# B603 Series
# Intelligent Constant Pressure Water Supply Controller
# User Manual




7430085 v.1

# Preface

Thanks for choosing our product, we will supply you with considerate service as well as ever.

With high quality, multi-functional, low noise and strong commonality etc. characteristics, B603 multi-function energy-saving controller is suitable to full-automatic operation.

- Professional design based on users' needs, simplicity of operation and suitable for all kinds of applications;
- According to the water condition to supply constant pressure water without manual operation after parameters were set correctly;
- Stop running automatically when no water consumption;
- Alarm automatically when faults occurred;
- Alternate running automatically in the multiple pump system, prolong the using life of pumps.

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# 1. SAFETY PRECAUTIONS

B603 is a new power electronic product, please read the operation manual carefully before using to keep your safety and make sure proper operation.

In this manual, the safety precautions were sorted to **"WARNING"** and **"CAUTION"**.

**WARNING:** Wrong using may result in death or serious personal injury.

**CAUTION:** Wrong using may result in the damage of controller or system.

| **WARNING** |
|---|
| ● Please don't dismantle, change the product, or may cause electric shock, fire hazard and personal injury;<br>● Please don't open the cover during the running of controller;<br>● Please don't put wire, bar of metal, filaments etc. into the controller so as not to cause a short circuit or get an electric shock;<br>● Please don't splash water or other liquid over the controller. |

| **CAUTION** |
|---|
| ● Please don't make withstand voltage testing for the controller;<br>● Never connect AC power to output UVW terminals;<br>● If the internal components of the controller were influenced or damaged by static, please do not to touch;<br>● The motor, controller and power specifications should be matching, otherwise it could cause abnormal operation even burn out the device;<br>● If the controller appears serious vibration, noise, heat or peculiar smell in the first operation, please cut off the power immediately and contact suppliers or service center later;<br>● Please don't install the controller in the environment with direct sunlight, rain, frost or snow in case of deformation or damage. |

**Warm reminder:**

For convenience, the controller has set default with a nonzero AI1 feedback lost detecting value, if here hasn't pressure signal feedback into the terminal AI1, the controller will be starting up failure and displaying "E022", just take follows:

◊ If the controller worked as a master, please connect a transducer to the controller and then press the STOP/RST key;

◊ If it worked as an auxiliary, it should be setting as AI1 feedback lost detecting value (b02.08) 0 and then pressing the STOP/RST key to reset error warning.

# 2. PRODUCT INTRODUCTION

## 2.1 Features

### ● Input & Output

- ◆Input Voltage Range: 220/380V±15%
- ◆Input Frequency Range: 47~63Hz
- ◆Output Voltage Range: 0~rated input voltage
- ◆Output Frequency Range: 0~50/60Hz

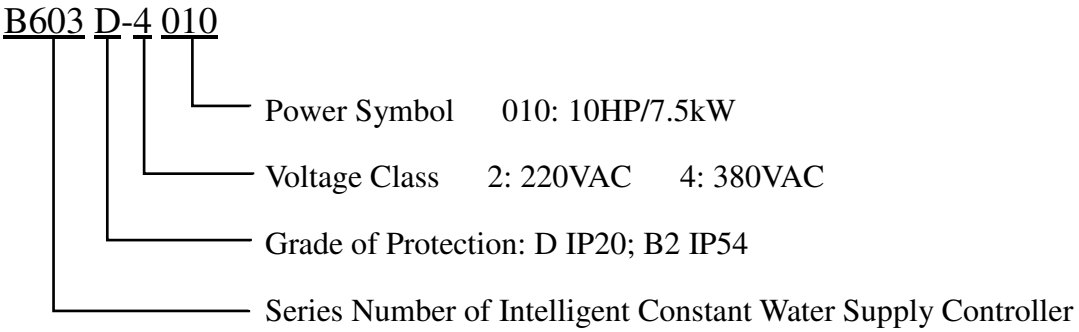
### ● I/O Features

- ◆Digital Switch Input: 3 input
- ◆Analog Signal Input: AI1: 0~10V or 0~20mA input; AI2: 0~10V or 0~20mA input
- ◆Relay Output: A pair of switch Output

### ● Function Characteristics

- ◆Multi-Pump Control: Can realize 1 master and Max.5 auxiliaries combine work
- ◆Sleep Function: Sleep down when have no water consumption, to earn a better energy saving
- ◆Freeze-Proofing Function: Suitable to low temperature area, prevent pump from freezing
- ◆Anti-clogging Function: Take precaution against pipe clogging and clean the pipe dirt
- ◆Power On Restart: Running automatically when power on
- ◆Master Fault Shift Automatically: Keep on working when the master break down
- ◆Alternate Running: Balance every pump's running time, prolong service life of the whole unit machine
- ◆Day-Part Function: 3 independent day-part control, up to 7 day-part achieved when define separated
- ◆Two Running Mode: Synchronous control mode, master-slave control mode
- ◆Terminal Control Mode: Terminal Run/Stop, Manual/Auto Control, Electronic Contact Gauge Control
- ◆Various of water supply Fault Alarm Function: High-Pressure, Low-Pressure, Low-Level, Transducer Error etc.
- ◆As many as 22 kinds of fault protection function: Over-Current, Over-Voltage, Low-Voltage, Phase-Failure, Over-Load etc.

## 2.2 Model Specification



## 2.3 Selection Guide

Table2.3.1 B603 list

| Model No. | Rated Input Voltage (V) | Input Current (A) | Max. Output Current (A) | Motor Power (kW) |
|---|---|---|---|---|
| B603D(B2)-2001 | 1AC: 220V -15%~+15% | 8.2 | 4.5 | 0.75 |
| B603D(B2)-2002 | | 14.2 | 11.0 | 1.5 |
| B603D(B2)-2003 | | 23.0 | 15.0 | 2.2 |
| B603D-2001 | 3AC: 220V -15%~+15% | 5.0 | 4.5 | 0.75 |
| B603D-2002 | | 7.7 | 7.0 | 1.5 |
| B603D-2003 | | 11.0 | 10.0 | 2.2 |
| B603D(B2)-2005 | | 17.0 | 16.0 | 3.7 |
| B603D(B2)-2007 | | 21.0 | 20.0 | 5.5 |
| B603D-2010 | | 31.0 | 30.0 | 7.5 |
| B603D-2015 | | 43.0 | 42.0 | 11 |
| B603D-2020 | | 56.0 | 55.0 | 15 |
| B603D-2025 | | 71.0 | 70.0 | 18.5 |
| B603D-2030 | | 81.0 | 80.0 | 22 |
| B603D-2040 | | 112.0 | 110.0 | 30 |
| B603D-2050 | | 132.0 | 130.0 | 37 |
| B603D-2060 | | 163.0 | 160.0 | 45 |
| B603D-2075 | | 200.0 | 200.0 | 55 |
| B603D(B2)-4001 | 3AC: 380V -15%~+15% | 3.4 | 2.5 | 0.75 |
| B603D(B2)-4002 | | 5.0 | 3.7 | 1.5 |
| B603D(B2)-4003 | | 5.8 | 5.0 | 2.2 |
| B603D(B2)-4005 | | 10.0 | 9.0 | 4.0 |
| B603D(B2)-4007 | | 15.0 | 13.0 | 5.5 |
| B603D(B2)-4010 | | 20.0 | 17.0 | 7.5 |
| B603D(B2)-4015 | | 26.0 | 25.0 | 11 |
| B603D(B2)-4020 | | 35.0 | 32.0 | 15 |
| B603D-4025 | | 38.0 | 37.0 | 18.5 |
| B603D-4030 | | 46.0 | 45.0 | 22 |
| B603D-4040 | | 62.0 | 60.0 | 30 |
| B603D-4050 | | 76.0 | 75.0 | 37 |
| B603D-4060 | | 90.0 | 90.0 | 45 |
| B603D-4075 | | 105.0 | 110.0 | 55 |
| B603D-4100 | | 140 | 150 | 75 |
| B603D-4120 | | 160 | 176 | 90 |
| B603D-4150 | | 210 | 210 | 110 |
| B603D-4180 | | 240 | 250 | 132 |
| B603D-4215 | | 290 | 300 | 160 |
| B603D-4250 | | 330 | 340 | 185 |
| B603D-4270 | | 370 | 380 | 200 |
| B603D-4300 | | 410 | 415 | 220 |

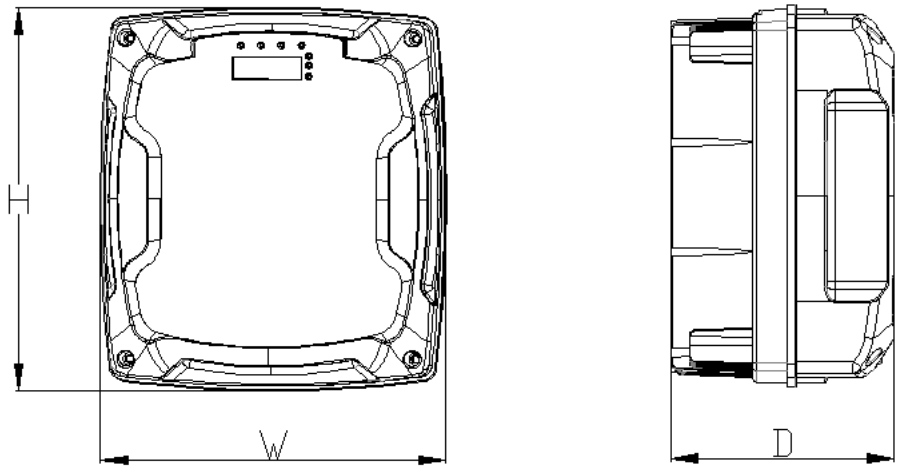
| Model No. | Rated Input Voltage (V) | Input Current (A) | Max. Output Current (A) | Motor Power (kW) |
|---|---|---|---|---|
| B603D-4340 | | 460 | 470 | 250 |
| B603D-4380 | | 500 | 520 | 280 |
| B603D-4430 | | 580 | 600 | 315 |
| B603D-4470 | | 620 | 640 | 350 |

## 2.4 Check the Following Point

- Inspect the nameplate and ensure it meets the order type and specification;
- Inspect the entire exterior of the controller to ensure there are no scratches or other damage caused by the transportation;
- Ensure the guarantee odd number matches the controller;
- If you have found any problem mentioned above, please contact the supplier.

## 2.5 External Dimension

1. The dimension of B603B2




| Model (kW) | A (mm) | B (mm) | H (mm) | W (mm) | D (mm) | Installation Hole |
|---|---|---|---|---|---|---|
| | Installation Dimension | | External Dimension | | | |
| 0.75~2.2 (B2 models) | - | - | 216 | 195 | 154 | - |
| 4~7.5 (B2 modes) | - | - | 282 | 255 | 165 | - |
| 11-15 (B2 models) | - | - | 370 | 350 | 221 | - |

## 2. The dimension of B603D

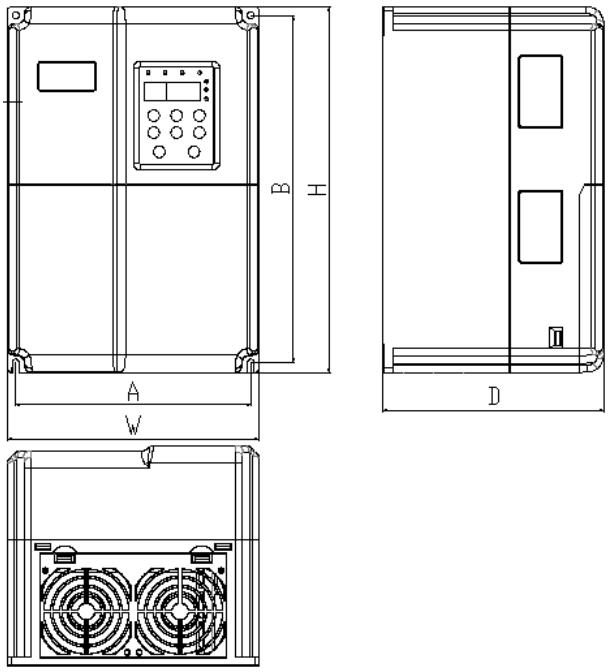



Figure2.5.1 Dimension (0 .75~18.5kW)

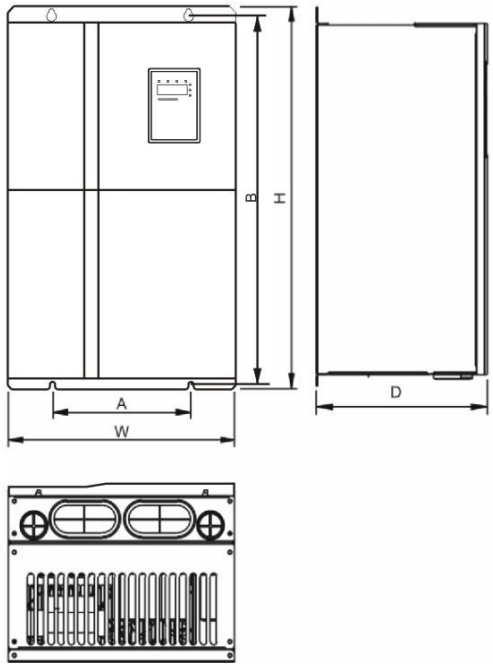



Figure 2.5.2 Dimension (22~132kW)

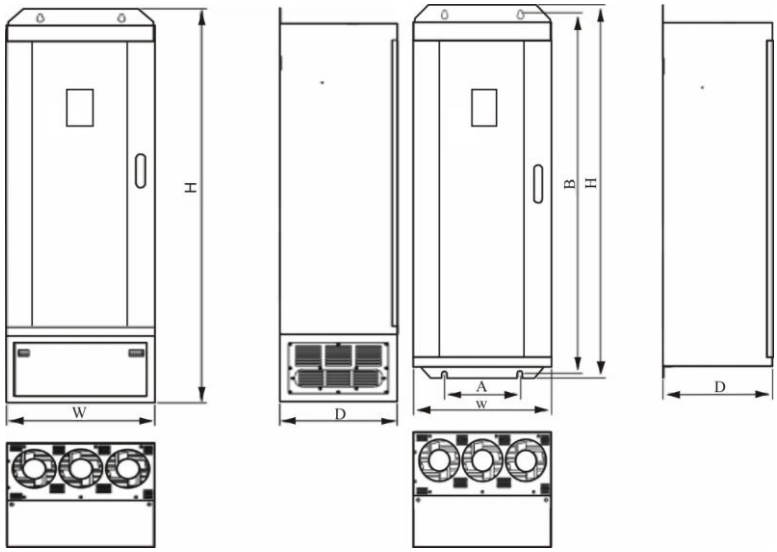



Figure 2.5.3 Dimension (160~350kW)

| Model (kW) | A (mm) | B (mm) | H (mm) | W (mm) | D (mm) | Installation Hole |
|---|---|---|---|---|---|---|
| | Installation Dimension | | External Dimension | | | |
| 0.75~2.2 | 110 | 169.6 | 179.6 | 120.1 | 150.3 | 4.0 |
| 4~7.5 | 147.4 | 236 | 250 | 160 | 194.5 | 5.0 |
| 11~18.5 | 205.6 | 303.6 | 320 | 220 | 193.5 | 6.0 |
| 22~37 | 175 | 455 | 472 | 295 | 222 | 6.5 |
| 45~75 | 230 | 564.5 | 580 | 380 | 270 | 7.0 |
| 90~132 | 320 | 738.5 | 755 | 465 | 330 | 9.0 |
| 160~200 (Without base) | 270 | 1233 | 1275 | 490 | 395 | 13.0 |
| 160~200 (With base) | | | 1490 | 490 | 395 | |
| 220~350 (Without base) | 500 | 1324 | 1358 | 750 | 402 | 12.5 |
| 220~350 (With base) | | | 1670 | 750 | 402 | |

# 3. ENVIRONMENTAL REQUIREMENT

1. Environment temperature range: -10℃~+40℃. Controller will be derated if ambient temperature exceeds 40℃.
2. Prevent rain drops, moist environment, oil fog, salt erosion, corrosive gas, etc..
3. Prevent direct sunlight, keep away from radiation source.
4. Prevent violent vibration or sudden impact.
5. Lower than 1000m installation altitude, it will be derated when the altitude is higher than 1000m.

**⚠ CAUTION**

- When moving the controller please lift by its base and don't lift by the panel. Otherwise may cause the main unit fall off which may result in personal injury.
- Install the controller on the fireproofing material (such as metal) to prevent fire.
- When power off, should not install the controller until the power indicator light was extinguished, which can ensure the device has been discharged completely.
- Disconnect all power line before opening front cover of unit. Wait at least 5 minute until DC Bus capacitors discharge.

# 4. WIRING

## 4.1 Main Circuit Terminals Wiring

1. The main circuit terminals wiring of B603B2 (220VAC)

| PE | R（L） | S（N） | T | | U | V | W | PE |
|---|---|---|---|---|---|---|---|---|
| | POWER | | | | MOTOR | | | |

Figure 4.1.1 The main circuit terminals wiring of B603B2 (0.75-2.2kW)

| (+) | (-) | PB | R | S | T | PE | U | V | W | PE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | POWER | | | | MOTOR | | | |

Figure 4.1.2 The main circuit terminals wiring of B603B2 (3.7-5.5kW)

2. The main circuit terminals wiring of B603B2 (380VAC)

| PE | R | S | T | | U | V | W | PE |
|---|---|---|---|---|---|---|---|---|
| | POWER | | | | MOTOR | | | |

Figure 4.1.3 The main circuit terminals wiring of B603B2 (0.75-2.2kW)

| (+) | (-) | PB | R | S | T | PE | U | V | W | PE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | POWER | | | | MOTOR | | | |

Figure 4.1.4 The main circuit terminals wiring of B603B2 (4.0-7.5kW)

| PE | (+) | PB | (-) | R | S | T | U | V | W | PE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | POWER | | | MOTOR | | | |

Figure 4.1.5 The main circuit terminals wiring of B603B2 (11~15kW)

3. The main circuit terminals wiring of B603D (220VAC)

| | | L | N | | U | V | W | |
|---|---|---|---|---|---|---|---|---|
| | | AC220V | | | MOTOR | | | ⏚ |

Figure 4.1.6 The main circuit terminals wiring of B603D (0.72~2.2kW)

| (+) | | (-) | R | S | T | U | V | W | ⏚ |
|---|---|---|---|---|---|---|---|---|---|
| | | | AC220V | | | MOTOR | | | |

Figure 4.1.7 The main circuit terminals wiring of B603D (3.7~5.5kW)

| ⏚ | (+) | | (-) | R | S | T | U | V | W | ⏚ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | POWER | | | MOTOR | | | |

Figure 4.1.8 The main circuit terminals wiring of B603D (7.5kW)

4. The main circuit terminals wiring of B603D (380VAC)

| (+) | | R | S | T | U | V | W | |
|---|---|---|---|---|---|---|---|---|
| | | POWER | | | MOTOR | | | ⏚ |

Figure 4.1.9 The main circuit terminals wiring of B603D (0.72~2.2kW)

| (+) | | (-) | R | S | T | U | V | W | ⏚ |
|---|---|---|---|---|---|---|---|---|---|
| | | | POWER | | | MOTOR | | | |

Figure 4.1.10 The main circuit terminals wiring of B603D (4.0~7.5kW)

| ⏚ | (+) | | (-) | R | S | T | U | V | W | ⏚ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | POWER | | | MOTOR | | | |

Figure 4.1.11 The main circuit terminals wiring of B603D (11~18.5kW)

| ⏚ | R | S | T | P1 | (+) | (-) | U | V | W | ⏚ |
|---|---|---|---|---|---|---|---|---|---|---|
| | POWER | | | | | | MOTOR | | | |

Figure 4.1.12 The main circuit terminals wiring of B603D (22~110kW)

5. Main circuit terminal's function as following:

| Terminal Symbol | Function Description |
|---|---|
| L, N | Terminals of single phase AC input |
| U, V, W | Motor wiring terminal |
| PE/⏚ | Terminals of ground |
| R, S, T | Terminals of 3 phase AC input |
| (+), (-) | Reserved external terminals for braking units |
| (+), PB | Reserved external terminals for braking resistance |
| P1, (+) | Reserved external terminals for braking DC reactors |
| (-) | Output terminals for minus DC bus voltage |

In order to keep safety and prevent electric shock and fire, PE must be grounded with ground resistance. Furthermore, reliable grounding is the simplest, most effective and minimum cost solution for EMC problems, so it enjoys priority in all EMC methods.

## 4.2 Control Circuits Terminals Wiring

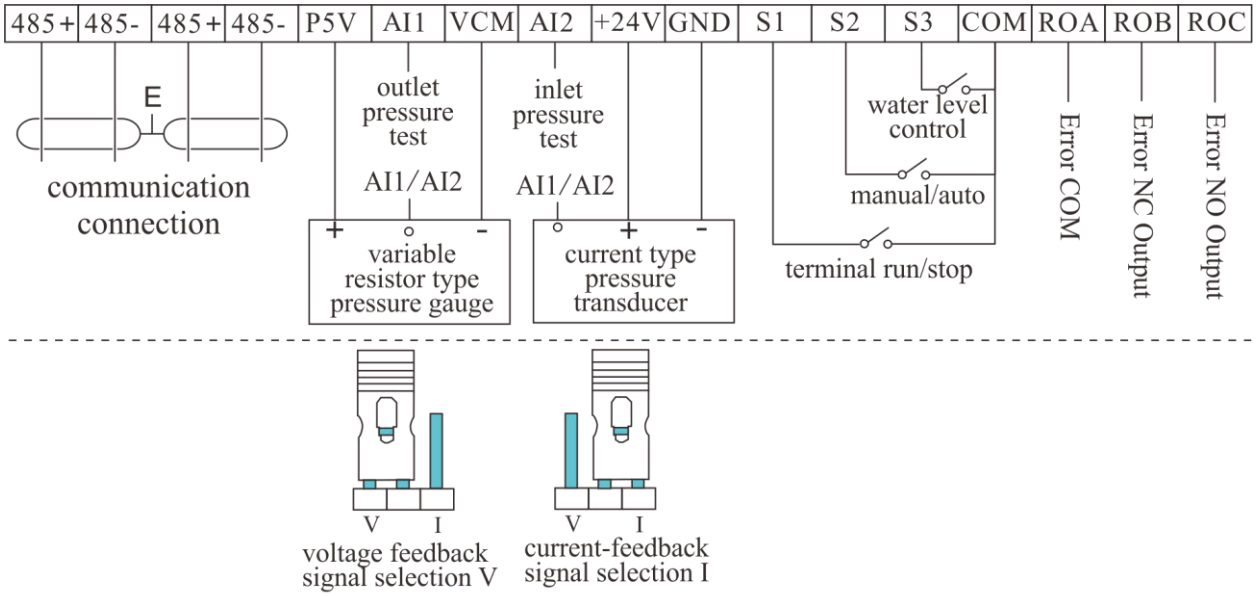



Figure 4.2.1 Control circuits terminals wiring

## 4.3 Control Terminals Overall Connect

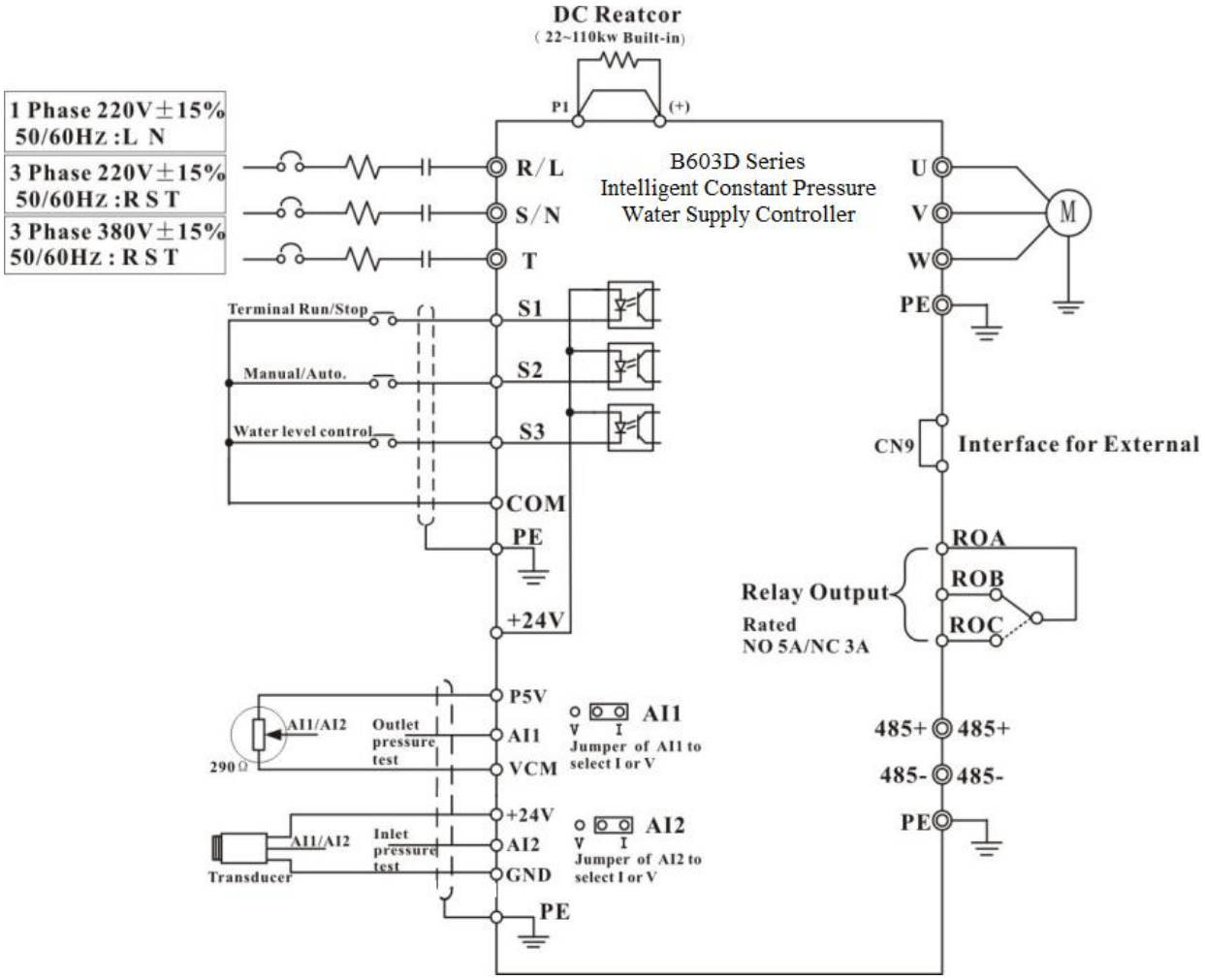



Figure 4.3.1 Wiring diagram

## 4.4 Wiring Main Circuits

### 4.4.1 Wiring of Main Circuits

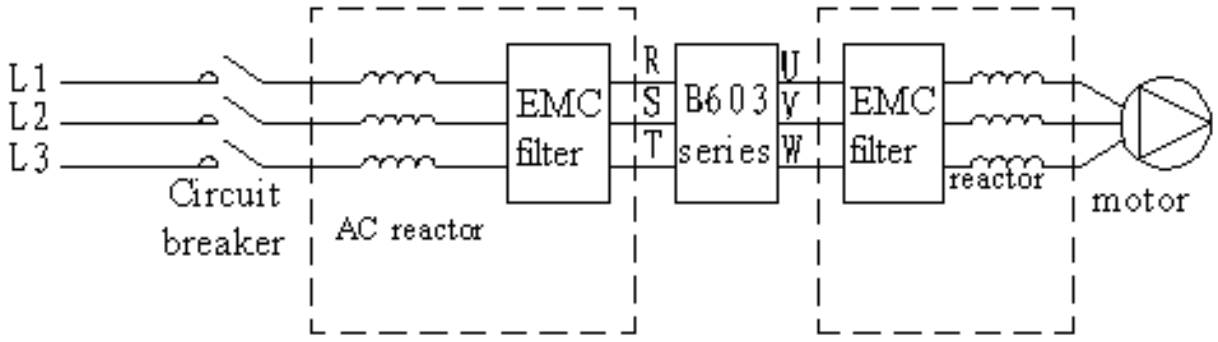



Figure4.4.1 High-performance main circuit wiring

### 4.4.2 Circuit Breaker

It is necessary to connect a suitable circuit breaker between 3 phase AC power supply and B603 series intelligent constant water supply controller. The capacity of breaker is 1.5~2 times to the rated current of controller.

### 4.4.3 AC Reactor (Optional)

In order to prevent the rectifier damage resulted from the large current, AC reactor should be installed at the input side. It can also prevent rectifier from sudden variation of power voltage or harmonic generated by phase-control load.

### 4.4.4 Input EMC Filter (Optional)

EMC filter can minimize the interference of the surrounding device which may be disturbed by the cables when the controller is working.

### 4.4.5 Output EMC Filter (Optional)

EMC filter should be installed to minimize the leak current caused by the cable and minimize the radio noise caused by the cables between the controller and motor.

### 4.4.6 Output Reactor

When the distance between the B603 controller and motor is more than 50m, the controller may be tripped by over-current protection frequently because of the large leak current resulted from the parasitic capacitance with ground. So as to avoid the damage of motor insulation, the output reactor should be installed.

### 4.4.7 Ground Wiring (PE)

In order to keep safety and prevent electric shock and fire, PE must be grounded with ground resistance. Furthermore, reliable grounding is the simplest, most effective and minimum cost solution for EMC problems, so it enjoys priority in all EMC methods.

# 5. OPERATION

## 5.1 Keypad Description

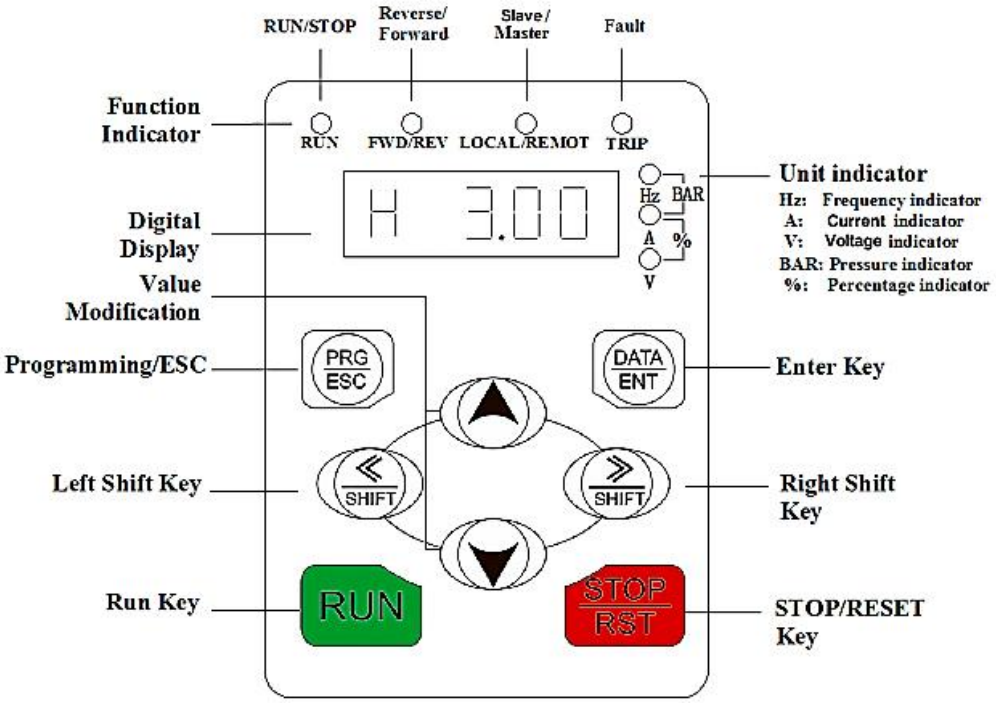



Figure5.1.1 Keypad schematic diagram

## 5.2 Operation Procedure

### 5.2.1 Add Prefix Characters Display Content for Easy Understanding

H: Operating Frequency

P: The Actual Pressure of Pump Outlet

L: The Setting Pressure of Pump Outlet

A: Output current

d: DC Bus Voltage

U: Output Voltage

### 5.2.2 Power-on Initialization

Firstly the system initializes during the controller power-on, and LED displays "b-603". After the initialization is completed, the controller is on stand-by status.

### 5.2.3 Parameter Setting

Three levels of menu are: 1. Function code group (first-level); 2. Function code (second-level); 3. Function code setting value (third-level)

- ▲ At the primary interface, press <</SHIFT or >>/SHIFT will switch over display running/stop status monitoring parameters;
- ▲ At the primary interface, press PRG/ESC will enter the first-level menu then press PRG/ESC will return to the primary interface;

- ▲ At the first-level menu, press DATA/ENT will enter the second-level menu. In second-level menu can also press PRG/ESC and DATA/ENT return to first-level menu or enter third-level menu;
- ▲ At third-level menu, press both PRG/ESC and DATA/ENT can return to the second-level menu, difference is: pressing DATA/ENT will save the parameters into the controller and return to the second-level menu with shifting to the next function code automatically; while pressing PRG/ESC will directly return to the second-level menu without saving the parameters, and keep staying at the current function code.

Example 1: Change factory pressure setting 3.0 bar to 2.5 bar

Method 1: Enter parameter setting

Operation flow chart:

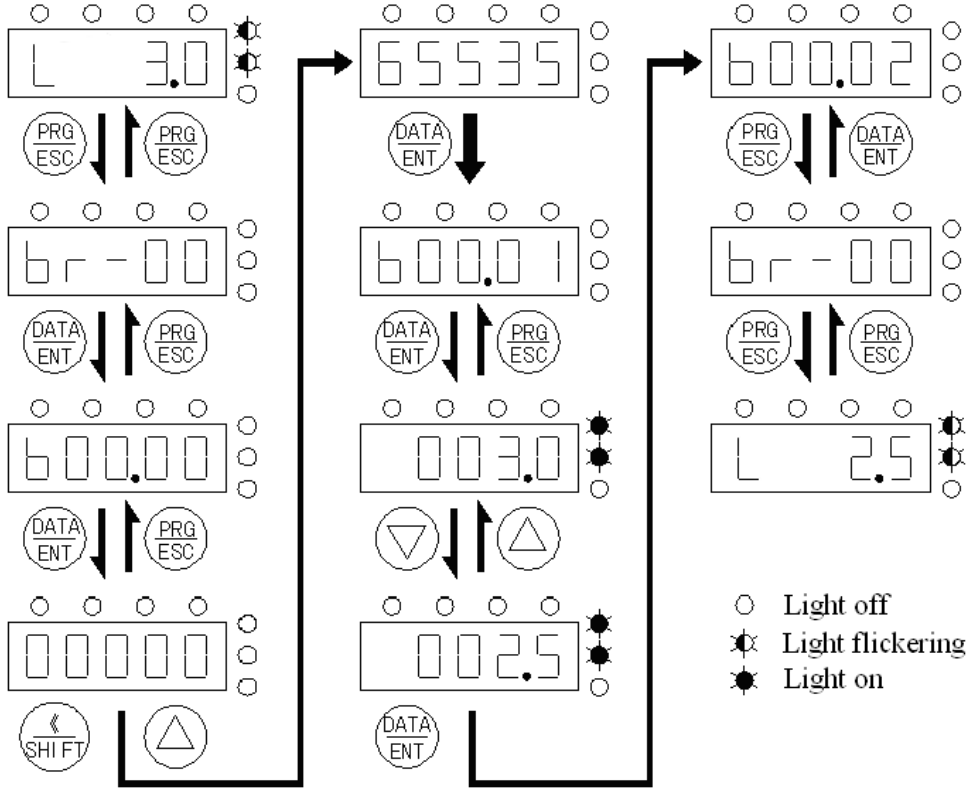



Figure 5.2.1 Operation flow chart

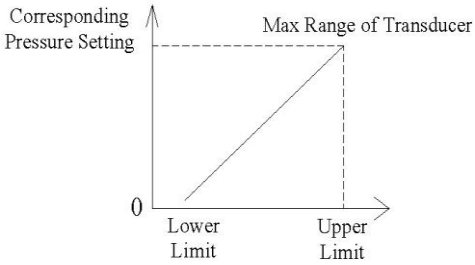
Method 2: Direct setting at the primary interface

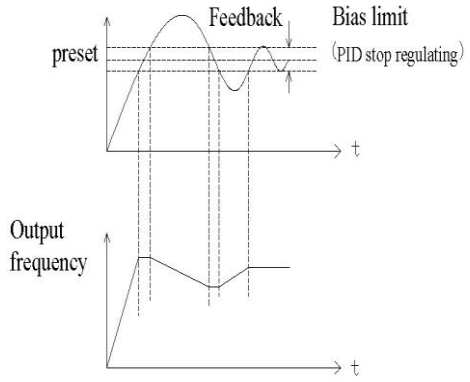
Press △ or ▽ at primary interface, the system will switch-over to display setting pressure, press △ or ▽ again, the setting pressure increase/decrease, mean while the system trace the setting pressure. After complete the pressure setting , please press DATA/ENT to save the value.

Example 2: During the running of controller, press <</SHIFT or >>/SHIFT to scroll through the parameters in left or right order until there are two upper lights on, can check the feedback pressure value.

# 6. INSTRUCTIONS OF PARAMETERS GROUP

| Function Code | Name | Setting Range | Factory Setting | Description |
|---|---|---|---|---|
| **Br00 Group Application Function** | | | | |
| b00.00 | Debugging Password | 0~65535 | 65535 | Decide by b06.09, default is 65535 |
| b00.01 | Pressure Setting Value | 0.0~100.0bar | 3.0bar | Set according to the actual requirements of user |
| b00.02 | Motor Rotating Direction | 0~1 | 0 | 0: Forward 1: Reverse |
| b00.03 | Freeze-proofing | 0~1 | 0 | Used in cold areas<br>0: Invalid 1: Valid |
| b00.04 | Anti-clogging | 0~1 | 0 | Prevention measures<br>0: Invalid 1: Valid |
| b00.05 | Anti-clogging Rotating Cycle | 1.0~300.0s | 20.0s | Set the forward/reverse rotating direction cycle and corresponding output frequency (should not be higher than the rated frequency of the pump) of anti-clogging. |
| b00.06 | Anti-clogging Output Frequency | 0.00~600.00 Hz | 15.00Hz | |
| **Br01 Group Application Function** | | | | |
| b01.00 | High Water Pressure/Level Alarm Value | 0.0~100.0bar | 8.0bar | When pressure is higher than this preset value, the controller halts, alarms and displays HP. |
| b01.01 | Low Water Pressure/Level Alarm Value | 0.0~100.0 bar | 0.5bar | When pressure is lower than the preset value for a low pressure running time, the controller halts， alarms and displays LP |
| b01.02 | Low Pressure/Level Running Time | 0~300s | 20s | |
| b01.03 | Minimum Freeze-proofing Frequency | 1.00~30.00Hz | 5.00Hz | Be valid when b00.03 was set to 1, whenever sleeps, running with the setting frequency in case of freezing. |
| b01.04 | Anti-clogging FWD./REV. Dead Time | 0.0~3600.0s | 1.0s | When anti-clogging is valid, b01.04 set the FWD./REV. transition time |
| b01.05 | Maximum Transducer Setting Range | 0.0~100.0bar | 10.0bar | E.g. If the rated max. range of transducer is 10bar, b01.05 should be set to 10.0 |
| b01.06 | AI1 Lower Limit | 0.00~10.00V | 1.00V | •**Lower limit use to transducer zero setting**<br>•Higher limit use to accordant display and transducer pressure.<br>•**When display smaller than gauge, increase higher limit**; **When display** |
| b01.07 | Corresponding Setting of AI1 Lower Limit | -100.0~100.0% | 0.0% | |
| b01.08 | AI1 Higher | 0.00~10.00V | 5.00V | |

| Function Code | Name | Setting Range | Factory Setting | Description |
|---|---|---|---|---|
| | Limit | | | **greater than gauge, decrease higher limit.** •When analog input is interfered, prolong filtering time so as to increase the ability of anti-interference, but decrease the sensitivity. •Corresponding relationship of transducer parameter setting:   Figure6.1.1 Transducer parameters |
| b01.09 | Corresponding Setting of AI1 Higher Limit | -100.0~100.0% | 100.0% | |
| b01.10 | AI1 Filtering Time | 0.00~10.00s | 0.10s | |
| b01.11 | AI2 Lower Limit | 0.00~10.00V | 1.00V | |
| b01.12 | Corresponding Setting of AI2 Lower Limit | -100.0~100.0% | 0.0% | |
| b01.13 | AI2 Higher Limit | 0.00~10.00V | 5.00V | |
| b01.14 | Corresponding Setting of AI2 Higher Limit | -100.0~100.0% | 100.0% | |
| b01.15 | AI2 Filtering Time | 0.00~10.00s | 0.10s | |
| b01.16 | Restart After Power-on | 0~1 | 0 | 0: invalid 1: valid |
| b01.17 | Control Mode | 0~1 | 1 | 0: Synchronous 1: Master-slave |
| **Br02 Group Application Function** | | | | |
| b02.00 | PID Source Selection | 0~1 | 0 | 0: Keypad 1: Reserved |
| b02.01 | PID Feedback Source Selection | 0~1 | 0 | 0: AI1 1: Reserved |
| b02.02 | PID Output Characteristics | 0~1 | 0 | 0: Water supply 1: Pumping |
| b02.03 | Proportional Gain (KP) | 0.00~100.00 | 2.50 | Determining the strength of PID regulation, KP is bigger, regulation is stronger, but fluctuate easier too. |
| b02.04 | Integral Coefficient (KI) | 0.00~10.00 | 1.00 | Bias between the feedback and the given, determining the speed of regulation, KI is bigger, regulation is stronger. |
| b02.05 | Derivative Coefficient (KD) | 0.00~10.00 | 0.00 | Variable ratio between the feedback and the given, KD is bigger, regulation is stronger. Be cautious use, for differential regulation amplifies interference of system. |
| b02.06 | Sampling Cycle (T) | 0.01~100.00s | 0.10s | Calculating time of regulator, when increased, response sluggishly. |
| b02.07 | PID Control Bias Limit | 0.0~100.0% | 0.0% | Max. bias of PID output value corresponding to closed loop given value: |

| Function Code | Name | Setting Range | Factory Setting | Description |
|---|---|---|---|---|
| | | | | <br>Figure6.2.1 PID control curve<br>Corresponding System Diagram of Max. Limit and Output Frequency.<br>Properly set the value can regulate the accuracy and stability of PID system. |
| b02.08 | AI1 Feedback Lost Detecting Value | 0.0~100.0% | 1.0% | Transducer fault detecting setting value, corresponding to full range (100%), when the detecting time exceeds feedback lost time, it is deemed as malfunction by transducer, the system will report E022 as transducer fault code. |
| b02.09 | AI2 Feedback Lost Detecting Value | 0.0~100.0% | 0.0% | |
| b02.10 | Feedback Lost Detecting time | 0.0~3600.0s | 1.0s | |
| **Br03 Group Application Function** | | | | |
| b03.00 | Communication Address | 0~31 | 02 | 00: Master controller<br>01~05: Auxiliary controller<br>06~31: Reserved |
| b03.01 | Baud Rate Selection | 0~5 | 3 | Data of master and slave comes into the rate.<br>0: 1200BPS 1: 2400BPS<br>2: 4800BPS 3: 9600BPS<br>4: 19200BPS 5: 38400BPS |
| b03.02 | Data Format | 0~5 | 0 | Data format (parity check) |
| b03.03 | Communication Delay Time | 0~200ms | 15ms | Interval of data responding. |
| b03.04 | Communication Timeout Delay 0.0: invalid | 0.0~100.0s | 0.0s | If the interval time exceeds the setting value, the system will report E018 as fault. |
| b03.05 | Communication Error Action | 0~1 | 0 | 0: Halt and alarm<br>1: Don’t alarm and continue |
| b03.06 | Communication Response Action | 0~1 | 0 | 0: Responding to write operation<br>1: Un-responding to writer operation |

| Function Code | Name | Setting Range | Factory Setting | Description |
|---|---|---|---|---|
| b03.07 | Data Transmission Time Interval | 0.05~2.00s | 0.10s | Ensure the effects of data transmission, long-time setting will slow down data transmission and short-time setting will easily make mistakes. |
| b03.08 | Slave Quantity | 0~5 | 0 | 0: None |
| b03.09 | Fault Shift | 0~2 | 2 | Fault Master Shift<br>●Invalid: Factory setting: 2<br>●Valid: Master set as 0;<br>Salve 1 set as 1.<br>Remarks: Fault shift demands the salve 1 to connect a backup transducer. |
| **Br04 Group Application Function** | | | | |
| b04.00 | Sleeping Function | 0~1 | 1 | No consuming auto stop.<br>0: Invalid 1: Valid |
| b04.01 | Sleeping Waiting Time | 0.0~300.0s | 5.0s | Delay time, seconds unit |
| b04.02 | Sleeping Test | 0.0~10.0% | 4.0% | Water consuming test frequency rate. |
| b04.03 | Wake-up Pressure Bias | 0.0~20.0bar | 0.5bar | During sleeping the wake-up pressure bias, e.g. the setting value (L)=3.0bar, bias (b04.03)=0.5bar, practical pressure (P)<L-0.5=2.5bar, the pump will restart again. |
| b04.04 | Sleeping Bias | 0.0~1.0bar | 0.0bar | The pressure fluctuation which allows sleeping |
| **Br05 Group Application Function** | | | | |
| b05.00 | Water Level Control | 0~2 | 2 | Water level switch style,<br>0: invalid 1: NC 2: NO |
| b05.01 | Low Lever Restart Delay Time | 0~300min | 1min | Delay time of restart after water level switch recover. |
| b05.02 | Terminal S1S2 Control | 0~3 | 2 | 0: Invalid<br>1: Electric contact control<br>S1-COM on: Frequency rise<br>S2-COM on: Frequency drop<br>2: Manual/auto control<br>S2-COM off: Auto control<br>S2-COM on: Manual control<br>3: Terminal run/stop<br>S1-COM on: Run<br>S1-COM off: Stop<br>S2-COM off: Auto control<br>S2-COM on: Manual control |
| b05.03 | Acceleration | 0.1~3600.0s | Model | The setting time from zero to max. |

| Function Code | Name | Setting Range | Factory Setting | Description |
|---|---|---|---|---|
| | Time | | Set | frequency |
| b05.04 | Deceleration Time | 0.1~3600.0s | Model Set | The setting time from max. frequency to zero |
| b05.05 | Maximum Output Frequency | 10.00~600.00 Hz | 50.00Hz | Determine the Acc./Dec. rate |
| b05.06 | Up limit of Output Frequency | b05.07~b05.05 (Maximum Frequency) | 50.00Hz | Maximum running frequency |
| b05.07 | Lower Limit of Output Frequency | 0.00Hz~b05.07 | 20.00Hz | The minimum running frequency of pump. |
| b05.08 | Carrier Frequency | 1.0~15.0kHz | Model Set | Use to ameliorate the noise of motor and controller's interference to the surroundings. A high carrier makes a low motor noise, but leads to a big temperature rise and interference.Should not be altered if unnecessary. |
| b05.09 | Low Pressure (LP) Restart Delay Time | 00~60min | 10min | In case of low pressure, b05.09≠0, the controller restarts to work according to the setting time automatically, without artificial restart. b05.09=0, restart invalid. |
| b05.10 | Alternating Time | 0.00~300.00h | 8.00h | In order to balance and prolong the pump service life to set the parameter, unit: hour. When the parameter is set to 0.0, it means in-execution. Operational time of master and auxiliary pump switches over according to the setting alternating time. |
| **Br06 Group Application Function** | | | | |
| b06.00 | Running Status Display Selection | 0~0x1FF | 0x01F | bit0: Operational frequency<br>bit1: The actual pressure of pump outlet<br>bit2: The setting pressure of pump outlet<br>bit3: Output current<br>bit4: DC bus voltage<br>bit5: Output voltage<br>bit6: Present time<br>bit7: The actual pressure of pump inlet<br>bit8: Input terminal status |
| b06.01 | Stop Status Display Selection | 0~0x1FF | 0x00F | bit0: The setting pressure of pump outlet<br>bit1: The actual pressure of pump outlet<br>bit2: Giver frequency<br>bit3: DC bus voltage<br>bit4: Input terminal status |

| Function Code | Name | Setting Range | Factory Setting | Description |
|---|---|---|---|---|
| | | | | bit5:Output terminal status<br>bit6: AI1 input voltage<br>bit7: The actual pressure of pump inlet<br>bit8: Present time |
| b06.02 | Keypad Display Selection | 0~3 | 3 | 0: External keypad prior enable<br>1: Both display enable, only external keypad control;<br>2: Both display enable, only on board keypad control;<br>3: Both display enable and keypad control |
| b06.03 | Relay Output Selection | 0~5 | 0 | 0: Error or external fault<br>1: Forward running<br>2: Frequency reaching<br>3: Stop status<br>4: Lower limit of output frequency reaching<br>5: The frequency is not equal to zero |
| b06.04 | Third Latest Fault Type | | Read Only | E000~E022<br>Refers to chapter 9. |
| b06.05 | Second Latest Fault Type | | | |
| b06.06 | Latest Fault Type | | | |
| b06.07 | Parameters Storage Condition | 0~2 | 0 | 0: Power-off storage<br>1: Power-off default storage<br>2: Invalid |
| b06.08 | Accumulated Running Time | 0~65535h | Read Only | Display accumulated running time |
| b06.09 | Set the Password of b00.00 | 0~65535 | 65535 | Password set prevent user from modifying the parameters randomly, avoiding running abnormally and damages. |
| **Br07 Group Application Function** | | | | |
| b07.00 | Day-part Function Selection | 0~3 | 0 | 0: Invalid<br>1: Day-part A<br>2: Day-part A and B<br>3: Day-part A, B, C |
| b07.01 | Day-part A Starting Time | 00:00~24:00 | 00-00 | ●Setting starting time and finishing time to 0 is invalid.<br>●Pressure setting determines the steady state value of outlet pressure.<br>●Once actual pressure from inlet pipe network lower than inlet pressure lower limit, the pump stops. |
| b07.02 | Day-part A Pressure Setting | 0.0~20.0bar | 3.0bar | |
| b07.03 | Day-part A Finishing Time | 00:00~24:00 | 00-00 | |
| b07.04 | AI2 Lower | 0.0~20bar | 2.0bar | |

| Function Code | Name | Setting Range | Factory Setting | Description |
|---|---|---|---|---|
| | Limit of Day-part A | | | ●When regardless of the inlet water pressure, just set the lower limit as 0. |
| b07.05 | Day-part B Starting Time | 00:00~24:00 | 00-00 | |
| b07.06 | Day-part B Pressure Setting | 0.0~20bar | 3.0bar | |
| b07.07 | Day-part B Finishing Time | 00:00~24:00 | 00-00 | |
| b07.08 | AI2 Lower Limit of Day-part B | 0.0~20.0bar | 3.0bar | |
| b07.09 | Day-part C Starting Time | 00:00~24:00 | 00-00 | |
| b07.10 | Day-part C Pressure Setting | 0.0~20.0bar | 3.0bar | |
| b07.11 | Day-part C Finishing Time | 00:00~24:00 | 00-00 | |
| b07.12 | AI2 Lower Limit of Day-part C | 0.0~20.0bar | 2.0bar | |
| b07.13 | Lower Limit of Inlet Pressure | 0.0~100.0bar | 0.0bar | Valid all day, especially for the use of taking account of inlet water pressure. When not needed,, set as 0. |
| b07.14 | Restore Defaults | 0~2 | 0 | 0: No action<br>1: Set to default<br>2: Clear error records |
| b07.15 | Password of Group Br08 | 0~65535 | 65535 | |
| **Br08 Group Application Function** | | | | |
| b08.00 | G/P Option | 0~1 | 1 | 0: G model 1: P model |
| b08.01 | Motor Rated Power | 0.4~350kW | Model Set | Depend on model, setting parameters according to nameplate of motor |
| b08.02 | Motor Rated Frequency | 0.00~600.00Hz | 50.00Hz | |
| b08.03 | Motor Rated Speed | 0~36000RPM | Model Set | |
| b08.04 | Motor Rated Voltage | 0~460V | | |
| b08.05 | Motor Rated Current | 0.0~2000.0A | | |
| b08.06 | Reserved | 0~65535 | 00000 | |
| b08.07 | Set the Password of | 0~65535 | 65535 | Modify password of b07.15 |

| Function Code | Name | Setting Range | Factory Setting | Description |
|---|---|---|---|---|
| | b07.15 | | | |
| b08.08 | Password of Factory Parameters | 0~65535 | xxxxx | Don't try to enter or will cause abnormal operation and damages. |

In order to ensure the pumps running safety, please enter rated value correctly from motor nameplate.

# 7. APPLICATION GUIDANCE

B603 product has various function, the following introduce some typical application cases of B603 and relevant parameter setting methods. In practical applications, you can reference to set.

## 7.1 Single Pump Water Supply and Parameter Setting

### 7.1.1 System Wiring

In diagram: ①B603D intelligent controller; ②Pumps group; ③Pressure tank; ④None-return valve; ⑤Pressure transducer; ⑥Water level switch (to pool); ⑦Fault indicator; ⑧Power supply indicator; ⑨ Fuse; ⑩ Breaker. Only wants the faults and running indication will requires ⑦⑧⑨.

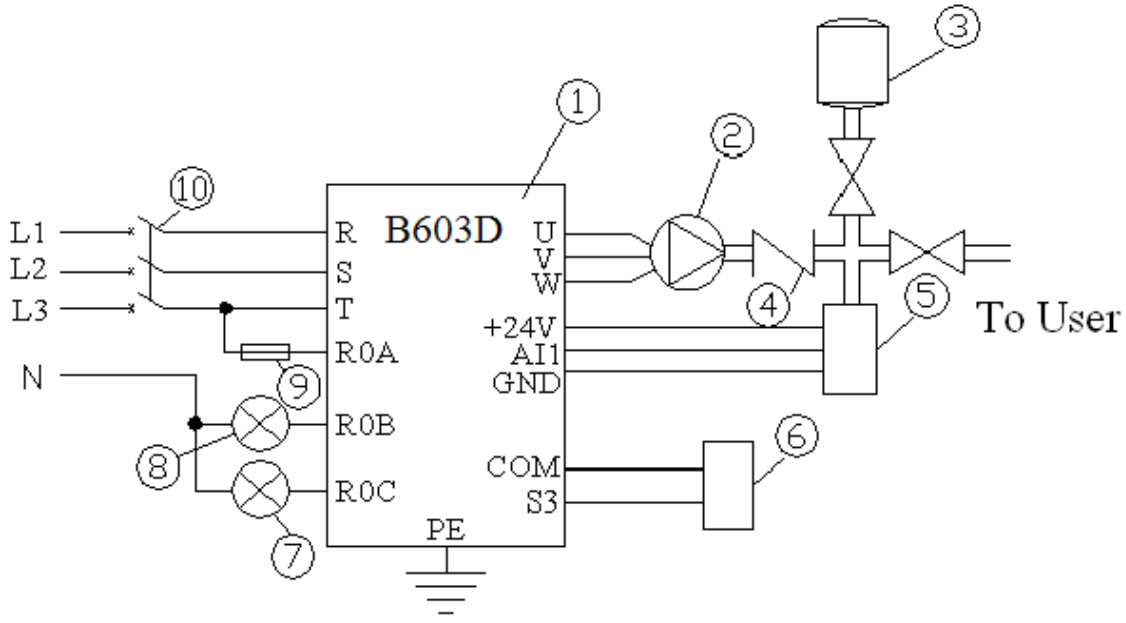



Figure7.1.1 Single pump wiring addition failure indication

1) In the figure, we adopted the transducer is two line current type transducer of the company. Others connect refers to Figure4.3.1;

2) The pool water should be used water level control switch. If the water pump is the pipeline booster pressure pump, it does not need the water level control switch.

### 7.1.2 System Debugging Procedure

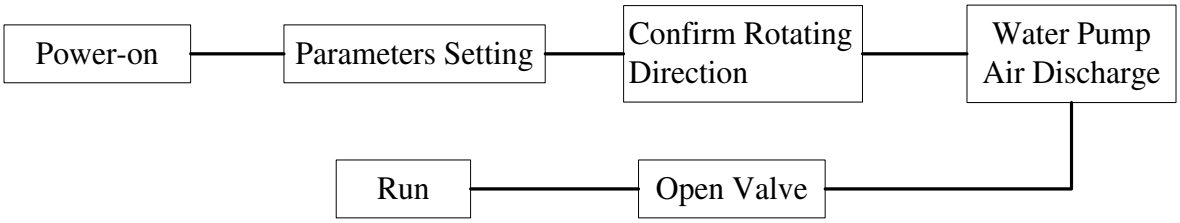



Figure7.1.2 Debugging flow diagram

### 7.1.3 Relevant Parameter Setting

Table 7.1.1 Parameter setting of single pump constant pressure control water supply

| Code | Factory Setting | Recommend | Description |
|---|---|---|---|
| b00.00 | 65535 | 65535 | Password of entering parameter groups. Factory set is 65535, it can be modified by b06.09. |
| b08.01~ b08.05 | | | Ensure normal operation, must input parameter according to nameplate of motor. |
| b00.02 | 0 | x | Motor rotating direction, set according to the actual motor wiring of spot. Make sure the motor is running in forward direction. |
| b01.08 | | | When display smaller than gauge, decrease b01.08;<br>When display greater than gauge, increase b01.08. |
| Below need to set based on working conditioning and user's requirement. | | | |
| b00.01 | 3.0 | x.x | The pressure of water supply |
| b01.00 | 8.0 | xx.x | High Water Pressure Alarm Value, Prevent system from damage caused by high water pressure. |
| b01.01 | 0.5 | x.x | Low Water Pressure Alarm Value, prevent pump from damage caused by anhydrous idling. |
| b01.05 | 10.0 | xx.x | Transducer range, input the max. range of connected transducer |
| b01.16 | 1 | x | Restart after Power-on, Considering unattended management, set parameter to 1. |
| b05.00 | 0 | x | Water Level Switch type, according to the using switch type<br>1: NC valid 2: NO valid |
| **b05.02** | **2** | **3** | ***Notice: Only set this parameter on apply the terminal control , simply set the master** |
| **b00.03** | **0** | **1** | *** Anti-freezing function, valid it when the pump work under a freezing temperature.** |
| b02.03 | | | PID parameter debugging. Increase voltage stabilization accuracy or proper regulation when Bias oversize and overwhelmed. |
| b02.04 | | | |
| br07 group | | | Day-part water supply, set when needs the function. Reserved as additive pipe water supply mode, offering Day-part variable pressure water supply and prevent insufficient net work pressure from affecting Public Water Supply. Its' setting refer to section 7.3. |

## 7.2 Multi-pump Control

### 7.2.1 Typical System Wiring

In diagram: UF—B603D controller; QA—Automatic air switch; QF—Break; FU—Fuse; HB—Power light; HC—Fault light; MP—Motor and pump; BQ—Water level switch; BP1—Outlet transducer; BP2—Backup transducer. Only wants the faults and running indication will requires the HB, HC, FU.

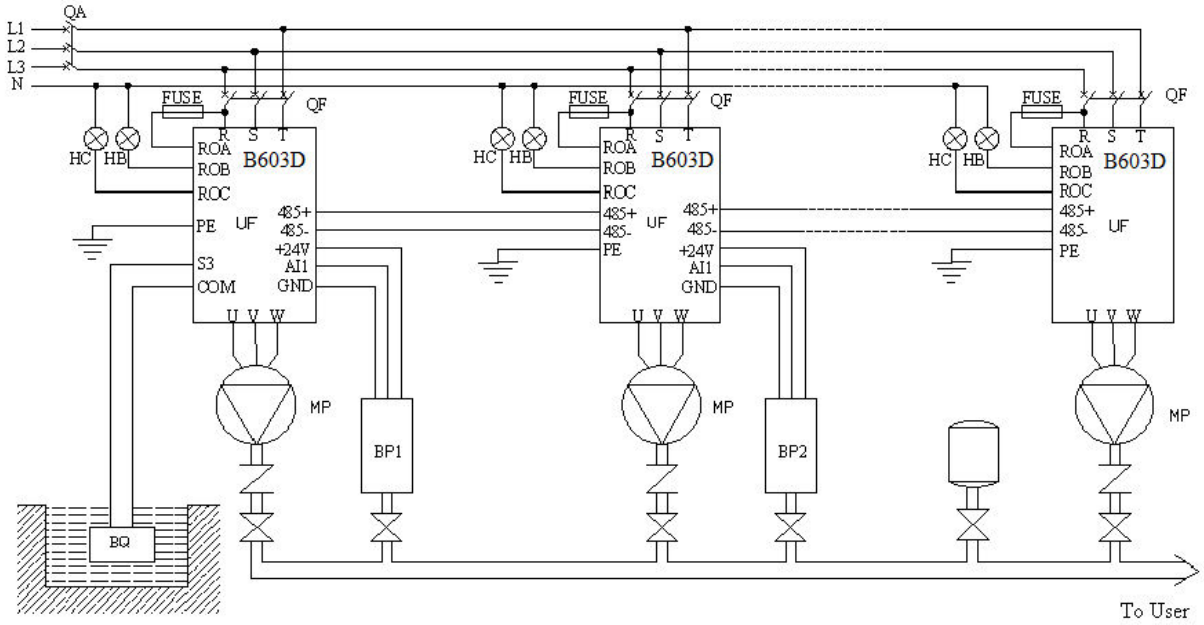



Figure7.2.1 Multi-pump control wiring

### 7.2.2 Relevant Parameter Setting

Table 7.2.1 Multi-pump control master setting

| Code | Factory Setting | Recommend | Description |
|---|---|---|---|
| b00.00 | 65535 | 65535 | Password of entering parameter groups. Factory set is 65535, it can be modified by b06.09. |
| b08.01~ b08.05 | | | Ensure normal operation, must input parameter according to nameplate of motor. |
| b00.02 | 0 | x | Motor rotating direction, set according to the actual motor wiring of spot. Make sure the motor is running in forward direction. |
| b03.00 | 02 | 00 | Communication address, the master should be 00. |
| b03.08 | 00 | N | Slave number, assume 1 master N slaves, set as N. |
| b01.08 | | | When display smaller than gauge, decrease b01.08;<br>When display greater than gauge, increase b01.08. |
| Below need to set based on working conditioning and user's requirement. | | | |
| b00.01 | 3.0 | x.x | The pressure of water supply |
| b01.00 | 8.0 | xx.x | High Water Pressure Alarm Value, Prevent system from damage caused by high water pressure. |
| b01.01 | 0.5 | x.x | Low Water Pressure Alarm Value, prevent pump from damage caused by anhydrous idling. |

| Code | Factory Setting | Recommend | Description |
|---|---|---|---|
| b01.05 | 10.0 | xx.x | Transducer range, input the max. range of connected transducer |
| b01.16 | 1 | x | Restart after Power-on, Considering unattended management, set parameter to 1. |
| b01.17 | 1 | x | Running mode select, 0 is synchronous control mode, 1 is master-slave control mode. |
| b05.00 | 0 | x | Water Level Switch type, according to the using switch type<br>1: NC valid 2: NO valid |
| b05.10 | 8.00 | xx.x | Alternating time, balance the service time of all pumps. |
| **b00.03** | **0** | **1** | *** Anti-freezing function, valid it when the pump work under a freezing temperature.** |
| br07 group | | | Day-part water supply, set when needs the function. Reserved as additive pipe water supply mode, offering Day-part variable pressure water supply and prevent insufficient net work pressure from affecting Public Water Supply. Its' setting refer to section 7.3. |
| **b00.03** | **0** | **1** | Anti-freezing function, valid it when the pump work under a freezing temperature. |
| **b03.09** | **2** | **0** | Set this parameter when enable fault shift function. |

Table 7.2.2 Multi-pump control slaves' setting

| Code | Factory Setting | Recommend | Description |
|---|---|---|---|
| b00.00 | 65535 | 65535 | Password of entering parameter groups. Factory set is 65535, it can be modified by b06.09. |
| b02.08 | 1.0 | 0.0 | Auxiliary is need not to connect a transducer, this parameter should be set as 0. If you use the Fault Shift, this parameter of the backup master no need to modify. |
| b08.01~ b08.05 | | | Ensure normal operation, must input parameter according to nameplate of motor. |
| b00.02 | 0 | x | Motor rotating direction, set according to the actual motor wiring of spot. Make sure the motor is running in forward direction. |
| b03.00 | 02 | 01~0N | Communication address, the auxiliaries should be set as 01 to 0N in order. |
| b03.08 | 00 | N | Slave number, assume 1 master N slaves, set as N. |
| b03.09 | 2 | 1 | Only Set the Auxiliary which address parameter b03.00 is equal to "01"when enable the Fault Shift, others no need to modify. |

## 7.3 Day-Part Water Supply Application Setting

### 7.3.1 System Wiring

In diagram: ①B603Dcontroller; ②Pumps; ③Air pressure tank; ④Water inlet transducer; ⑤Water outlet transducer; ⑥Water level switch (Use in no negative pressure water supply)

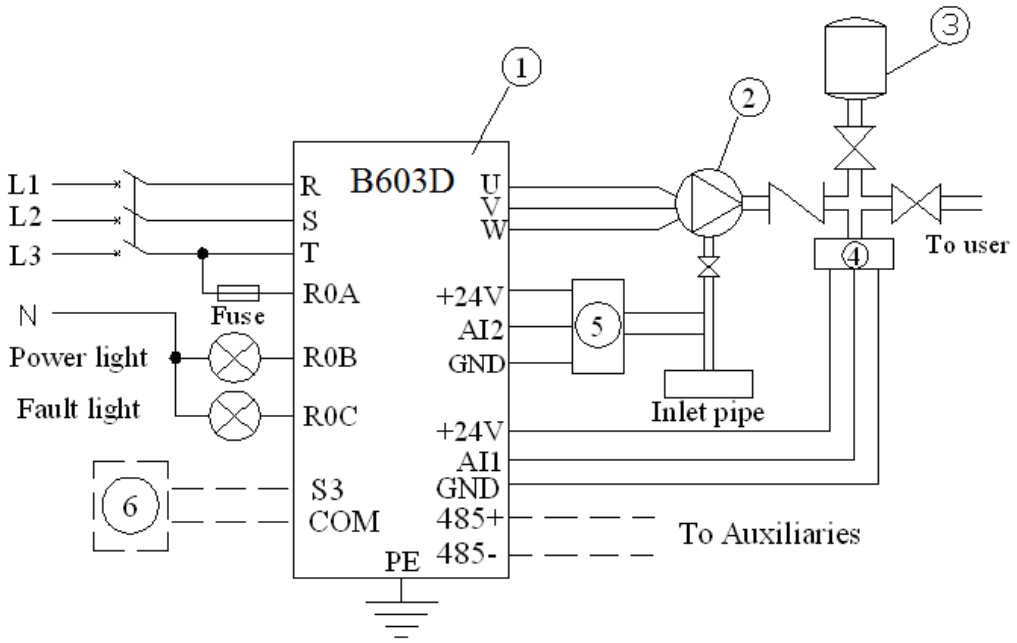



Figure7.3.1 Day-part water supply wiring

### 7.3.2 Typical Application

Use in pipe pressure lamination, no negative pressure water supply, pipe network add-pressure to up level tank water supply, etc..

For example:

First part running 2.5bar from 00:00 to 06:00, stop running as water inlet pressure below 2.0bar;

Second part running 3.2bar from 06:00 to 13:30, stop running when inlet pressure below 2.3bar;

Third part running 3.5bar from 17:00 to 23:00, stop running when inlet pressure below 2.2bar;

The undefined day part running 3.0bar, stop running when inlet pressure below 1.8bar.

### 7.3.3 Relevant Parameter Setting

Follow section 7.1 or section 7.2 to set other parameters first, and then refer to this application to set day-part control parameters.

Table 7.3.1 Day-part water supply parameter setting

| Code | Factory Setting | Recommend | Description |
|---|---|---|---|
| b01.11 | | | Inlet transducer calibration (b01.11,b01.13), if needn't detect inlet pressure, no need to install inlet transducer and calibration, but the inlet pressure lower limit of every day-part set as 0 is needed. |
| b01.13 | | | |
| b07.00 | 0 | 3 | Day-part number setting, 0 means day-part control invalid, we now choose 3 day-part. |
| b07.01 | 00-00 | 00-00 | Set 00:00~06:00 running with 2.5bar, stop when inlet pressure |

| Code | Factory Setting | Recommend | Description |
|---|---|---|---|
| b07.02 | 3.0 | 2.5 | below 2.0bar. (It recovers running when inlet pressure return to 2.0bar again) |
| b07.03 | 00-00 | 06-00 | |
| b07.04 | 2.0 | 2.0 | |
| b07.05 | 00-00 | 06-00 | Set 06:00~13:30 running with 3.2bar, stop when inlet pressure below 2.3bar. |
| b07.06 | 3.0 | 3.2 | |
| b07.07 | 00-00 | 13-30 | |
| b07.08 | 2.0 | 2.3 | |
| b07.09 | 00-00 | 17-00 | Set 17:00~23:00 running with 3.5bar, stop when inlet pressure below 2.2bar. |
| b07.10 | 3.0 | 3.5 | |
| b07.11 | 00-00 | 23-00 | |
| b07.12 | 2.0 | 2.2 | |
| b07.13 | 0.0 | 1.8 | Set running with 3.0bar at the undefined time, stop when inlet pressure below 1.8bar. |
| b00.01 | 3.0 | 3.0 | |

## 7.4 Terminal Run/Stop Control Wiring and Setting

### 7.4.1 System Wiring

Base on above applications, connect a switch to S1-COM refers to section 4.3.

In diagram: ①B603D intelligent controller; ②Pumps; ③Air pressure tank; ④water outlet transducer; ⑤Water inlet Transducer; ⑥Water level switch; ⑦External run/stop switch.

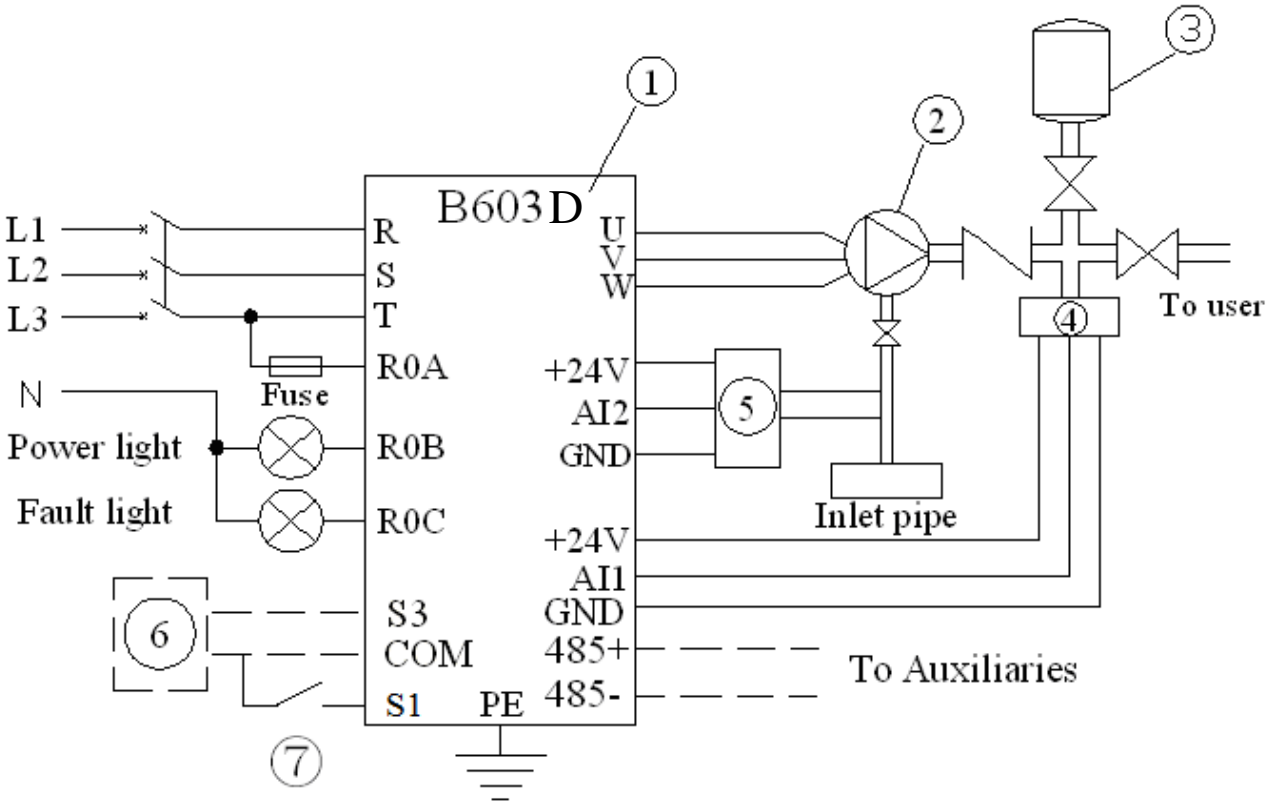



Figure7.4.1 Terminal run/stop wiring

### 7.4.2 Operation

Widely use in the occasion of remote run/stop, it's recommended to use a shield twisted pair to wire the external switch. When the external switch of S1-COM turn on, pumps running, when it turn off, pumps stop.

### 7.4.3 Relevant Parameter Setting

According to the application and section 7.1 or section 7.2 to set other parameters first, and then set master b05.02=3. Auxiliaries should press run to put it on standby after set it's parameters.

## 7.5 Manual/Auto Control Wiring and Setting

### 7.5.1 System Wiring

Base on above applications, connect a switch to S2-COM refers to Figure4.3.1. Normally apply this function on auxiliaries.

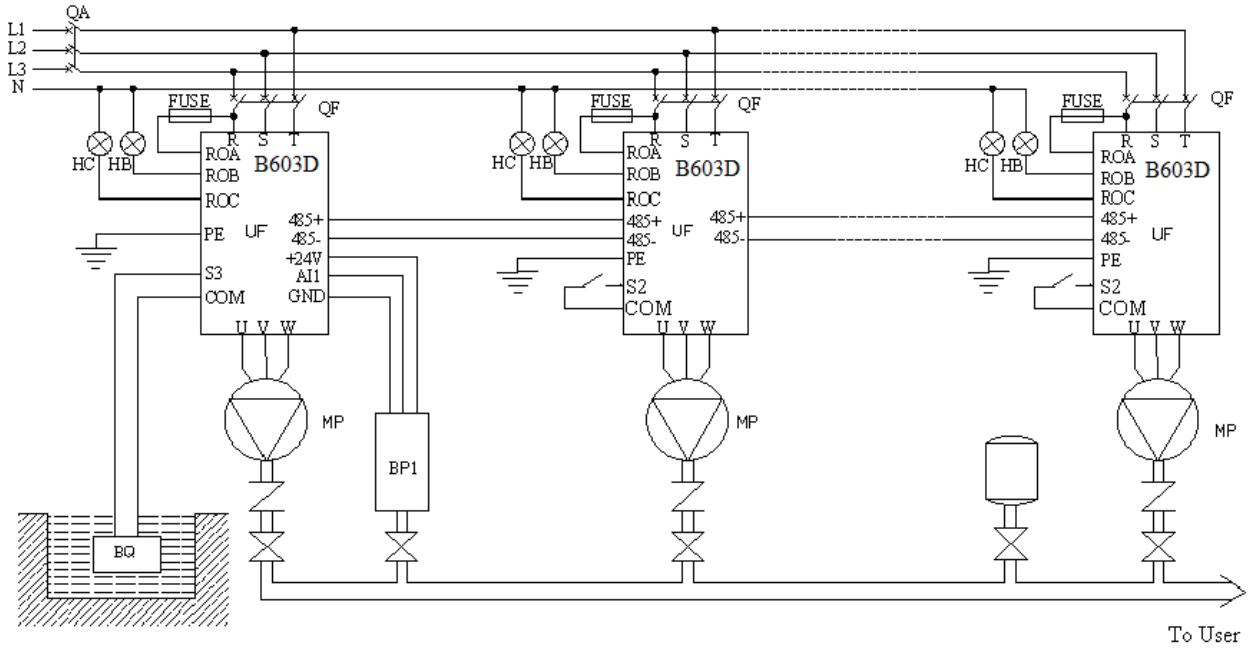



Figure7.5.1 Manual/Auto control wiring

### 7.5.2 Operation

Widely use in building site manual control water supply, new pipe system quick fill etc. needs full-frequency running place. When finish the parameter set, switch on S2-COM, the switch pump running with full-frequency.

### 7.5.3 Relevant Parameter Setting

According to the application and section 7.1 or section 7.2 to set other parameters first, and then set auxiliaries b05.02=2.

## 7.6 Electric Contact Gauge Water Supply

### 7.6.1 System Wiring

In diagram: ①B603D intelligent controller; ②Pumps; ③Air pressure tank; ④Pressure switch; ⑤ Water level switch

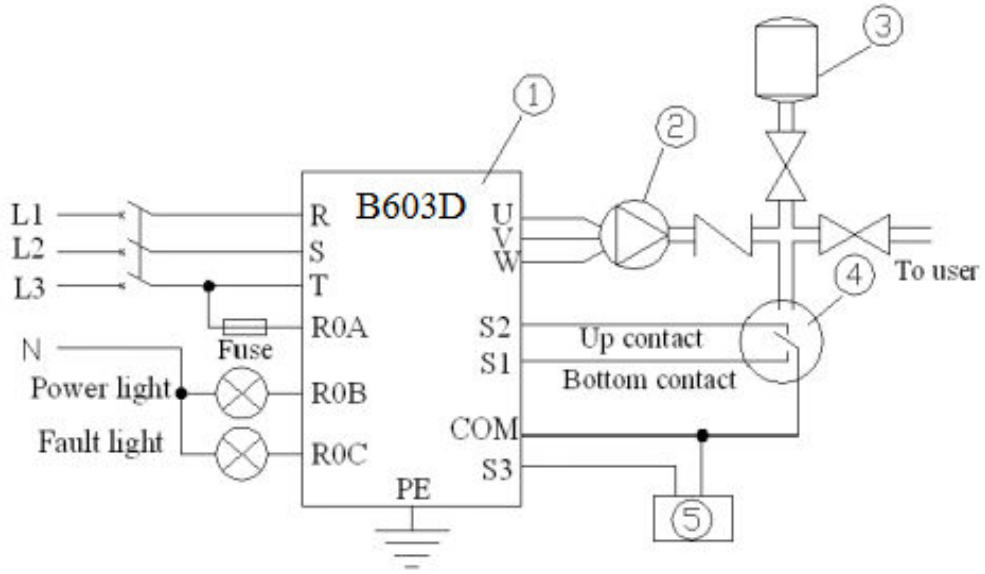



Figure7.6.1 Electric contact pressure gauge control wiring diagram

## 7.6.2 Relevant Parameter Setting

This example use the electric contact pressure gauge instead of the transducer (Wiring refer to figure 4.3.1), adjust the gauge's up electric contact and bottom electric contact to the range of need is should be done before running. For example, want a 0.3MPa water supply, then up contact adjust above scale 0.3MPa (such as at 0.32MPa), bottom electric contact below 0.3MPa (such as at 0.28MPa).

## 7.6.3 Relevant Parameter Setting

Table 7.6.1 Electric contact pressure gauge control setting

| Code | Factory Setting | Recommend | Description |
|---|---|---|---|
| b00.00 | 65535 | 65535 | Password of entering parameter groups. Factory set is 65535, it can be modified by b06.09. |
| b02.08 | 1.0% | 0.0% | AI1 feedback lost detecting value, this application need not pressure detect, set the parameter 0. |
| b08.01~ b08.05 | | | Ensure normal operation, must input parameter according to nameplate of Motor. |
| b00.02 | 0 | x | Motor rotating direction, set according to the actual motor wiring of spot. Make sure the motor is running in forward direction. |
| b01.02 | 20 | xx | Low pressure running time, should be increase at the occasion of water pressure rise slowly. The LP running time stand for the maximum switch on duration time of the bottom electric contact. When it run for three time of b01.02, the bottom contact (namely S1-COM) still switch on, the controller break down and display LP. |
| b05.02 | 2 | 1 | Terminal S1S2 control, set as electric contact pressure gauge control. |

| Code | Factory Setting | Recommend | Description |
|---|---|---|---|
| Below need to set based on working conditioning and user's requirement. | | | |
| b01.16 | 0 | x | Restart after power-on, considering unattended management, set parameter to 1. |
| b05.00 | 2 | x | Water level (terminal S3) switch type, according to the using switch type<br>1: NC valid 2: NO valid |
| b05.01 | 001 | xxx | S3 action delay time, In case slow incoming water leads to frequent initiate-stop. |
| b05.03 | | | Acc. and Dec. time. It is recommended to set equal or above 20s, a short acc./dec. time lead to a fluctuate control. |
| b05.04 | | | |

## 7.7 Pumping Application

### 7.7.1 System Wiring

In diagram: ①B603D controller; ② Pumps; ③Water level transmitter

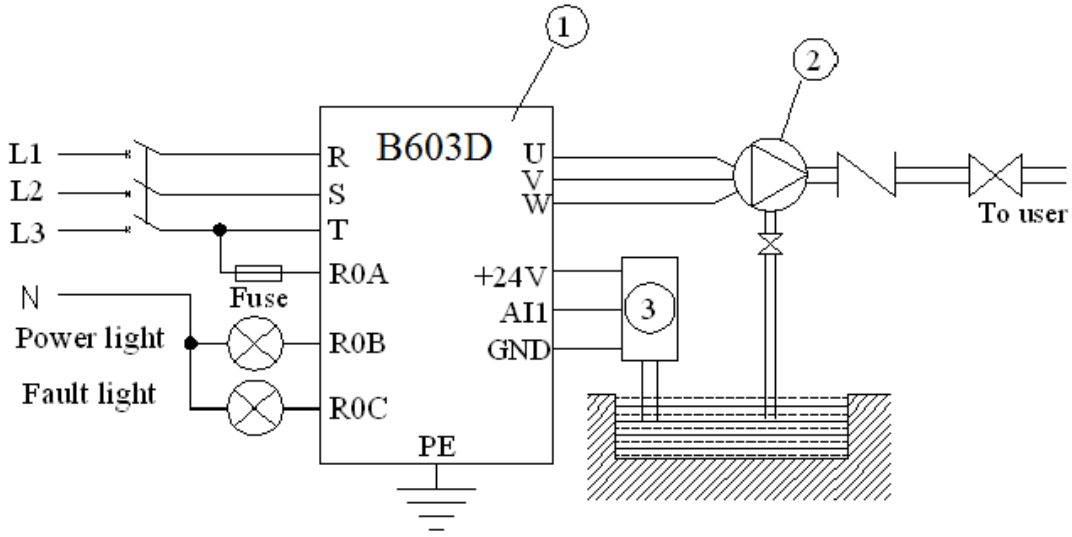



Figure7.7.1 Pumping control wiring

### 7.7.2 Example

Extensive used in environmentally friendly sewage treatment, water lever control, drainage and irrigation, etc.. Water level above 40%, Pumping in full-frequency; Below 40%, slow pumping; Below 10%, stop pumping.

### 7.7.3 Relevant Parameter Setting

Table 7.6.1 Electric contact pressure gauge control setting

| Code | Factory Setting | Recommend | Description |
|---|---|---|---|
| b00.00 | 65535 | 65535 | Password of entering parameter groups. Factory set is 65535, it can be modified by b06.09. |
| b08.01~ b08.05 | | | Ensure normal operation, must input parameter according to nameplate of Motor. |

| Code | Factory Setting | Recommend | Description |
|---|---|---|---|
| b00.02 | 0 | x | Motor rotating direction, set according to the actual motor wiring of spot. Make sure the motor is running in forward direction. |
| b02.02 | 0 | 1 | PID Output Characteristics, set as pumping characteristics. |
| b01.05 | 10.0 | 100.0 | Set as the range of water level transmitter. |
| b01.00 | 8.0 | 100.0 | High water pressure/level alarm value, set as the alarm water level. |
| b01.01 | 0.5 | 10.0 | Low water pressure/level alarm value, water level below this value stop pumping. |
| b00.01 | 3.0 | 40.0 | The full-frequency pumping water level, above this value full-frequency pumping, below b00.01 and above b01.01 pumping with the setting frequency of b05.07. |
| Below need to set based on working conditioning and user's requirement. | | | |
| b01.06 | | | Water level transmitter calibration, b01.06 use to adjust transducer zero bias;<br>b01.08 use to accordant the display pressure and the transducer pressure; When display smaller than gauge, decrease b01.08; When display bigger than gauge, increase b01.08. |
| b01.08 | | | |
| b01.02 | 20 | xx | Low pressure running time, set according to actual condition, determine LP detect running time, keep the factory set is OK. |
| b05.09 | 10 | 30 | Low water level restart delay time, restart with the value setting after a LP delay; Manual restart after low water level need not to change this parameter. |

## 7.8 Application Summary

B603 intelligent water supply controller owns powerful function, to be intelligent water supply, beside previous typical applications, it covers most applications. Such as, air conditioning cold water pump, cooling pump constant temperature automatic control, hot water circulation system(include solar energy, heat pump water supply etc.), water treatment system, garden landscape, industry and agriculture production water supply system. User is urged according to spot condition and various functions of B603 to fulfill a good performance water supply.

B603 intelligent constant water supply controller haven't special demands to peripherals, it almost can be use the normal component. Such as water detection use transducer, transmitter (include water level transmitter, temperature transmitter, etc.) or inductive remote transmission pressure gauge, its output is 4~20mA, 0~5VDC and 0~10 VDC standard signal. For a easy control, use an electric contact pressure gauge or pressure switch can be achieved; Water level switch can use the float switch or pressure switch and so on general application device. All of this allows user according to the work condition select appropriate peripheral device.

# 8. FAULT AND TROUBLE SHOOTING

## 8.1 System Running Fault and Trouble Shooting

| Abnormal Function | Reason | Solution |
|---|---|---|
| Can't Sleep | 1. Outlet pipe leakage;<br>2. Check valve leakage;<br>3. Pressure tank damage;<br>4. High environment EMI;<br>5. Wrong parameter | ● Check outlet pipe, or to set b04.04;<br>● Inspect check valve;<br>● Change pressure tank;<br>● Transducer adopt shielded wires, shielded layer connect to PE;<br>● Ensure b04.00＝1 |
| Display Pressure Error | 1. Detector error;<br>2. Wrong parameter;<br>3. Transducer wires is too long | ● Adopt standard detector;<br>● Calibration parameter b01.05，b01.08;<br>● Avoid use too long transducer wires |
| Full-Frequency Running | 1. Lose pressure feedback;<br>2. Wrong parameter;<br>3. Pump under power | ● Check transducer and wires;<br>● b05.02 should not be set as 1;<br>● S2-Com should be open;<br>● Set b07.14＝1, take a factory reset |
| Pressure Vibration, Stabilize Slow | 1. PID value unmatched;<br>2. Acc. /Dec. time too fast;<br>3. Big delay on pressure feedback | ● Tune PI value b02.03, b02.04;<br>● Tune Acc./Dec. time b05.03, b05.04;<br>● Avoid use too long transducer wires |
| Motor Noise | 1. Motor abnormal;<br>2. Motor installation is not stable;<br>3. Low carry-frequency | ● Check motor;<br>● Proper turn up carrier frequency b05.08 |

## 8.2 Water supply Running Fault and Trouble Shooting

| Fault Code | Fault Type | Reason | Solution |
|---|---|---|---|
| LP | Low Water Pressure | 1. Abnormal sensor;<br>2. Motor rotates in the reverse direction;<br>3. Insufficient water inflow;<br>4. There is air inside the pump | ● Check the installation of pressure transmitter;<br>● Check the motor's direction of rotation is correct or not;<br>● Check the parameter b01.01 (setting value too big);<br>● Check the pump whether is vent out the air inside |
| HP | High Water Pressure | 1. Abnormal sensor;<br>2. The parameter b01.00 setting value is too small | ● Check the installation of pressure transmitter;<br>● Check the parameter b01.00 (setting value too small) |
| LL | Low Water Level | 1. Water level of pool is too low;<br>2. Abnormal water level switch;<br>3. Wrong setting of water level switch style parameter | ● Check the water system<br>● Check the situation of the control terminal S3<br>● Check the parameter b05.00 |

| Fault Code | Fault Type | Reason | Solution |
|---|---|---|---|
| HL | High Water Pressure and Low Water Level (HP+LL) | 1. Abnormal sensor;<br>2. The parameter b01.00 setting value is too small;<br>3. Water level of pool is too low;<br>4. Abnormal water level switch;<br>5. Wrong setting of water level switch style parameter | ● Check the installation of pressure transmitter;<br>● Check the parameter b01.00 (setting value too small)<br>● Check the water system<br>● Check the situation of the control terminal S3<br>● Check the parameter b05.00 |
| E022 | Sensor Fault | 1. Pressure transmitter disconnected;<br>2. Wrong pressure transmitter wiring;<br>3. Pressure transmitter short circuit;<br>4. Pressure transmitter break down | ● Check the cable between pressure transmitter and controller;<br>● Check the sensor whether is normal |

## 8.3 Controller Running Fault and Trouble Shooting

| Fault Code | Fault Type | Reason | Solution |
|---|---|---|---|
| E001 | IGBT Ph-U Fault (OUT1) | 1. Acc/Dec time is too short;<br>2. IGBT module fault;<br>3. Malfunction caused by interference;<br>4. Grounding is not properly | ● Increase Acc/Dec time;<br>● Check external equipments and eliminate interference;<br>● Ask supplier for support |
| E002 | IGBT Ph-V Fault (OUT2) | | |
| E003 | IGBT Ph-W Fault (OUT3) | | |
| E004 | Over-current When Acceleration (OC1) | 1. Acc time is too short;<br>2. Low input voltage;<br>3. The power of controller is small | ● Prolong Acc time;<br>● Check the power supply;<br>● Select bigger power controller |
| E005 | Over-current When Deceleration (OC2) | 1. Dec time is too short;<br>2. Load is too heavy;<br>3. The power of controller is small | ● Prolong Dec. time;<br>● Increase braking unit;<br>● Select bigger capacity controller |
| E006 | Over-current When Constant Speed Running (OC3) | 1. Sudden change of load;<br>2. Low input voltage;<br>3. The power of controller is small | ● Check the load;<br>● Check the power supply;<br>● Select bigger capacity controller |
| E007 | Over-voltage When Acceleration (OV1) | 1. High input voltage;<br>2. Regenerative energy from the motor is too large | ● Check the power supply;<br>● Avoid to restart the motor until it stop running completely |
| E008 | Over-voltage When Deceleration (OV2) | 1. Dec time is too short;<br>2. Load is too heavy;<br>3. High input voltage | ● Increase Dec. time;<br>● Increase braking unit;<br>● Check the power supply |

| Fault Code | Fault Type | Reason | Solution |
|---|---|---|---|
| E009 | Over-voltage When Constant Speed Running (OV3) | 1. High input voltage;<br>2. Load is too heavy | ● Install input reactor;<br>● Increase braking unit |
| E010 | DC Bus Under-voltage (UV) | 1. Low input voltage | ● Check the grid's input power supply |
| E011 | Motor Overload (OL1) | 2. Low input voltage;<br>3. Wrong setting of motor parameter;<br>4. Motor locked-rotor or sudden big change of load to small load;<br>5. The power of motor is too small | ● Check the power supply;<br>● Set the rated current of motor properly;<br>● Check the load, adjust the value of torque boost;<br>● Select proper power motor |
| E012 | Controller Overload (OL2) | 1. Acc time is too short;<br>2. Restart the motor when it is decelerating;<br>3. Low input voltage;<br>4. Load is too heavy | ● Prolong Acc time;<br>● Avoid to restart the motor until it stop running completely;<br>● Check the power supply;<br>● Select bigger capacity controller |
| E013 | Input Phase Failure (SPI) | 1. Open-phase occurred in power supply | ● Check the wiring, installation and the power supply |
| E014 | Output Phase Failure (SPO) | 1. Open-phase occurred at output side of main circuit | ● Check the output wiring, cable and motor |
| E015 | Rectify Overheat (OH1) | 1. Sudden over-current;<br>2. Input/output side has short circuit;<br>3. Cooling fans of controller stopped or damaged;<br>4. Ambient temperature is too high;<br>5. Wires or connectors of control board are loose;<br>6. Auxiliary power supply unit is damaged or low driving voltage for IGBT;<br>7. Power module bridge is damaged;<br>8. Control board is abnormal | ● Refer to measures of over-current;<br>● Check the wiring;<br>● Replace cooling fans;<br>● Decrease the ambient temperature;<br>● Check and reconnect;<br>● Ask supplier for support |
| E016 | IGBT Overheat (OH2) | | |
| E018 | Reserve | | |

| Fault Code | Fault Type | Reason | Solution |
|---|---|---|---|
| E019 | Current Detection Fault (ITE) | 1. Wires or connectors of control board are loose;<br>2. Auxiliary power supply unit is damaged;<br>3. Current detector is damaged or amplifying circuit is abnormal | ● Check the wiring and connectors;<br>● Ask supplier for support |
| E020 | Reserve | | |
| E021 | EEPROM Fault(EEP) | R/W fault of control parameters | ● Press STOP/RST to reset;<br>● Ask for support |



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