

Operation manual of frequency converter for pool pump



(The download password is 123)

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Appendix: transducer fault code table

1. Special instruction

Except otherwise specified, this instruction is applicable to operation guide for transducer control panel of all the swimming pool machines of our company.

2. Overview

The controller is the external controller mating swimming pool transducer. The specific functions are as follows:

- Time display: real-time clock display;
- Monitoring parameter: motor running speed and real-time power;
- Speed gears: four gears of running speed for option;
- Parameter setup: real-time clock, four gears of running speed, four groups of scheduled task, water shortage protection and self-priming function setup.
- Fault display: fault codes of over-current, over-voltage, under-voltage, overheating and water shortage protection etc.
- Automatic reset: after over-current, over-voltage, overheating and power failure, the previous running status will be restored automatically.
- Power failure recovery: recover power after power failure, and automatically restore the status before power failure.
- Safety vacuum release system (SVRS), reserved.

3. Specification of control panel

The control panel is used to start and stop transducer water pump, with functions of setup and changing speed (RPM), visiting transducer pump and setup related variable frequency parameters.

3.1 Definitions of key functions

- Key 1 (Speed 1): press to select speed 1 (750RPM); meanwhile, LED is on and it means that current running speed is speed 1;
- Key 2 (Speed 2): press to select speed 2 (1500RPM); meanwhile, LED is on and it means that current running speed is speed 2;
- Key 3 (Speed 3): press to select speed 3 (2400RPM); meanwhile, LED is on and it means that current running speed is speed 3;
- Key 4 (CUSTOM): press to select speed 4 (3000RPM); meanwhile, LED is on and it means that current running speed is speed 4;
- Key 5 (Menu): When transducer is in halt mode, enter content of main menu;
- Key 6 (Back): Return to previous menu and do not save current setup;
- Key 7 (Menu): Enter next menu or save current setup and return to previous menu;
- Key 8 (Direction key):
 - Up key: move up the menu or increase data during number editing;
 - Down key: move down the menu or decrease data during number editing;
 - Left key: move one number position to the left during editing;
 - Right key: move one number position to the right during editing;
- Key 9 (Quick Clean): quick clean mode;
- Key 10 (Time Out): during activation, allow the pump to maintain halted state for a while and restore normal status.
- Key 11 (Start/Stop): start or stop the pump. When the indicator light is on, water pump is running or enters holding state of scheduled task mode;
- Key 12 (Reset): reset fault;



- Key 11 (Start/Stop): start or stop the pump. When the indicator light is on, water pump is running or enters holding state of scheduled task mode;
- Key 12 (Reset): reset fault;

3.2 Definition of LED indicator light

- On: green, indicating power on of water pump;
- Warning: yellow, warning indicator light;
- Alarm: red, indicating alarm status;

3.2 Definition of LED indicator light

- On: green, indicating power on of water pump;
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3.3 Definitions of LCD display contents

- First line: display password protection status and current time. If password protection is not started, icon of key will not be displayed;
- Second line: display current pump speed (RPM);
- Third line: display countdown and power (W) of current operating task;
- Fourth line: current pump running mode;

4. Start and stop water pump

4.1 Start water pump

- Please ensure the water pump is correctly powered on, and the green power indicator light is on.
- Press one of the keys for speed 1-4, and press key 11 (Start/Stop) to activate the water pump; meanwhile, the running indicator light will be on. At this moment, if self-priming function is started, water pump will enter self-priming mode before running of this mode.

4.2 Stop water pump

When the pump is running, press key 11 (Start/Stop) to stop the pump; meanwhile, corresponding running indicator light will be off.

4.3 Quickly adjust and maintain running speed of water pump

- When water pump is running, press direction key to adjust required speed value (step length is 50RPM).
- Press the corresponding key of current running mode for 3s to save the setup value. If it is not saved, it is temporary speed regulation and the original setting will be operated in next start.

4.4 Start preset RPM operating mode

Water pump is programmed to 4 default RPM, i.e. 750, 1500, 2400 and 3000RPM, corresponding to the speed of speed key 1-4, as shown below.

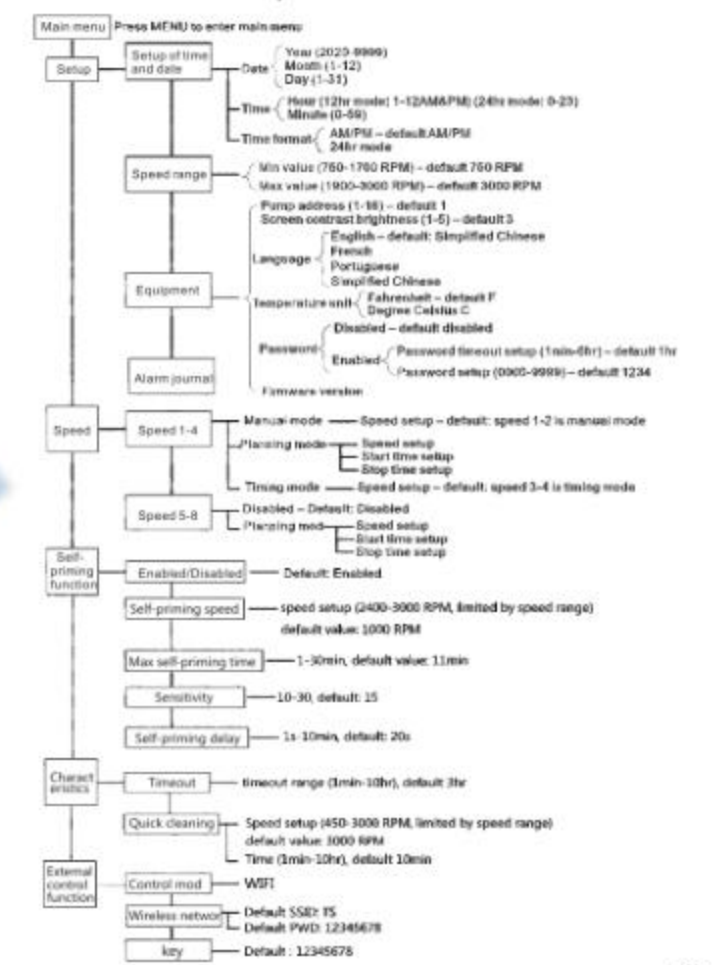
- Please make sure the water pump is correctly powered on, and the green power indicator light is on.
- Gently press (brief press) any speed key and the LED indicator light above the key will be on.
- Press key 11 (Start/Stop) and water pump will be switched to the RPM of this mode immediately.

LED Indicator light



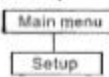
Note: Step 2) and 3) can be exchanged.

5. Structure chart of control panel menu



Please note that menu structure may be modified without notice.

5.1 Menu setup



5.1.1 Date and time setup

Real-time clock control includes all the scheduled task times and default functions. The design outage operation of real-time clock is as long as 48 hours, which means that time will be reset automatically after poweroff for over 48 hours. Factory reset time will be restored when it is powered on again, and it will remind users to reset time.

- Make sure controller has been correctly powered on (green power indicator light is on)
- Make sure water pump is shut down

3) Press key 5 (Menu) to enter the main menu;

4) Roll to "Setups" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

5) Roll to "Date and Time" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

6) Roll to "Date" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

7) Set up values through key 8 direction key \leftarrow and move the cursor through \leftarrow and press key 7 (Enter) to save the setup and return to the previous menu; or press key 6 (Back) to give up and return to the previous menu;

8) Roll to "Time" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

9) Set up values through key 8 direction key \leftarrow and move the cursor through \leftarrow and press key 7 (Enter) to save the setup and return to the previous menu; or press key 6 (Back) to give up and return to the previous menu;

10) Roll to "Hour Format" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

11) Set up values through key 8 direction key \leftarrow and move the cursor through \leftarrow and press key 7 (Enter) to save the setup and return to the previous menu; or press key 6 (Back) to give up and return to the previous menu;

5.1.2 Speed range setup (RPM)

The upper and lower limit of speed setup of each task will be limited by speed range. However, if the max RPM set value is lower than the min speed of self-priming task (2000 RPM), the max speed during operation of self-priming task will exceed the max speed set here.

5.1.2.1 Setup of min RPM

The setup range of min RPM is 750 RPM-1700 RPM and default setup is 750 RPM. This value is used to limit the min RPM of water pump.

- Make sure controller has been correctly powered on (green power indicator light is on)
- Make sure water pump is shut down

3) Press key 5 (Menu) to enter the main menu;

4) Roll to "Setups" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

5) Roll to "Speed Rang" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

6) Roll to "Min Speed" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

7) Set up values through key 8 direction key \leftarrow and move the cursor through \leftarrow and press key 7 (Enter) to save the setup and return to the previous menu; or press key 6 (Back) to give up and return to the previous menu;

5.1.2.2 Setup of max RPM

The setup range of max RPM is 1900 RPM-3000 RPM and default setup is 3000 RPM. This value is used to limit the max RPM of water pump.

- Make sure controller has been correctly powered on (green power indicator light is on)
- Make sure water pump is shut down

3) Press key 5 (Menu) to enter the main menu;

4) Roll to "Setups" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

5) Roll to "Speed Rang" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

6) Roll to "Max Speed" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

7) Set up values through key 8 direction key \leftarrow and move the cursor through \leftarrow and press key 7 (Enter) to save the setup and return to the previous menu; or press key 6 (Back) to give up and return to the previous menu;

5.1.3 Setup of pump device address

The setup range of pump address is 1-16 and default pump address is 1. Only when more than 1 pump exists in control system, will modification be required. Address will be modified to enable control system to command the unique pump identifying this address through addressing.

- Make sure controller has been correctly powered on (green power indicator light is on)
- Make sure water pump is shut down

3) Press key 5 (Menu) to enter the main menu;

4) Roll to "Setups" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

5) Roll to "Device" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

6) Roll to "Pump Address" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

7) Set up values through key 8 direction key \leftarrow and move the cursor through \leftarrow and press key 7 (Enter) to save the setup and return to the previous menu; or press key 6 (Back) to give up and return to the previous menu;

5.1.4 Setup of screen contrast brightness

The setup range of screen contrast brightness is 0-8 and default setup is 3. Setup can be performed according to actual ambient brightness.

- Make sure controller has been correctly powered on (green power indicator light is on)
- Make sure water pump is shut down

3) Press key 5 (Menu) to enter the main menu;

4) Roll to "Setups" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

5) Roll to "Device" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

6) Roll to "Screen Contrast" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

7) Set up values through key 8 direction key \leftarrow and move the cursor through \leftarrow and press key 7 (Enter) to save the setup and return to the previous menu; or press key 6 (Back) to give up and return to the previous menu;

5.1.5 Language setup

Currently, this system supports the following 4 languages: 1 English, 2 French, 3 Spanish and 4 Simplified Chinese.

- Make sure controller has been correctly powered on (green power indicator light is on)
- Make sure water pump is shut down

3) Press key 5 (Menu) to enter the main menu;

4) Roll to "Setups" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

5) Roll to "Device" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

6) Roll to "Language" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

7) Set up values through key 8 direction key \leftarrow and move the cursor through \leftarrow and press key 7 (Enter) to save the setup and return to the previous menu; or press key 6 (Back) to give up and return to the previous menu;

5.1.6 Setup of temperature unit

Temperature unit can be set as Celsius degree (°C) of Fahrenheit (°F). The default setup is Fahrenheit (°F).

- Make sure controller has been correctly powered on (green power indicator light is on)
- Make sure water pump is shut down

3) Press key 5 (Menu) to enter the main menu;

4) Roll to "Setups" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

5) Roll to "Device" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

6) Roll to "TempUnits" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

7) Set up values through key 8 direction key \leftarrow and move the cursor through \leftarrow and press key 7 (Enter) to save the setup and return to the previous menu; or press key 6 (Back) to give up and return to the previous menu;

5.1.7 Keyboard password protection setup

Password protection function is enabled by default. This function is to lock the control panel to avoid misoperation. After this function is started, you will be asked to enter a password when you use control panel beyond the set protective time. The password is composed of four random numbers.

- Notes:
- No matter if password function is started, key 11 (Start/Stop) can be operated at any time.
 - When password protection function is started, other keys except key 11 (Start/Stop) will be disabled. Meanwhile, the screen will display "Please enter password" when a key is pressed (except key 11 (Start/Stop)).
 - When password function is started, a key icon will be displayed at left upper side of screen after control panel is locked.

5.1.7.1 Password setup

- Make sure controller has been correctly powered on (green power indicator light is on)
- Make sure water pump is shut down

3) Press key 5 (Menu) to enter the main menu;

4) Roll to "Setups" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

5) Roll to "Device" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

6) Roll to "Password" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

7) Switch "Enabled"/"Disabled" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

8) Set up values through key 8 direction key \leftarrow and move the cursor through \leftarrow and press key 7 (Enter) to save the setup and return to the previous menu; or press key 6 (Back) to give up and return to the previous menu;

9) Roll to "Options" through key 8 direction key \leftarrow and press key 7 (Enter) to enter;

10) Set up values through key 8 direction key \leftarrow and move the cursor through \leftarrow and press key 7 (Enter) to save the setup and return to the previous menu; or press key 6 (Back) to give up and return to the previous menu;

5.1.7.2 Password input

When the keyboard is locked,

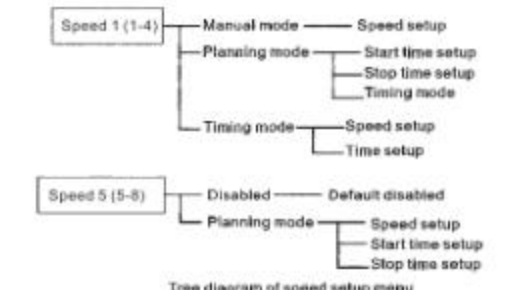
- Press any key (except key 11 (Start/Stop)) and key 11 (Start/Stop) to enter the interface to enter password.
- Set up values through key 8 direction key \leftarrow and move the cursor through \leftarrow and press key 7 (Enter) to confirm the input.

5.2 Menu of speed mode



5.2.1. Setup of pump operation mode

The programmable control pump of this controller can work for 3 different working modes, i.e. manual mode, planning mode and timing mode. Quick mode 1-4 can be randomly switches by 3 modes. There are corresponding key for quick mode 5-8 on control panel but this mode can only be used for timing mode. Default setting of quick mode 5-8 is prohibition.



Tree diagram of speed setup menu

5.2.1.1 Manual mode

This mode can only be used for speed 1-4, triggered by corresponding key on control panel.

Under manual mode, firstly press any key mode of quick mode 1-4 and then press key 11 (the sequences can be exchanged); the pump will operate at the corresponding speed of this mode.

5.2.1.2 Planning mode

Speed 1-8 can be set in planning mode. Timing start and stop are programmed within 24 hours.

Speed in timing mode will cover any speed in manual mode (pump operation triggered by manual mode will be switched to timing task automatically).

Under timing mode, speed 1-8 can be programmed as operation at specific speed on specific time within 24 hours.

This task is triggered by key 11 . After pressing , when current system time is identical to any starting time of speed 1-8, the system will enable operation at the speed of this task. If is pressed at this moment, the system will stop operation and will not restart any task under timing mode (no matter it is within timing period) until is pressed again.

5.2.1.3 Timing mode

Timing mode can be set for speed 1-4, among which, speed 3-4 is defaulted for timing mode.

Under timing mode, when any key of speed 1-4 is pressed and key 11 is pressed (the sequence can be exchanged), the pump will operate at the corresponding speed of this mode and will automatically terminate operation when set time is due.

5.2.2 Parameter setup under manual mode (only speed 1-4)

- 1) Make sure controller has been correctly powered on (green power indicator light is on)
- 2) Make sure water pump is shut down
- 3) Press key 5 to enter the main menu;
- 4) Roll to "Speed" through key 8 direction key and press key 7 to enter;
- 5) Roll to "Speed 1" (1-4, any item to be set) through key 8 direction key and press key 7 to enter;
- 6) Press key 7 to enter edit mode and set values through key 8 direction key ; select "Manual Mode" and press key 7 to confirm and exit edit mode; or press key 6 to give up and return to the previous menu;
- 7) Enter "Speed Setup" through key 8 direction key and press key 7 to enter edit mode;
- 8) Set values through key 8 direction key and move the cursor through , and press key 7 to save the setup and exit edit mode; press key 6 to return to the previous menu; or directly press key 6 to give up and return to the previous menu;

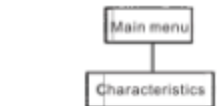
5.2.3 Parameter setup under planning mode (only speed 1-4)

- 1) Make sure controller has been correctly powered on (green power indicator light is on)
- 2) Make sure water pump is shut down
- 3) Press key 5 to enter the main menu;
- 4) Roll to "Speed" through key 8 direction key and press key 7 to enter;

5.3.6 Self-priming parameter setup

- 1) Make sure controller has been correctly powered on (green power indicator light is on)
- 2) Make sure water pump is shut down
- 3) Press key 5 to enter the main menu;
- 4) Roll to "Self-priming Function" through key 8 direction key and press key 7 to enter;
- 5) Roll to "Switch" through key 8 direction key and press key 7 to enter;
- 6) Set up values through key 8 direction key and move the cursor through , and press key 7 to save the setup and return to the previous menu; or press key 6 to give up and return to the previous menu;
- 7) Enter "Speed" through key 8 direction key and press key 7 to enter;
- 8) Set up values through key 8 direction key and move the cursor through , and press key 7 to save the setup and return to the previous menu; or press key 6 to give up and return to the previous menu;
- 9) Enter "Time" through key 8 direction key and press key 7 to enter;
- 10) Set up values through key 8 direction key and move the cursor through , and press key 7 to save the setup and return to the previous menu; or press key 6 to give up and return to the previous menu;
- 11) Enter "Self-priming Sensitivity" through key 8 direction key and press key 7 to enter;
- 12) Set up values through key 8 direction key and move the cursor through , and press key 7 to save the setup and return to the previous menu; or press key 6 to give up and return to the previous menu;

5.4 Characteristics



5.4.1 Timeout function

Timeout function will enable the pump to maintain at shutdown status for a while and then restore normal condition. The displayed status is hour : min.

Once timeout is finished, the system will recover the operating mode before this operation, and operation indicator light will keep on to prepare for next task of timing mode.

- Setup flow is as follows:
- 1) Make sure controller has been correctly powered on (green power indicator light is on)
 - 2) Make sure water pump is shut down
 - 3) Press key 5 to enter the main menu;
 - 4) Roll to "Characteristic Function" through key 8 direction key and press key 7 to enter;
 - 5) Roll to "Time Out" through key 8 direction key and press key 7 to enter;
 - 6) Set up values through key 8 direction key and move the cursor through , and press key 7 to save the setup and return to the previous menu; or press key 6 to give up and return to the previous menu;

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- 5) Roll to "Speed 1" (1-4, any item to be set) through key 8 direction key and press key 7 to enter;
- 6) Press key 7 to enter edit mode and set values through key 8 direction key ; select "Planning Mode" and press key 7 to confirm and exit edit mode; or press key 6 to give up and return to the previous menu;
- 7) Enter "Speed Setup" through key 8 direction key and press key 7 to enter edit mode;
- 8) Set values through key 8 direction key and move the cursor through , and press key 7 to save the setup and exit edit mode; press key 6 to return to the previous menu; or directly press key 6 to give up and return to the previous menu;
- 9) Enter "Start Time Setup" through key 8 direction key and press key 7 to enter edit mode;
- 10) Set values through key 8 direction key and move the cursor through , and press key 7 to save the setup and exit edit mode; press key 6 to return to the previous menu; or directly press key 6 to give up and return to the previous menu;
- 11) Enter "Stop Time Setup" through key 8 direction key and press key 7 to enter edit mode;
- 12) Set values through key 8 direction key and move the cursor through , and press key 7 to save the setup and exit edit mode; press key 6 to return to the previous menu; or directly press key 6 to give up and return to the previous menu;

5.2.4 Parameter setup under timing mode (only speed 1-4)

- 1) Make sure controller has been correctly powered on (green power indicator light is on)
- 2) Make sure water pump is shut down
- 3) Press key 5 to enter the main menu;
- 4) Roll to "Speed" through key 8 direction key and press key 7 to enter;
- 5) Roll to "Speed 1" (1-4, any item to be set) through key 8 direction key and press key 7 to enter;
- 6) Press key 7 to enter edit mode and set values through key 8 direction key ; select "Timing Mode" and press key 7 to save the setup and exit edit mode; or press key 6 to give up and return to the previous menu;
- 7) Enter "Speed Setup" through key 8 direction key and press key 7 to enter edit mode;
- 8) Set values through key 8 direction key and move the cursor through , and press key 7 to save the setup and exit edit mode; press key 6 to return to the previous menu; or directly press key 6 to give up and return to the previous menu;
- 9) Enter "Timing Time Setup" through key 8 direction key and press key 7 to enter edit mode;
- 10) Set values through key 8 direction key and move the cursor through , and press key 7 to save the setup and exit edit mode; press key 6 to return to the previous menu; or directly press key 6 to give up and return to the previous menu;

5.4.2 Quick cleaning function

During cleaning and water changing etc for swimming pool, this function will enable quick implementation according to set value and set time.

Press key 9 (LED indicator light is on) and press key 11 to start (the sequence can be exchanged). When operational cycle of quick cleaning function is finished, the system will start timing task or be standby for timing task.

Setup flow is as follows:

- 1) Make sure controller has been correctly powered on (green power indicator light is on)
- 2) Make sure water pump is shut down
- 3) Press key 5 to enter the main menu;
- 4) Roll to "Characteristic Function" through key 8 direction key and press key 7 to enter;
- 5) Roll to "Quick Clean" through key 8 direction key and press key 7 to enter;
- 6) Set up values through key 8 direction key and move the cursor through , and press key 7 to save the setup and return to the previous menu; or press key 6 to give up and return to the previous menu;

5.5 External control



This function provided an external interface for user control system to visit pump. For example, terminal equipment 3 and 4 are connected to user control center; when this control panel receives order from user control system, the system will enable the pump to operate at the set speed.

Currently, only wifi LAN control is supported, in which

- 1) Default wifi is TS
 - 2) Default wifi password is 12345678
 - 3) Default key is 12345678. Key is used to connect with the exclusive APP on mobile terminal equipment. Synchronized setup is required for connection.
- Setup flow is as follows:
- 1) Make sure controller has been correctly powered on (green power indicator light is on)
 - 2) Make sure water pump is shut down
 - 3) Press key 5 to enter the main menu;
 - 4) Roll to "Ext. Control" through key 8 direction key and press key 7 to enter;
 - 5) Roll to "Wifi" through key 8 direction key and press key 7 to enter;
 - 6) Wait for searching of wifi nearby and the displayed code is "In Search"; the first wifi name searched will be displayed after searching;

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5.2.5 Parameter setup under planning mode (only speed 1-4)

- 1) Make sure controller has been correctly powered on (green power indicator light is on)
- 2) Make sure water pump is shut down
- 3) Press key 5 to enter the main menu;
- 4) Roll to "Speed" through key 8 direction key and press key 7 to enter;
- 5) Roll to "Speed 5" (5-8, any item to be set) through key 8 direction key and press key 7 to enter;
- 6) Press key 7 to enter edit mode and set values through key 8 direction key ; select "Enable" and press key 7 to confirm and exit edit mode; or press key 6 to give up and return to the previous menu;
- 7) Enter "Speed Setup" through key 8 direction key and press key 7 to enter edit mode;
- 8) Set values through key 8 direction key and move the cursor through , and press key 7 to save the setup and exit edit mode; press key 6 to return to the previous menu; or directly press key 6 to give up and return to the previous menu;
- 9) Enter "Start Time Setup" through key 8 direction key and press key 7 to enter edit mode;
- 10) Set values through key 8 direction key and move the cursor through , and press key 7 to save the setup and exit edit mode; press key 6 to return to the previous menu; or directly press key 6 to give up and return to the previous menu;
- 11) Enter "Stop Time Setup" through key 8 direction key and press key 7 to enter edit mode;
- 12) Set values through key 8 direction key and move the cursor through , and press key 7 to save the setup and exit edit mode; press key 6 to return to the previous menu; or directly press key 6 to give up and return to the previous menu;

5.2.6 Set planning mode without time cycle

Starting time and stop time can't be set to the same in one timing task; otherwise, it will be regarded as invalid setup by the system and this task will not be implemented.

If users want a timing task to be operated at constant speed, starting time can be set as one minute after stop time. For example:

- Starting time: 08:00AP
 - Stop time: 07:59AP
- If this task is started, it will not stop automatically until key 11 is pressed.
- Notes:
- a) The system will not implement task of timing mode until key 11 is pressed (LED indicator light is on) to set the system to the status implementing tasks under timing mode.
 - b) If current system time is in multiple planned timing tasks, the system will switch to the fastest speed task

- 7) Select targeted wifi through key 8 direction key and press key 7 to input wifi password; or press key 6 to give up and return to the previous menu;
- 8) Input numbers through key 8 direction key and move the cursor through , and press key 7 to save the setup and return to the previous menu; or press key 6 to give up and return to the previous menu;
- 9) Roll to "Key" through key 8 direction key and press key 7 to enter;
- 10) Set values through key 8 direction key and move the cursor through , and press key 7 to save the setup and return to the previous menu; or press key 6 to give up and return to the previous menu;

6. Attention

6.1 Rules for parameter setup

All the numerical parameters are set by "digit" (units digit, tens digit, hundreds digit and thousands digit) according to addition and subtraction rules; periodic mode is used as preferential setup.

- 1) When low order is more than ten, move forward by one
- 2) When low order is insufficient, borrow one from ahead
- 3) Add to max value and return to min value
- 4) Deduct to min value and return to max value

6.2 Rules for time setup of timing mode

Start time and stop time support the definition crossing 24 hours (over 0 o'clock), and also support setup of Speed 1-8 overlapping time (the overlapped part and speed prevail). For example:

Speed1:
Start time: 22:00
Stop time: 03:00
The setting system believes that operation is started 22 o'clock today until 3 o'clock on the second day.

Speed2:
Speed: 1350
Start time: 07:00
Stop time: 13:00
Speed3:
Speed: 2700
Start time: 12:00
Stop time: 15:00

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c) Under operating condition, when a new task order is triggered by manual mode, the system will preferentially handle the latest order rather than consider speed. (For example, it is 10 o'clock now and operation is ongoing under the 1500RPM planned mode within 8-12 o'clock; if the user presses speed one 750RPM, the water pump will operate at 750RPM until 12 o'clock when this planned timing task is finished. The speed of next planned mode will not be affected).

5.3 Self-priming function



The default setting: Disabled.

5.3.1 Enable/disable

The default setting: Disabled.
After starting, water level of the basket in pump will be automatically detected once before every operation. When water pump is started, it will suspend for 3s after the speed reaches 1600 RPM. If there is sufficient water in the basket in pump 3s later, self-priming mode will be stopped to enter normal operating mode.

5.3.2 Self-priming speed

The default setting: 3000 RPM
Setup range of self-priming speed is 2400 RPM - 3000 RPM (limited by speed range). It is set according to actual condition. This value shall be properly increased if the pipeline is long.

5.3.3 Max self-priming time

The default setting: 11min
Setup range of max self-priming time is 1-30min. This value will allow the system submit max self-priming time before no flow (fault code: NF). If alarm is sent, make sure water supply is sufficient to refill the water in the basket in water pump to restart the pump.

5.3.4 Self-priming sensitivity

The default setting: 15
Setup range of self-priming sensitivity is 10-30. The smaller the value is, the more sensitive the detection is. High water level in the basket is required at the moment; otherwise, self-priming is likely to be triggered. The larger the value is, the poorer the sensitivity is. Detection can withdraw when the water level in the basket is not fully filled to start operation at normal speed, which will make the system unstable.
This parameter shall set according to actual situation.

5.3.5 Self-priming delay

The default value: 20s
Setup range of self-priming delay is 1s-10min.
If there is no sufficient water in the basket after self-priming mode is started, the system will operate at max speed for 20s (or set time).
In order to make the pump stable before operation at target speed, self-priming delay time may need to be increased. If controller keeps displaying start error (fault code: NF), this problem can be solved by continuing increasing self-priming delay time.

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The overlapped time of the system is 12:00-13:00 and speed shall prevail, i.e. it will switch to Speed 3 mode since 12:00, both speed and operating mode.

The following format of setup is valid. See details in Set planning mode without time cycle.

- Start time: 08:00AP
- Stop time: 07:59AP

Appendix: transducer fault code table

Display	Name of fault	Cause of fault
OC1	Over-current in speed change	Excessive speed acceleration; excessive load; motor is inconsistent with transducer
OC2	Over-current in speed stabilizing	Damaged module; output short circuit
OV1	Over-voltage in speed cut	Excessive speed deceleration; excessive or disconnected brake resistor value; failed brake module
OV2	Over-voltage in non-speed cut	Excessive input voltage; excessive motoring load; excessive or disconnected brake resistor value; failed brake module
OC3	Instant over-current	Excessive speed acceleration; excessive load; motor is inconsistent with transducer
UV1	Voltage below level	Power supply voltage below level; disconnected contactor or default input phase
OC4	Modular over-current	
OL3	Over-load of transducer	Excessive load; motor is inconsistent with transducer
CE	Fault of current transformer self-inspection	Affected by strong interference; poor mainboard
UV	Low control source	Input supply voltage is lower than specified voltage range
OH1	Over-heated module	Temperature of radiator is excessive; radiator fan fails
PF1	Input phase loss	Excessive load; motor is inconsistent with transducer; input phase loss; small power capacity; instant power failure
PF2	Output phase loss	Motor is disconnected or motor type is wrong
OS1	Over-speed	Excessive load or inappropriate control
OS2	Speed loss	Excessive load or inappropriate control
OL2	Over-torque	Excessive load or incorrect parameter setup
OL3	Max current/ transducer overload	Excessive load; motor stalling
OL1	Motor overload	Excessive load; motor is inconsistent with transducer
N F	Short of water; no flow	Water level in the pool is too low or water in water pump basket is insufficient during start