wire and lower outlet wires make the starter more compact and it facilitate the integration and mating of starter.

**Set up function of keyboard**

Convenient and visualized operation display keyboard can be used to set up and modify the start, stop, operation and protection parameters according to different loads.

**Protective Function** The XPD series B-type smart soft starter can provide the motor with protective functions of open-phase, overload, overcurrent and excess starting time.

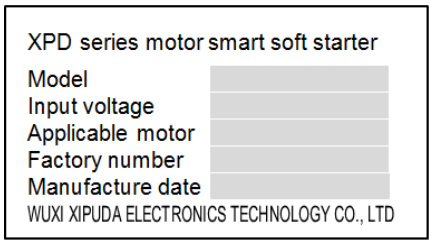
**Rated power supply outputted**

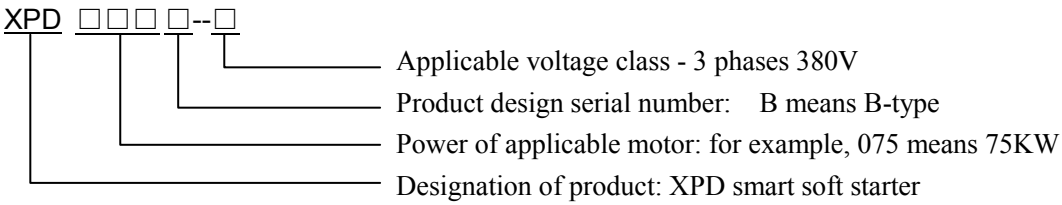
Actual output current of the smart soft starter can be adjusted within a certain range to make the actual output current of the smart soft starter match with the actual load current if the nominal power of the smart soft starter is larger than the actual load power, and thereby to guarantee the output power of the smart soft starter match with the actual load power.

# 2. Model of product and inspection

All functions and operation performance of each XPD series B-type smart soft starter have been tested before leaving the factory. The user shall inspect the smart soft starter as per following procedures when received the smart soft starter, and please contact the supplier immediately when found there are any problems of the XPD smart soft starter.

Inspect nameplate of the product: make sure that the cargo you received is the product you had purchased.




Inspect the product to see if it is suffered by those damages during transportation process: disconnection of internal parts, pit or distortion of the housing, disconnection of wire, etc.

Quality certificate and operating instructions: There are quality certificate and operating instructions inside each smart soft starter.

# 3. Working conditions and installation

## 3.1 Working conditions

Working conditions has important effect on normal operating life of the smart soft starter, so the smart soft starter shall be installed on the locations where meet requirements of following working conditions.

**Working conditions of conventional product:**

Power supply: commercial power, private station, diesel electric set

Three phases current: 380V(-20%, +15%), 50Hz

Applicable motor: general squirrel-cage asynchronous motor (winding motor may be applicable by negotiation);

Starting frequency: Recommended starting frequency of standard products shall be less than 15times/h (according to the load);

Type of cooling: natural air cooling for the starters of which the power is up to 75Kw, and forced-air cooling for the starters of which the power is more than 90Kw;

Working conditions: The XPD series B-type smart soft starter must be equipped with bypass contactor and necessary motor protective device in operation.

Protection level: IP20;

Ambient conditions: The capacity shall be reduced when using the starter at the elevation over 2000m;

Ambient temperature: -25 ℃ - 45 ℃

Relative temperature: not exceed 95% (20+/-5℃), without condensation, without flammable and combustive and corrosive gas, without conductive dust. Indoor installation, well-ventilated. Shaken shall be less than 0.5G..

## 3.2 Installation requirements

The installation style of the XPD series B-type smart soft starter is wall hanging type, in order to guarantee the ventilation and heat dissipation of the equipments, the equipments shall be installed as per following requirements:

**Installation orientation and space**

In order to guarantee well ventilation and heat dissipation conditions of the XPD series B-type smart soft starter in operation, the smart soft starter shall be installed uprightly and sufficient heat dissipation space shall be set aside under and above the equipment, see figure 3-1.

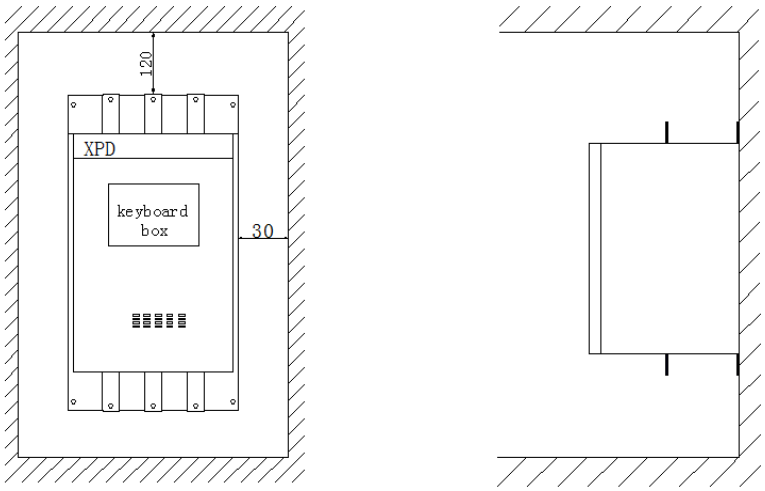



Figure3-1

**Installed in the cabinet**

Cabinet well ventilated shall be used when the XPD series B-type smart soft starter is installed in the power distributing cabinet. The starter can be installed in the cabinet in the arrangement of cross installation, see Figure 3-2.And installation of longitudinal arrangement can be adopted too, see Figure 3-3.However, a wind guiding spacer plate shall be added between the smart soft starters installed on the upper and lower to prevent the upper smart soft starter from being influenced by the heat from the lower smart soft starter, if installation of longitudinal arrangement is adopted (especially for the smart soft starter with forced-air cooling).

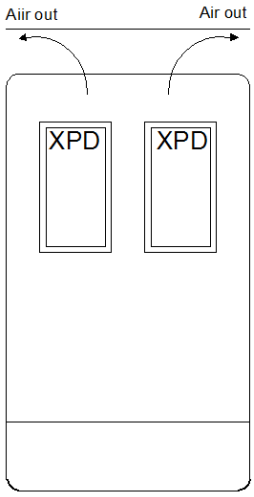



Figure 3-2 Installation of cross arrangement

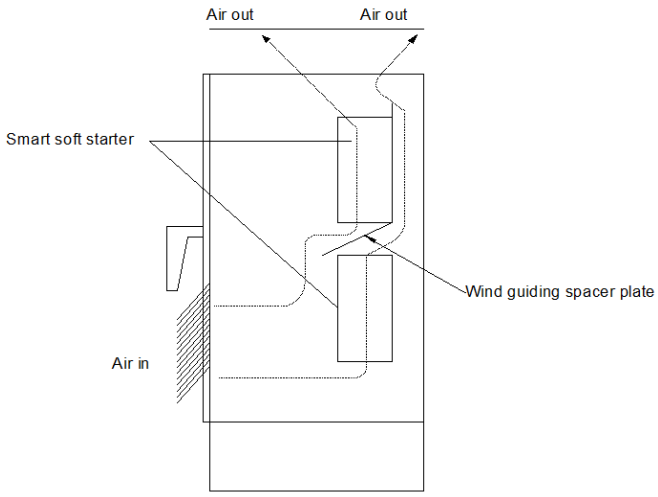



Figure 3-3 Installation of longitudinal arrangement

# 4. Operating principle

Three pairs of antiparalleled thyristors of the XPD series B-type smart soft starter are series connected in the circuit of the stator in the alternating current motor. As the thyristor has the function of electronic switch, a microprocessor is used to control the trigger angle of the thyristor to change the opening degree of it, and therefore the input voltage of the motor is changed and the soft starting of the motor is realized.

The output of the smart soft starter will reach the rated voltage after the starting is completed and the three-phase bypass contact KM will be controlled by output signal of bypass control to pull-in, and the motor will be connected with the electric network directed to operate, see Figure 4-1.

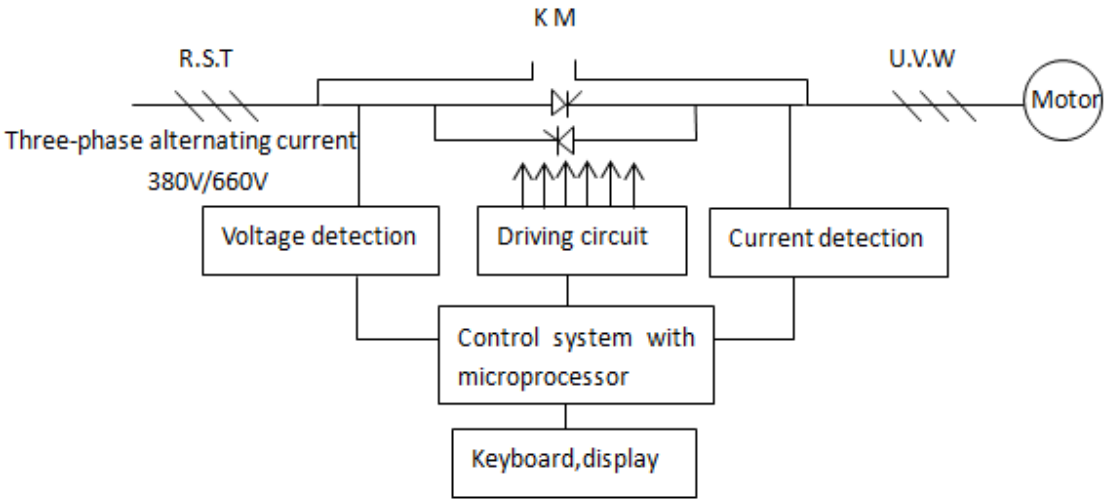



Figure 4-1

# 5. Basic wiring and external connected terminal

## 5.1 Wiring of main circuit

There are 6 wiring terminals in the main circuit of the XPD series B-type smart soft starter. And they are led out by the copper bars. The wiring method that use R.S.T as input terminals (connect with inlet power supply) is upper inlet wire mode and the wiring method that use U.V.W as output terminals (connect with the motor) is lower outlet wire mode. The bypass contactors are bridged between the R,S, T and U, V, W.

## 5.1.1. Matters need attention in wiring of main circuit

1. The XPD series B-type smart soft starter has no on-line operating function after the starting is completed, wherefore it must be equipped with the bypass contactor KM, see Figure 5-2.
2. The XPD series B-type smart soft starter only has open-phase protective function of input voltage after the starting is completed and the bypass contactor is putted into service, so a thermal relay or a motor protector shall be connected to the motor side to protect the motor in the operation, see Figure 5-2.

## 5.2 Wiring of control circuit

There are exterior control interfaces pre-- set aside on the XPD series B-type smart soft starter, and see Figure 5-1 for detailed arrangement of 10 exterior wiring terminals. It can be used by consumer to realize external signal control and remote control.

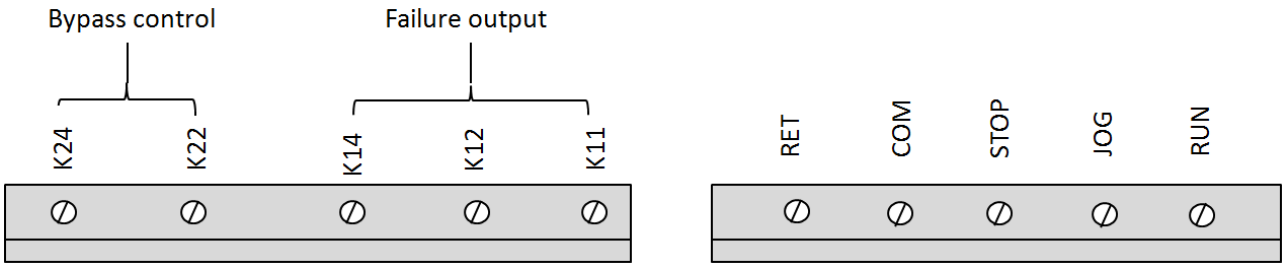



Figure 5-1

**Where:** 5 output terminals: K14, K12, K11, K22, K24 are all interior relay outputs of the smart soft starter (Non-source terminal).
5 input terminals: start terminal (RUN), stop terminal (STOP), jog terminal (JOG), reset terminal (RET) and common terminal (COM).

## 5.2.1 Matters need attention in wiring of control circuit

1. The consumer can connect relevant wires with the exterior control terminals to realize remote control or to use the failure output terminals as alarm signal in the operation of the XPD series B-type smart soft starter. It is needn't to connect the wires with the relevant exterior terminals if the consumer only use the keyboard of the equipment to control the motor and do not need to use the external signal.
2. There are two wiring methods of the XPD series B-type smart soft starter for external starting and stop control, these are three-wire control wiring and two-wire control wiring, see Figure 5-2 for details.

## 5.3 Basic wiring diagram and exterior control terminal comparison table of XPD series B-type starter

### 5.3.1 Basic wiring diagram

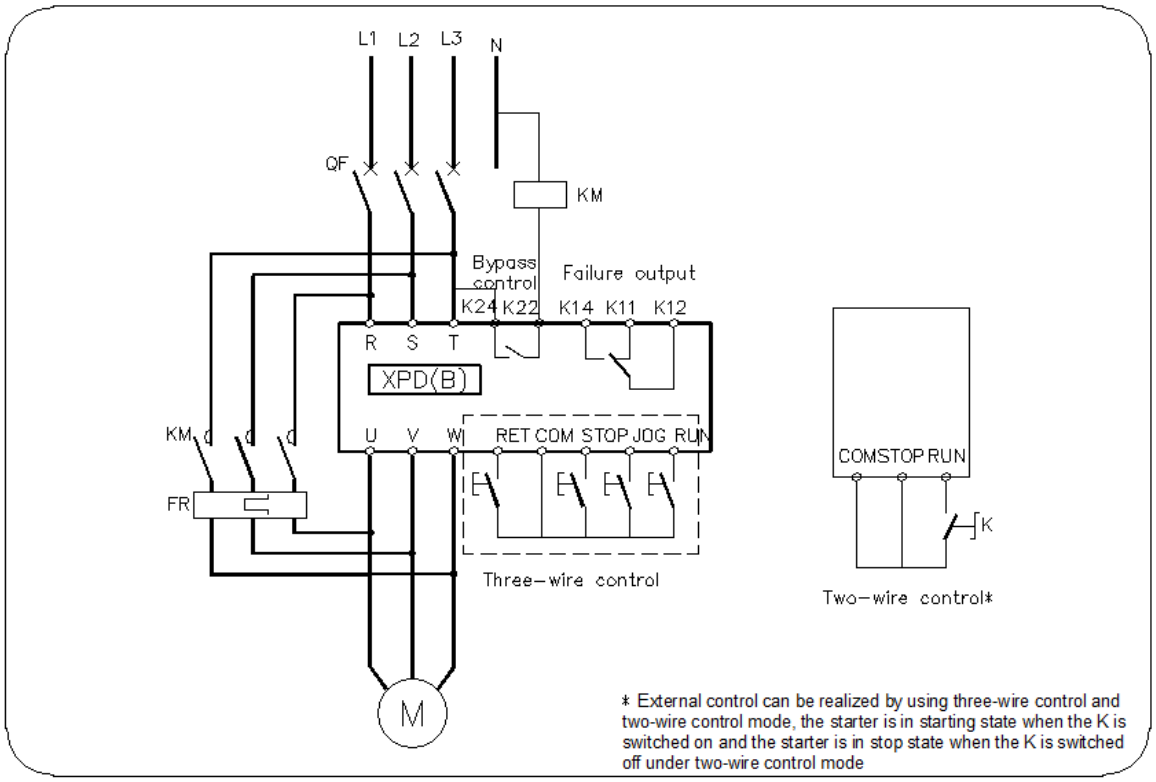



Figure 5-2

## 5.3.2 Comparison table of exterior control terminals

Table 5-1

| Terminal description | | Name of terminal | | Description |
|---|---|---|---|---|
| Main circuit | R.S.T | Input terminal of AC power supply | | Connect with three-phase alternating current via circuit breaker (QF) |
| | U.V.W | Output terminals of smart soft starter | | Connect with three-phase asynchronous motor |
| Control circuit | Digital input RUN | Motor control terminal of external starting | | External starting can be realized by short-circuit of the RUN and COM |
| | STOP | Operational control terminal for stopping motor from exterior | | External stop can be realized by disconnection of STOP and COM |
| | JOG | Motor control terminal of external jog | | Jog can be realized by short-circuit of JOG and COM |
| | RET | Exterior control reset terminal | | Failure reset can be realized by short-circuit of RESET and COM |
| | COM | Common terminal of external control signal | | Reference point of internal power supply |
| | Relay output K14 | Normally opened | Failure output terminal | K12-K14 closed when failure occurs<br>K11-K12 are disconnected<br>Contact capacity<br>AC: 5A/250V<br>DC:10A/30V |
| | K11 | Normally closed | | |
| | K12 | Common | | |
| | K24 | Normally opened | Externally connect with the control terminal of bypass contactor | K24-k22 are closed after starting is completed<br>Contact capacity<br>AC:5A/250V<br>DC:10A/30V |
| | K22 | Common | | |

★ means there are two wiring methods for exterior control, see basic wiring diagram 5-2 for details.

# 6. Control mode and operating mode of XPD series B-type smart soft starter

There are two starting modes of voltage-slope start and current limited start available as for the XPD series B-type starter. And there is also the jog operating function. The consumer can choose one of those three independent start modes according to different load and specific requirements.

## 6.1 Voltage-slope soft start control mode

Voltage variation oscillogram of voltage-slope start is shown in Figure 6-1, and U0 is the initial voltage value outputted by the smart soft starter in the starting process. The output voltage of the smart soft starter rise quickly and come to U0 when the motor is started, and then the output voltage of the smart soft starter will rise gradually in the time t set, and the motor is accelerated continuously along with the rising of the voltage. The starting process is completed when the voltage reaches rated voltage Ue and the rated speed of the motor is reached. Both initial voltage U0 and starting time t can be set according to loading conditions, and the setting range of the U0 is from 0% to 50% of the voltage of the electric network, and the setting range of the t is from 1s to 120s.

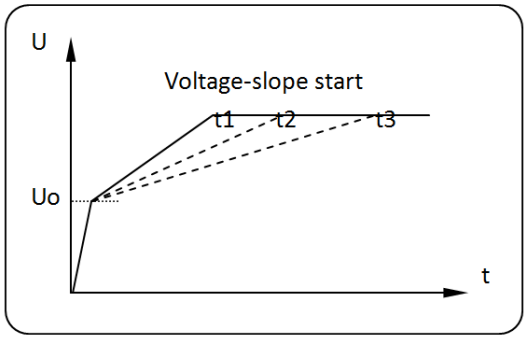



Figure 6-1

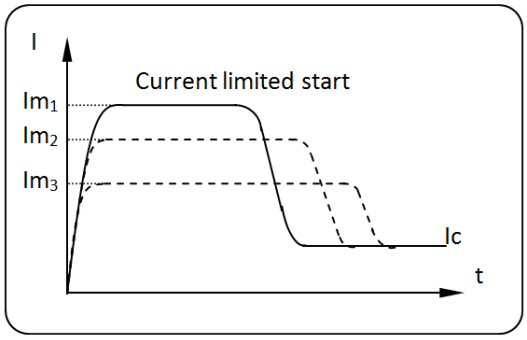



Figure 6-2

## 6.2 Current limited soft start control mode

Under the current limited starting mode, the output voltage value rise quickly in the start of the motor until the output current reaches the set amplitude limited current value Im, and the starter hold this output current value at a point that is not higher than the current value Im to make the motor to accelerate gradually, see Figure 6-2. The output current will descend to the rated current Ie quickly when the speed of the motor is approaching the rated speed, and then the starting process is completed. The amplitude limited current value can be set according to the actual load. And the setting range is from 100% to 500% (1 to 5 times) of the rated current Ie of the motor.

## 6.3 Jog operating control mode

The output voltage of the smart soft starter is increased quickly to the jog voltage u1 and is held at this point under this control mode. The output torque (Figure 6-3) of the motor in jog operation can be changed by changing the set value of the u1, and this function is very useful to the trial run or orientation of some loads.

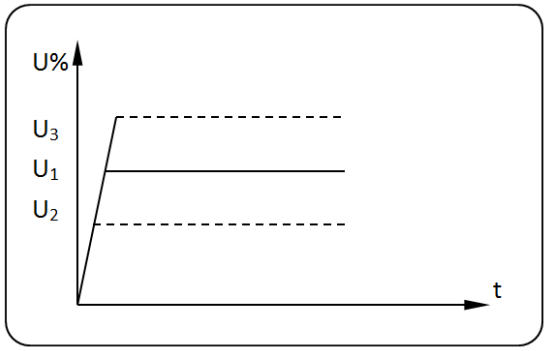



Figure 6-3

# 6.4 Five operating modes of XPD series B-type smart soft starter

**►Ready operating mode**

The smart soft starter will carry out self checking when power on. The self checking include: Checkout parameters set up by the consumer (error protection of parameter setting), voltage phase judgment (open-phase protection) and temperature of the system (Smart soft starter overheating protection), etc. The system will enter into failure standby state if there are any failure occurs. The Smart soft starter will enter into the ready operating mode if the self checking is normal, and the rdy mark is displayed on the keyboard panel. And the operating mode indicating light on the left side of the will indicate current starting control mode at the same time.

**► Parameter setting operating mode**

Press down and hold the PRG button for 5s or press PRG button and ▼ button to make the smart soft starter enter into the parameter setting operating mode when the smart soft starter is under the ready operating mode. Each control parameters can be modified under this mode. See clause 8.3 parameter setting for details.

**► Start operating mode**

Press start key RUN when the smart soft starter is under the ready operating mode and the start-stop operating control mode is permitted, the smart soft starter will start the motor as per pre-set operating mode immediately, and display the starting current value on the keyboard at the same time.

The starting or operation of the motor will be terminated when press down stop button STOP at any time in starting procedure, and the starter will come back to the ready operating mode rdy.

The system can continuously monitor those parameters such as the input voltage phase, the sudden heavy current (short circuit or motor locked rotor protection), the starting time (starting overload protection) and the temperature of the system (smart soft starter overheating protection) under this mode.

**►Bypass operating mode**

The normal opened terminals K22, K24 on the by-pass controller of the smart soft starter will be closed automatically after the smart soft starter start the motor successfully, and then those terminals are used to switch on the KM, the bypass contactor will connect the motor with the electric network and the motor will operate normally, and then the triggering signal of the controllable silicon module are closed. The Keyboard will display b-P, indicate that the start process and the bypass operation have been completed.

Press stop button STOP under this state and the bypass contactor will be disconnected to terminate the operation of the motor and the system will come back to the ready operating mode rdy.

**►Failure protection mode**

The smart soft starter will enter into the failure protection mode and block input and output quickly if system

finds that one of the parameters monitored exceeds specified value when the smart soft starter is under the starting mode, the operating mode or the ready operating mode, and the keyboard panel will display the failure code. See "Description of failure display and resolutions" for details of the failure codes.

# 7. Function and description of operating keyboard

There is an operating keyboard with digital display function for the XPD series B-type smart soft starter to realize the operation of the smart soft starter. These operations include: display the data, set up and store the parameters, query the data, failure protection display, failure reset, and start and stop the motor in time, etc. See Figure 7-1 for structure of the keyboard.

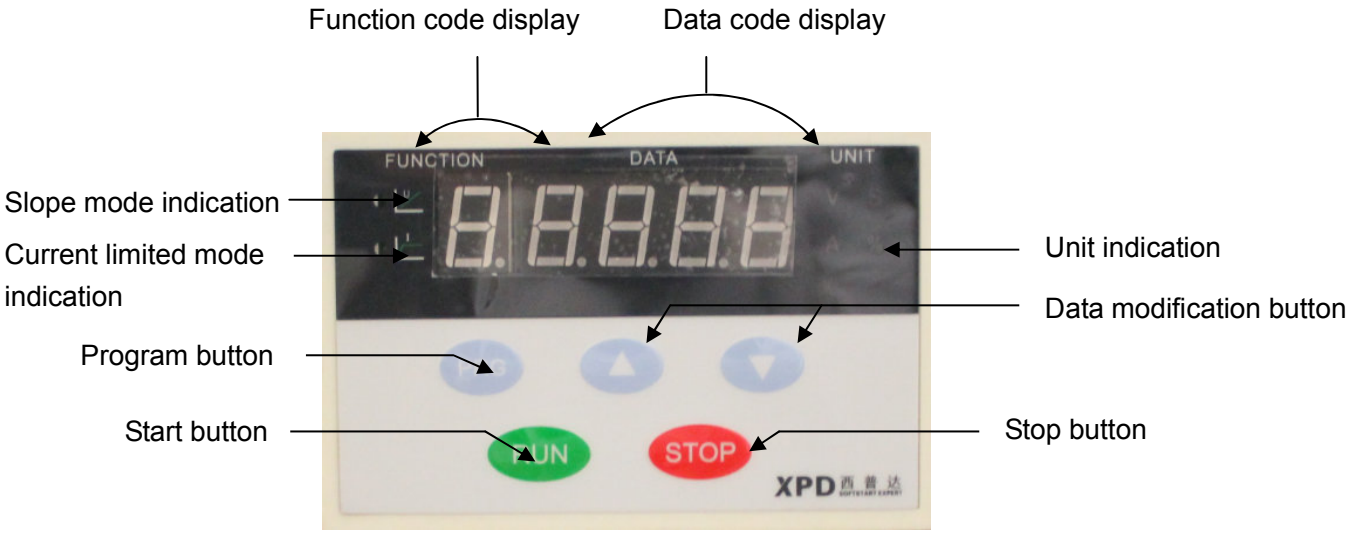



Figure 7-1

**Functional description of buttons**

There are five buttons on the keyboard box: RUN (start button), STOP (stop button), PRG (program button), ▲ (Increase button), ▼ (Decrease button).

RUN (start button): If the motor is under the ready operating mode rdy , press this button to start the motor as per pre-set mode.

STOP (stop button): The motor will be stopped and the smart soft starter will backed to the ready operating mode rdy when pressing this button if the motor is under the starting mode or the operating mode; and the smart soft starter will quit the program mode of data modifying and store data modified when pressing down this button if the smart soft starter is under the program mode of data modifying, and then the smart soft starter will come back to the ready operating mode rdy. The smart soft starter will be reset and come back to the ready operating mode rdy by pressing down this button and hold for 5s if the smart soft starter is in failure state and the failure code is displayed.

PRG (program button): Press down this button and hold for 5s and the starter will enter into the program mode if the starter is under the ready operating mode; the page turning of the different data can be realized by pressing PRG button under the program mode.

▲(Increase button): Press this button under the program mode to increase the data to be modified.

▼(decrease button): Press this button under the program mode to decrease the data to be modified.

**Note:** 1. Under the program mode, all data modified will be stored automatically when either pressing the PRG button to turn page to the next function data code mode or pressing STOP button to quit program mode after the data are modified.

2. The keyboard of the B-type product can be removed and operated after the parameters are set if exterior control operation is used.

# 8. Query and set up parameters

## 8.1 Function, display mode and setting range

See following table 8-1 for parameters that can be set and modified and the setting range of the XPD series B-type smart soft starter

| Function | Name | Setting range and meaning of parameter | Default value |
|---|---|---|---|
| F | Starting mode selection (1) | 1- Slope 2- Current limited 3-Jog | 2-Current limited |
| U | Slope initial voltage (2) | 0%-50% of electric network voltage | 25% (3) |
| d | Slope starting time | 1-120s | 30s |
| A | Starting current limited value | 100%-500% of rated current of smart soft starter | 300% (4) |
| H | Limited time of current limited start | 1-120s | 30s |
| J | Jog voltage | 0%-100% of electric network voltage | 30s |
| L | Start-stop control method | 0- Neither keyboard nor exterior control is available 1- Keyboard is available 2-exterior control is available 3- Both keyboard and exterior control are available | 1- Keyboard is available |
| C | Indication of current rated current | Vary along with adjusted power | Nominal current on nameplate |
| E | Failure display | Cannot be modified by consumer | |
| rdy | Ready operating mode | Cannot be modified by consumer | |

Note:

1. Suitable starting mode shall be selected according to characteristics of the load.
2. In order to guarantee soft starting effect of the motor, the slope initial voltage can not be set too high, and it shall be from 25% to 50% under general situations.
3. Voltage percentage is the percentage of the electric network voltage led real time.
4. Current percentage is the percentage of current rated current.
5. The start button RUN and the stop button STOP are unavailable when the start-stop control method is set as 3 and the exterior control is the two-wire control mode (see Figure 5-2 on page 7 for details).

## 8.2 Parameter query

## 8.2.1 Query current rated current

Press down ▼ button when the smart soft starter is under the ready operating mode rdy, the keyboard will display function code C, the current rated current value and data unit amperes (A) immediately. The system will come back to the ready operating mode when release the button.

**For example:** When the current rated current of soft start is of 150A.

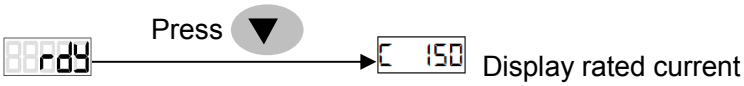



Figure 8-1

## 8.2.2 The last failure query

Press down STOP button and hold for 5s when the smart soft starter is under the ready operating mode rdy, and the keyboard display the last failure code E.The system will come back to the ready operating mode when release the button.

**For example**: The last failure is open-phase

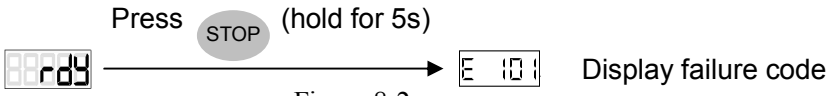



Figure 8-2

# 8.3 Parameter setting

## 8.3.1 Set up of starting mode

Press PRG button and hold for 5s (or press down PRG and ▼ button at the same time) when the smart soft starter is under the ready operating mode rdy, and then the smart soft starter will enter into the starting mode selection mode F.And then the required "starting mode code" can be selected by using the ▲ and ▼ button.

The "slope mode" indicating light on the left upper side of the operating keyboard will be illuminated when the "1" (voltage-slope start mode) is selected; the "current limited mode" indicating light on the left upper side of the operating keyboard will be illuminated when the "2" (current limited mode) is selected, and the indicating lights on the left upper side of the operating keyboard will not be illuminated when the "3" (jog operating mode) is selected.

Press PRG button again after the start operating mode selected is acknowledged to set up relevant parameters of current starting mode selected.

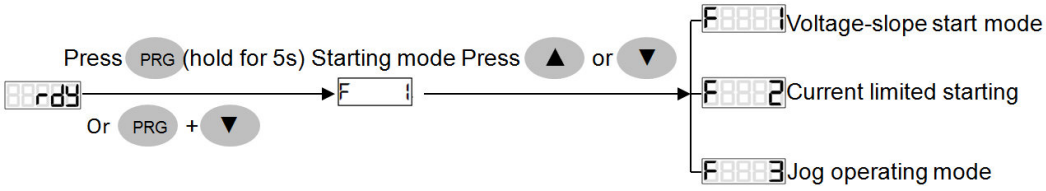



Figure 8-3

Note: As for the set up of starting mode: There are 3 modes for the B-type smart soft starter, and usually the voltage-slope start mode and the current limited starting mode are used and the consumer can select starting mode according to specific load. Two modes can be used for general load; however, as for the large inertia load it is prefer to use the voltage-slope start mode. The default of the starting mode when leaving the factory is F2, the current limited starting mode.

## 8.3.2 Set up of relevant parameters under voltage-slope start mode

The procedures for set up relevant parameters after the voltage-slope start operating mode is selected are as follows:

**For example:**

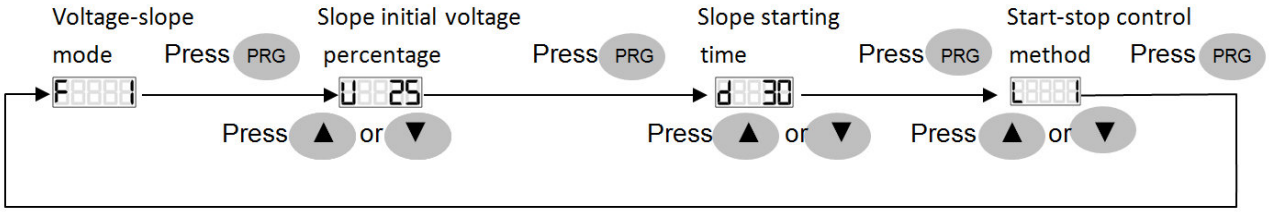



Figure 8-4

In figure 8-4

**Set up of slope initial voltage:** the setting range of the slope initial voltage is from 0% to 50% (the unit indication on the operating keyboard display V, % when setting this item).This parameter is mainly used to indicate the initial voltage Uo (the initial voltage applied on the motor) outputted by the smart soft starter at the instant of starting, and the initial starting torque of the motor will be larger if this value is higher. The default value is set at 25%.It is needn't to use large value for general load such as blower fan and pump. This value can be increased properly for the load with higher static resistance, but generally it is set between 25% and 50%.

**Set up of slope starting time**: the setting range of the slope starting time is from 1 to 120s (the unit indication on the operating keyboard display S when setting this item).This parameter is mainly used to reflect the time interval from the beginning of the starting to the end of the starting when using the voltage-slope start mode and the default value is set for 30s.This value can be set according to the property of the load and it shall be increased properly for heavy duty or load with large inertia (the starting time will be less than the set up time when the load is light and it is normal if the starting can be completed successfully).

**Set up of start-stop control method:** The control method (adopt keyboard control mode or exterior control mode) can be set according to the control method in clause 8.3.5.

**Quit set up mode:** The system will come back to the ready operating mode rdy when pressing the STOP button at any time of the above mentioned modes.

## 8.3.3 Set up of relevant parameters under current limited starting mode

The procedures for setting relevant parameters after the current limited starting mode was selected are as follows:

**For example:**

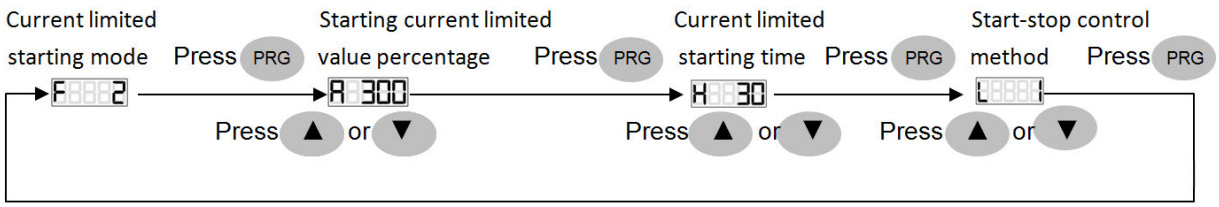


Figure 8-5

In Figure 8-5:

**Set up of the starting current limited value**: The setting range of the current limited value is from 100% to 500% (the unit indication on the operating keyboard displays A, % when setting this item).This parameter can be used to set the maximum current limited value of the starting current under the current limited starting mode, and the default value is 300%. It means that the starting current is 3 times than the rated current of the motor and can meet starting requirements of general load such as the blower fan and the pump. This value can also be adjusted according to the property of other loads, and generally the adjustment ranged from 250% to 350% is preferred.

**Set up of limited time of current limited start**: The setting range of the limited time of current limited start is from 1 to 120s, (the unit indication on the operating keyboard displays S when setting this item).This parameter means: the smart soft starter will enter into protection mode automatically if the starting time exceed limited time and the starting current is still greater than 125% of the current rated current under the current limited starting mode.

**Set up of start-stop control method:** The control method (adopt keyboard control mode or exterior control mode) can be set according to the control method in clause 8.3.5.

**Quit set up mode:** The system will come back to the ready operating mode rdy when pressing the STOP button at any time of the above mentioned modes.

## 8.3.4 Set up of relevant parameters under jog operating mode

Generally, the jog operating mode is used in the contraposition of the equipments, the judgment of the positive and reverse rotation and the balance test of the three-phase current in the operating procedure. The three-phase voltage outputted by smart soft starter is remained constant in jog operation. The procedures for set up relevant parameters after the jog operating mode is selected are as follows:

**For example:**

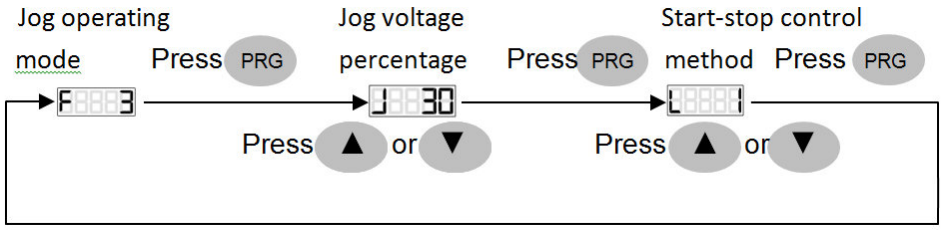



Figure 8-6

In Figure 8-6:

**Set up of jog voltage:** The setting range of the jog voltage under the jog operating mode is from 0% to 100% (the unit indication on the operating keyboard displays V, % when setting this item).

The voltage outputted by the smart soft starter remain constant (is held at set value) under the jog operating mode, and the trial run or contraposition of the equipments can be realizes easily by using this mode.

**Set up of start-stop control method:** The control method (adopt keyboard control mode or exterior control mode) can be set according to the control method in clause 8.3.5.

**Quit set up mode:** The system will come back to the ready operating mode rdy when pressing the STOP button at any time of the above mentioned modes.

## 8.3.5 Set up of control method

Start and stop of the XPD series B-type smart soft starter can be realized by using either the keyboard button or exterior button via its exterior control interface. The consumer can select set up according to requirements under either starting mode (see Figure 8-4, Figure 8-5, Figure 8-6).Use ▲ or ▼ button to select control mode you need after coming into L.

**For example:**

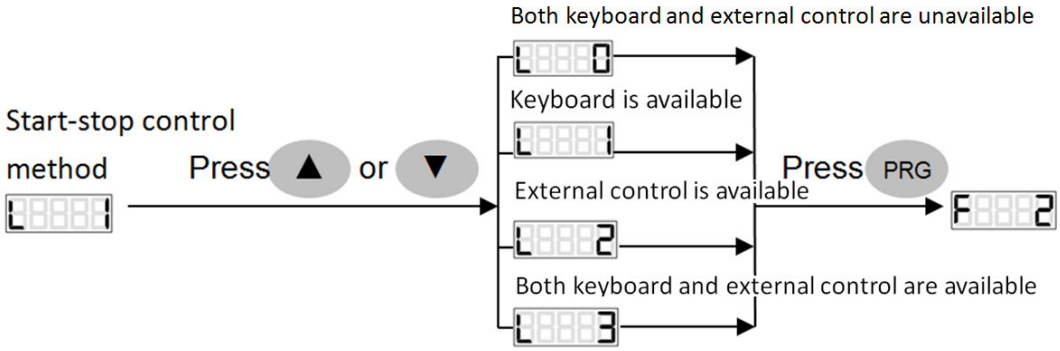



Figure 8-7

**Set up of start-stop control method**: The switch between the keyboard operation and exterior control operation can be realized by modifying the parameters, and the default is L, keyboard operation mode.

Note: Both keyboard and exterior control terminal are available when the set value is L; and the keyboard starting operation is unavailable when the wiring of the exterior control terminal is the two-wire control method (Figure 5-2).

**Quit set up mode:** The system will come back to the ready operating mode rdy when pressing the STOP button at any time of the above mentioned modes.

## 8.3.6 Adjustment and set up of rated output current

The starting current limited value of the starter can be decreased to realize new matching if the power of the motor driven by the starter is less than the nominal power value on the nameplate of the smart soft starter, and thereby the starting effect of the motor driven and the accuracy of the failure protection function can be guaranteed.

## 8.3.7 Calibration of current displayed

The current value displayed of each XPD smart soft starter has been calibrated during the debugging when leaving the factory. The current value displayed on the keyboard can be calibrated again if the consumer finds that there are any error between the actual current and the current value displayed on the keyboard during operation. Action: Set the starting mode at Jog operating mode, apply appropriate load on the motor, set the jog initial voltage at a value up to 40%, press RUN button and hold (the motor come into jog operating mode), press PRG button at the same time, and now the ▲ or ▼ button can be used to modify current value displayed on the keyboard, Make this value equal to the actual current. Release the RUN button and PRG button after modification, and hen the current parameter modified will be stored automatically.

**Description:**

►The parameter modified newly will be stored automatically whether either the PRG button is pressed to turn page or the STOP button is pressed to come back to the ready operating mode rdy when modifying each parameter.

►The system will come back to the ready operating mode  if the STOP button is pressed at any state of parameter displaying mode when modifying the parameters.

# 9. Description of failure display and resolutions

| Failure display | Failure description and resolutions |
|---|---|
|  | Set up mistake of consumer parameters. The keyboard will display this information if there are any mistakes of the parameters set by the consumer when the smart soft starter is powered on and carry out self checking. The system will restore all parameters to default values automatically under such circumstances.<br>**Resolutions:** The consumer shall set up the parameters again, for all parameters have been restored to the default values. |
|  | Open-phase of input voltage. The system will monitor open-phase conditions through all operating modes, and will take protection actions in 120ms when finding open-phase of input voltage.And display this information.<br>**Resolutions:** check the input power supply to see if there are any open-phase conditions. |
|  | The current exceed limited value. The system can block the triggering signal of the controllable silicon in a level of microsecond and enter into failure protection mode if sudden heavy current (the motor is blocked) of which the peak value is greater than the peak value of the rated current for more than six times occurs during the starting process of the motor, and display this information.<br>**Resolutions:** Check the load or mechanical transmission to see if it can operate fluently. |
|  | Overheating of the smart soft starter: The system monitors the temperature of the radiator of the controllable silicon module continually and will activates the system protection function in 3s, and then displays this information.<br>**Resolutions**: Check the load to see if it is too heavy or the number of starts is too many. |
|  | Starting time exceed limited value. The system will enter into the failure protection mode in 3s if the actual starting time of the motor exceeds the slope starting time set by the consumer and the starting current is no less than 125% of the rated current set currently when the voltage-slope starting mode is used; or the system will enter into the failure protection mode if the starting current is still greater than 125% of the rated current set currently after the actual starting time of the motor exceeds the limited time of current limited starting set by the consumer. And the system will display this information.<br>**Resolutions:** Check the load to see if it is too heavy or the time set is too short. |

Note:

1. See "Clause 8.2.2 the last failure query" for method to query record of the last failure codes.
2. The system can be reset by using one of three methods when failure occurs.

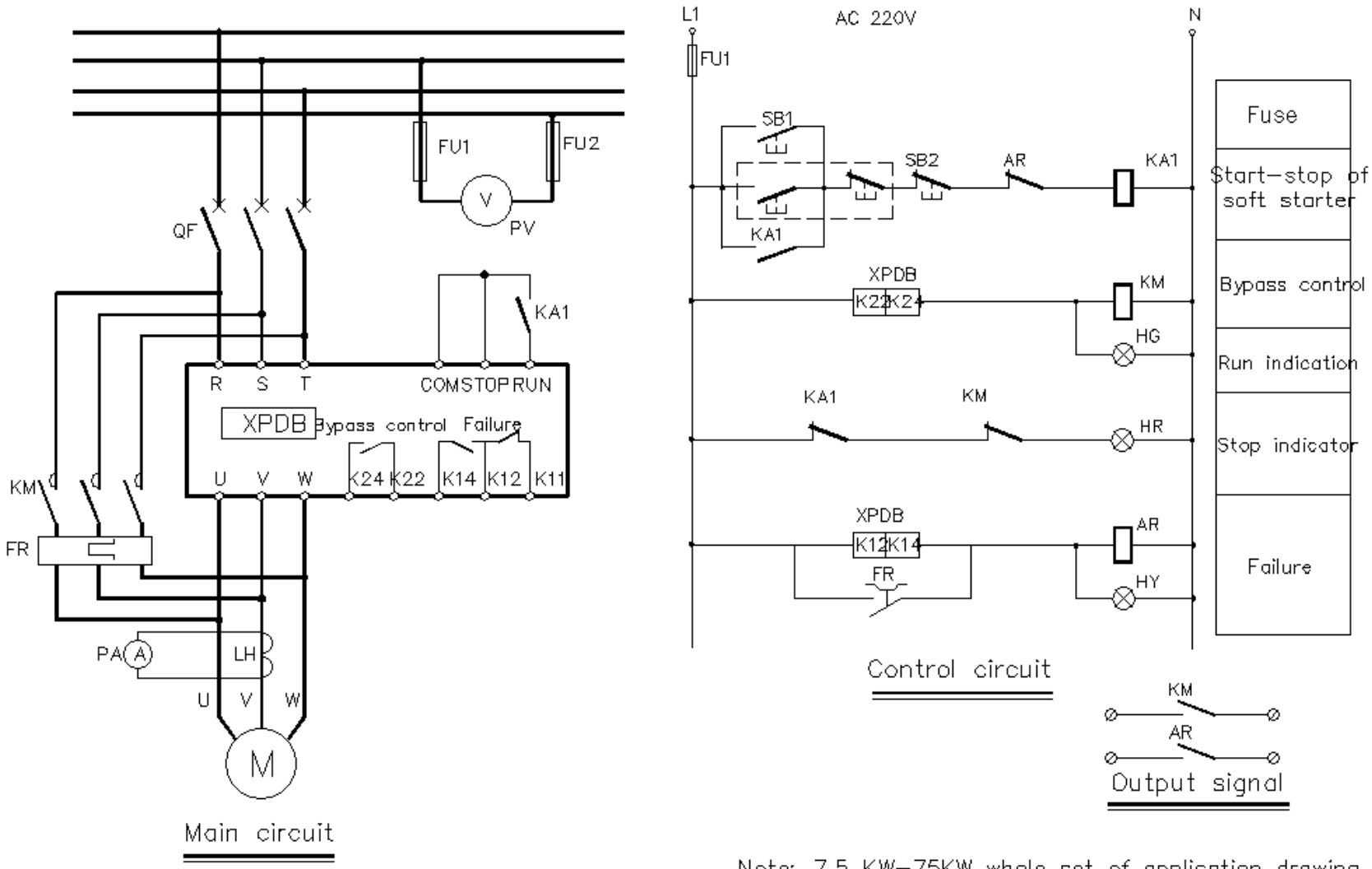
►Press STOP button and hold for 5s.

►Short-circuit the exterior control terminal RET with the COM and hold for 5s.

►Switch off the smart soft starter and switch on it again.

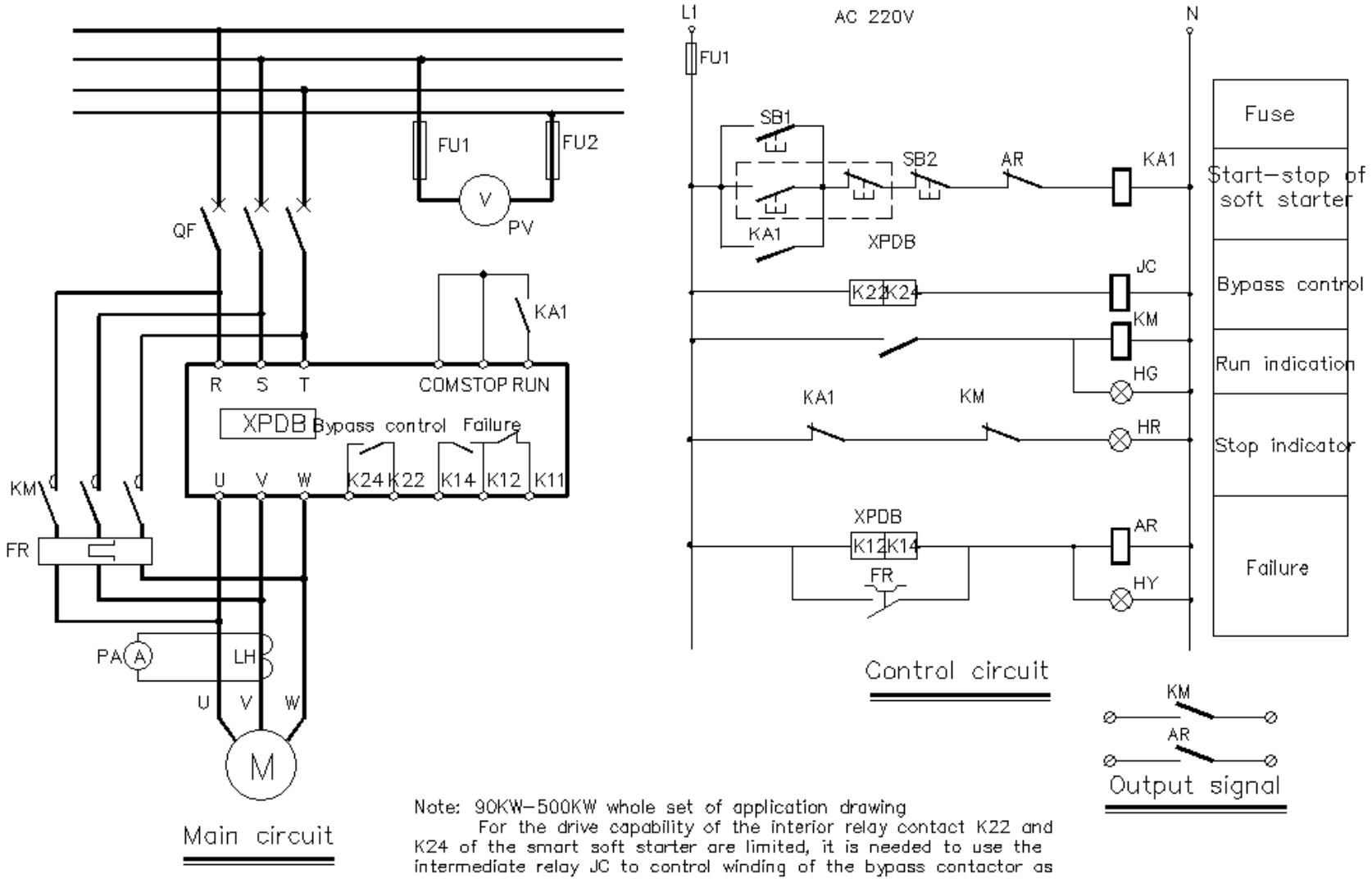
## 10. Representative wiring diagram of XPD series B-type application

## 10.1 Wiring diagram of control cabinet applicable to soft starting up to 75KW (include)




Note: 7.5 KW—75KW whole set of application drawing.

## 10.2 Wiring diagram of control cabinet applicable to soft starting with power of 90KW and above




Note: 90KW–500KW whole set of application drawing
For the drive capability of the interior relay contact K22 and K24 of the smart soft starter are limited, it is needed to use the intermediate relay JC to control winding of the bypass contactor as for the smart soft starter with power of 90KW and above.

Figure 10-2

# 11. Trial run

## 11.1 Inspection before operation

In order to guarantee safety operation, following items shall be followed to inspect the system before switching on the power supply.

▲Is the power of the smart soft starter match with the power of the motor?

▲Does the insulation of the motor meet the requirements?

▲Are the input and output wiring of the main circuit correct?

▲Are all nuts of wiring tightened?

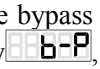
▲Are wiring of the bypass contactor correct?

▲Are there any short circuit phenomena when using the multimeter to inspect three-phase inlet power supply (R. S. T.)?

## 11.2 Power on and operation

▲The smart soft starter will enter into "ready operating mode" when power on and display  (see "Description of failure display and resolutions" if the content displayed is not correct).

▲The jog function can be used to judge the balance of the three-phase output current when the keyboard display is normal, and the specific operation are as follows:

1. Set the starting mode on  and the control mode on  ;
2. Press RUN button and use tong-type ammeter to check the three-phase output current of the smart soft starter to see if they are balance or not (the motor may not rotate because the voltage is low, and it is the normal phenomena).
3. The motor can be started and stopped if above mentioned tests are normal. Press RUN button to start the motor and the bypass contactor will be switched to operate after the starting is completed, and now the keyboard shall display  , and then the motor operate normally. The motor can be stopped by pressing STOP button

## 11.3 Matters need attention and security in trial run

►The failure protection codes will be displayed if the failure protection is activated during whole power on process and operation procedure, see "Description of failure display and resolutions" for details and the relevant prompts shall be followed to handle the matters.

►Do not open the housing of the smart soft starter after power on to avoid electric shock.

►The starter and the motor shall be switched off immediately during the trial run to find out the problems if there are any abnormal phenomena such as abnormal sound, smoke or peculiar smell.

►There are induced voltage of 380V on the three-phase U.V.W when the smart soft starter is switched on while the outputs of the smart soft starter are not connected with the motor. This is the normal phenomenon and the induced voltage will disappear after the outputs of the smart soft starter are connected with the motor.

►The parameters can be modified according to the starting mode, the current, the voltage and the time in the table 8-1 if the starting state of the motor is not ideal in the trial run.

# 12. Specifications and model

| Applicable power of motor (kw) | 380V series | |
|---|---|---|
| | Rated current（A） | XPD series B-type |
| 7.5 | 18 | XPD008B-3 |
| 15 | 30 | XPD015B-3 |
| 22 | 45 | XPD022B-3 |
| 30 | 60 | XPD030B-3 |
| 37 | 75 | XPD037B-3 |
| 45 | 90 | XPD045B-3 |
| 55 | 110 | XPD055B-3 |
| 75 | 150 | XPD075B-3 |
| 90 | 180 | XPD090B-3 |
| 110 | 220 | XPD110B-3 |
| 132 | 260 | XPD137B-3 |
| 160 | 320 | XPD160B-3 |
| 187 | 395 | XPD187B-3 |
| 200 | 400 | XPD200B-3 |
| 250 | 480 | XPD250B-3 |
| 280 | 550 | XPD280B-3 |
| 320 | 620 | XPD320B-3 |
| 400 | 720 | XPD400B-3 |
| 450 | 850 | XPD450B-3 |
| 500 | 1000 | XPD500B-3 |

**Ordering instructions**

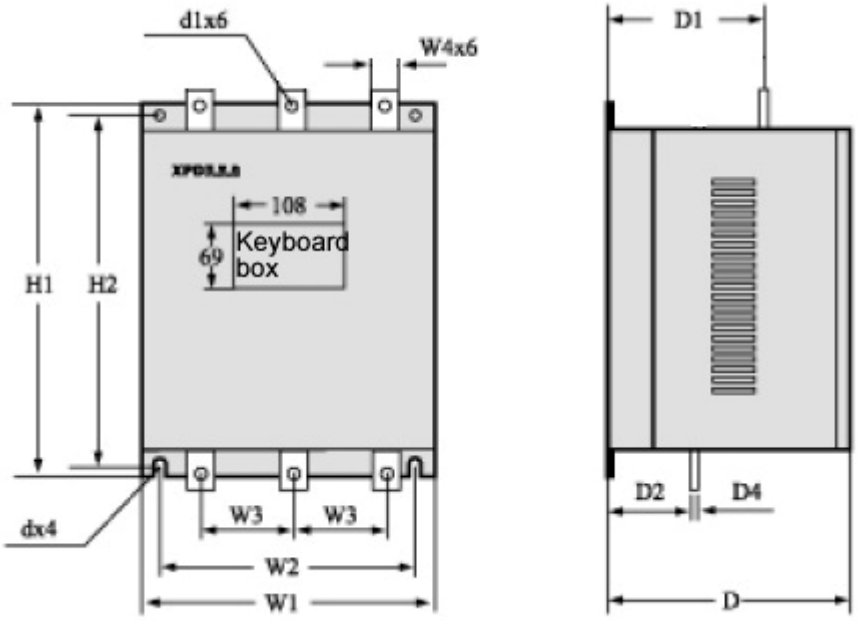
►Please notify the supplier of the model, specifications, loading conditions and operating conditions of the product in ordering for selecting the products correctly.

►The XPD series B-type products shall be equipped with the bypass contactor and the motor protective device in operation.

►As for consumers with particular operating conditions or requirements, those special operating conditions or requirements shall be specified to the supplier and we will do our best to offer sound service.

# 13. Installation mode and overall dimension

| Type and specification | Overall dimension (mm) | | | Installation dimension (mm) | | | | | Copper bars dimension (mm) | | | | weight(kg) | Installation mode |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | W1 | H1 | D | W2 | H2 | D1 | D2 | d | W3 | W4 | D4 | d1 | | |
| XPD008B-3～XPD075B-3 | 206 | 285 | 182 | 146 | 269 | 132 | 75 | Φ6 | 63 | 20 | 3 | Φ9 | 8 | Wall hanging type Figure |
| XPD090B-3～XPD160B-3 | 260 | 463 | 213 | 229 | 443 | 143 | 61 | Φ9 | 77 | 30 | 5 | Φ10 | 22 | |
| XPD187B-3～XPD320B-3 | 300 | 490 | 243 | 260 | 470 | 170 | 57 | Φ9 | 91 | 40 | 5 | Φ11 | 35 | |
| XPD400B-3～XPD500B-3 | 482 | 530 | 310 | 400 | 505 | 230 | 55 | Φ11 | 150 | 50 | 6 | Φ11 | 45 | |



# 14. Keyboard display mode comparison table of XPD series B-type smart soft starter

| | | | |
|---|---|---|---|
| Mode display | rdy | Ready operating mode (normal readiness for action after power on) | Page10 |
| | b-P | Bypass operating mode (bypass contactor is putted into service after the start was completed) | Page10 |
| Function Display | F | setting mode of starting mode. | Page13 |
| | U | Initial voltage setting mode under slope starting mode. | |
| | d | Slope starting time setting mode under slope starting mode. | |
| | A | Current limited setting mode under current limited starting mode. | |
| | H | Current limited starting time setting mode under current limited starting mode. | |
| | J | Jog voltage setting mode under jog operating mode. | |
| | L | Start-stop control method selection | |
| | C | Indication of current rated current | |
| Failure display | E100 | Set up mistake of consumer parameters. | Page18 |
| | E101 | open-phase of input voltage. | |
| | E102 | current exceeds limited value. | |
| | E103 | Overheating of soft starter | |
| | E104 | Starting time exceeds limited value | |

# 15. Product warranty card

Sincerely thanks for your purchasing products of Xipuda Electronics Technology Company!
This product has passed the strict quality inspection by our company。According to this card warranty，All caused by the product itself quality problem in the normal use of failure， As long as during the warranty period, we will be responsible for free maintenance。

| | | | |
|---|---|---|---|
| Product Type: | | manufacturing number: | |
| Warranty period: | | | |
| Purchasing date: | year | month | day |
| Invoice number: | | | |
| | | | |
| User name:<br>(or company name) | | | |
| Address: | | | |
| Postcode: | Tel: | Fax: | |
| Dealer name: | | | |
| Address: | | | |
| Postcode: | Tel: | Fax: | |
| Dealer stamp: | | | |

# 16. Customer feedback form

Honorific customers：for the convenience of better service for you，please fill out the form below：

<table>
<tr><td colspan="6">The load and The control</td></tr>
<tr><td>Motor power and number of poles</td><td></td><td>Motor rated current</td><td></td><td>Normal work frequency range</td><td></td></tr>
<tr><td>Load type</td><td colspan="5"></td></tr>
<tr><td>Control mode</td><td colspan="5"></td></tr>
<tr><td colspan="6">Fault phenomenon</td></tr>
<tr><td>Fault time</td><td colspan="5">☐Electric jump on fault ☐Malfunction jump<br>☐Run for a period of time of failure ☐Jump start failure</td></tr>
<tr><td colspan="6">Fault type</td></tr>
<tr><td>Circuit board failure</td><td colspan="5">☐Electricity no display ☐Electricity smoke ☐Relay don’t pick-up</td></tr>
<tr><td>Keyboard failure</td><td colspan="5">☐ The key failure ☐parameters cannot be modified<br>☐ Display lack of pen</td></tr>
<tr><td>Abnormal output</td><td colspan="5">☐ Non voltage output ☐Output voltage imbalance ☐High vibration of motor<br>☐ Translate power abnormally from motor</td></tr>
<tr><td colspan="6">If the problem is not above column, please describe below:</td></tr>
<tr><td colspan="6">Fault description:</td></tr>
</table>

# 17. Product information feedback

Honorific customers：
Thanks for your concerning and purchasing our products of XIPUDA ELECTRONICS TECHNOLOGY,.LTD。for better service，we kindly hope to get the information about you and the product which you purchase，that for learning about your further requirement and getting your precious feedback。 for the convenience of getting our service，please visit our company website：http://www.wxwestpow.com.cn

1. Download the updated product introduction
2. Refer to all kinds of technical data of products，such as usage，specification and performance，common problem and so on
3. Product application case sharing
4. Technical problems consulting and feedback online
5. Tell us the use information and customer demand information by email
6. Query the latest products，receiving all kinds of warranty and extend additional services

# Record