

# CLEVER POOL PRO

## INSTRUCTION MANUAL



The UK's Leading Independent Swimming Pool Manufacturer and Distributor

# CLEVER POOL PRO INSTRUCTION MANUAL

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**Please leave this instruction booklet with the owner as it contains important maintenance and safety information. Read this manual carefully before commencing installation.**

# 1. SAFETY AND CAUTION

## 1.1 READ BEFORE INSTALLATION

For your safety, please read these instructions carefully before using.

There are **DANGER** or **CAUTION** marks in this book. Please strictly obey when moving, installing, using or checking the product.



**DANGER**

|                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Please make sure to use the correct power supply.                                                                                                 |
| 2. Please make sure to close the control panel before power connection to avoid electric shock or explosion.                                         |
| 3. Please make sure not to confuse the input and output terminals.                                                                                   |
| 4. Please DO NOT touch the wire terminals when power is connected.                                                                                   |
| 5. Please wait 3 minutes after the power is cut off and all the indication lights are off for further maintenance.                                   |
| 6. Please DO NOT use wet hands for operation.                                                                                                        |
| 7. Please ask for professional help if you need to change any parts. It is strictly forbidden to leave any metal objects inside our Clever Pool Pro. |



**CAUTION**

|                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Installation based on local safety rules.                                                                                                            |
| 2. Only use professionals for installation and maintenance.                                                                                             |
| 3. Power connection is required after control panel is closed, otherwise you can suffer an electric shock.                                              |
| 4. Do not touch the terminals, otherwise you can suffer an electric shock.                                                                              |
| 5. Do not disconnect the wire connection if power is connected, serious personal damage will occur if you ignore this rule.                             |
| 6. Do not touch CMOS elements.                                                                                                                          |
| 7. No voltage duration test allowed for our Clever Pool Pro, it will damage semi-conductor elements.                                                    |
| 8. Make sure there is sufficient air ventilation when running in summer or high ambient temperature, this will avoid condensation and electrical fault. |
| 9. Please store our Clever Pool Pro in a dry, ventilated and cool place.                                                                                |

## 1.2 PRODUCT CHECK BEFORE INSTALLATION

Each Clever Pool Pro was 100% tested before delivery. You need to check the below by yourself:

- (1) If our Clever Pool Pro is the right model you ordered.
- (2) Any damage caused by transportation, if yes, please do not connect to power supply.

## 1.3 ENVIROMENT CAUTION

The correct enviroment for our Clever Pool Pro determines its correct function and life. So the installation must conform to the below:

- IP65 for both outdoor and indoor use
- No direct sunlight
- No corrosive fluid
- Away from radioactive or flammable substances
- Ambient temperature:-10°C~40°C
- No dust or metal scraps
- No electromagnetic interference

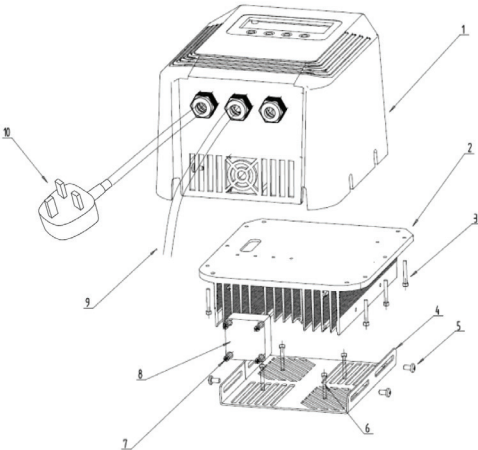
## 2. DIMENSION AND PARAMETERS

| PARAMETER SHEET   | CP101-15          | Dimension               |
|-------------------|-------------------|-------------------------|
| Input power       | Single-phase AC   | <br>185.9<br>129<br>233 |
| Input voltage     | 230V±15%          |                         |
| Input frequency   | 50/60 Hz          |                         |
| Output voltage    | 1~230V            |                         |
| PUMP TYPE         | SINGLE-PHASE      |                         |
| Max.Power         | MAX 2HP/1.5kw     |                         |
| Max current       | 14.4A             |                         |
| Mode option       | Manual or Auto    |                         |
| Cooling           | By air            |                         |
| Motor speed range | 50Hz:1200~2850rpm |                         |

### 3. INSTALLATION AND FUNCTION EXPLANATION

#### 3.1 INSTALLATION

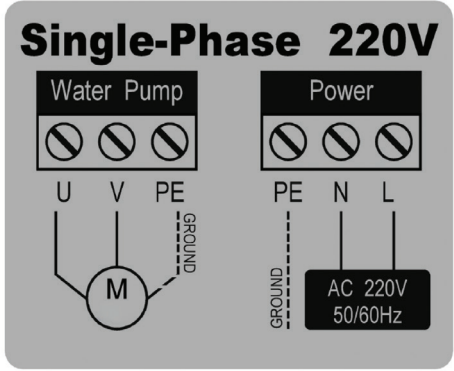
##### 3.1.1 Installation sketch and description

| Sketch for Installation                                                           | Procedure and Instruction                                                               |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
|  | 1. Use a cross head screwdriver to remove the screws (as shown 5 and plate 4).          |
|                                                                                   | 2. Put plate 4 in your installation place and use screws (as shown 6) to fix plate (4). |
|                                                                                   | 3. Put the control box (1) on plate (4) and fix with screws (as shown 5).               |
|                                                                                   | 4. Connect the wiring to the pump (as shown in 9).                                      |
|                                                                                   | 5. Connect plug (10) as shown to the correct power supply socket.                       |
|                                                                                   | 6. Strictly follow the operation steps as indicated in this manual.                     |

#### 3.2 WIRE CONNECTION

Wires have been pre-connected before delivery, if you need to re-connect the wires, please pay attention on below:

##### 3.2.1 Wire connection and description for ac220v Single phase in - Single phase out

| Wire connection sketch                                                              | Procedure and Instruction                                                                  |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
|  | 1. Disconnect power before opening the control panel.                                      |
|                                                                                     | 2. Make sure no connection between PE,N,L terminals and U,V terminals.                     |
|                                                                                     | 3. Wire connection should be done only when power is disconnected.                         |
|                                                                                     | 4. Check if the input voltage from the power supply is in compliance with Clever Pool Pro. |
|                                                                                     | 5. No voltage duration test.                                                               |
|                                                                                     | 6. Screw torque for terminal screws should be more than 1.7N.m.                            |
|                                                                                     | 7. Ground link must be connected before operation.                                         |
|                                                                                     | 8. Must use copper wires over 3G1.5mm2 for CP101-15.                                       |
|                                                                                     | 9. Power supply connected only after the control panel is closed.                          |

## 3.3 RUNNING AND OPERATION

### 3.3.1 Before running and operation

1. Check if installation and wire connection is 100% correct.
2. Check if any metal objects or debris are left in the product.
3. Check if wire terminals are well tightened.
4. Check if there are naked wires on the terminals touching other terminals.
5. Check if the control panel is firmly closed.
6. An RCD device must be used in the system.
7. Check if the power supply frequency is the same as Clever Pool Pro.

### 3.3.2 Programming guide

1. The Clever Pool Pro has two running modes: Manual mode and Auto mode.
  - 1.1. Manual mode is used when you are connecting to a pool chlorinator or timer. The system time settings are not required to run in this mode.
  - 1.2. Auto mode is used when there is no chlorinator or timer and includes up to 4 separate timers with individual speed options. This is ideal when you want to run your pool pump at different times and speeds to take advantage of different electrical consumption.
  - 1.3. In Manual mode press UP and DOWN buttons for 3 seconds to switch to Auto Mode. In Auto mode press UP and DOWN button for 3 seconds to switch to Manual Mode.

2. Manual mode:



The display will now show on the screen.

Press UP or DOWN button to increase or decrease the setting speed (50 rpm per time). Alternatively press SET button, it can quickly change speeds among LOW (1200 rpm), MEDI (1700 rpm), HIGH (2100 rpm) and BACK WASH (2850 rpm).



Press ON | OFF button to start or stop running. The Clever Pool Pro will store the speed and resume at that speed when it is switched on again.



To stop the pump, simply press the ON | OFF button again.

### 3. Current time setting.

Press ON | OFF and SET buttons together for 3 seconds. The hour of current time on the display will flash, press UP or DOWN button to increase or decrease the hour setting.



Press SET button to save the hour setting and step to the minute of current time setting, press UP or DOWN button to increase or decrease the minute setting. Press SET button to save and exit the current time setting.



#### 4. Auto Mode.

The display will now show  on the screen.



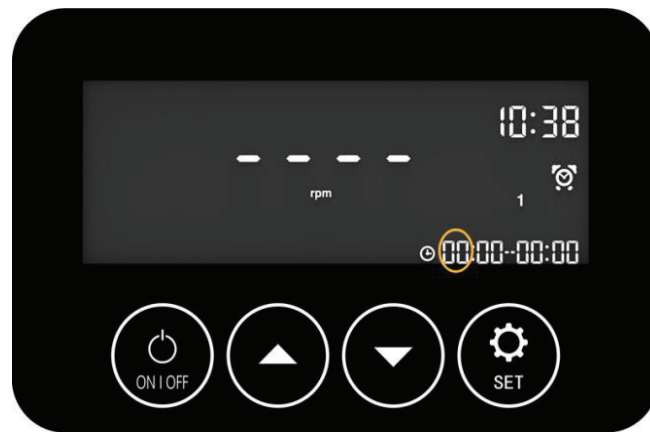
##### 4.1. Time Period.

In Auto Mode, there are four Time-periods that can be set, press UP or DOWN button can quickly check the Start Time, Stop Time and Running Speed of each Time-period if any of the Time-period have been set.



##### 4.2. Auto Mode Timer Setting and Speed Setting.

Press UP or DOWN button to choose which Time-period you want to set and press the SET button to enter into the setting page. The hour digits in start time will flash, Press UP or DOWN button to adjust the start hour and press SET button to save and step to minute setting, the minute digits will flash.



Press UP or DOWN button to adjust the start minute and press SET button to save and step to hour setting in stop time, the hour digits will flash.

Press UP or DOWN button to adjust the stop hour and press SET button to save and step to minute setting, the minute digits will flash.

Press UP or DOWN button to adjust the stop minute and press the SET button to save and step to running speed setting, the speed digits will flash.

Press UP or DOWN button to speed setting, the speed will start from 1200 rpm. You can adjust 50 rpm per press. After the setting is done, press SET button to save.



You can set one Time-period or any of the four Time-periods, once any of the Time-periods is saved, the programming will work accordingly.



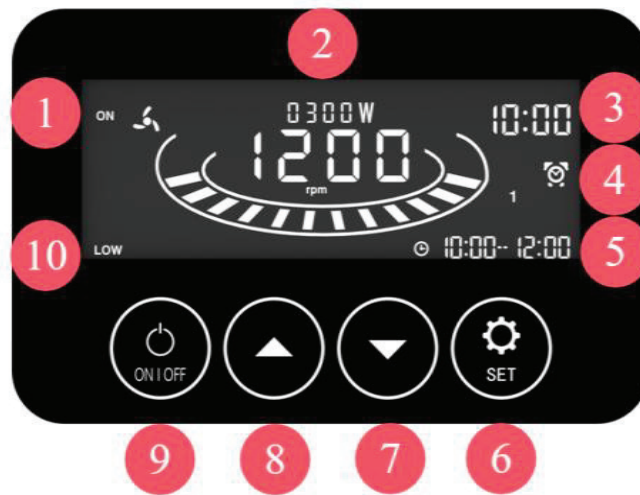
Press UP or DOWN button to move to other Time-periods and repeat steps above to set speed, start and stop time for Time-periods 2 or 3 or 4.



On Setting page, if no buttons are pressed after 1 minute, the programming will exit the setting page without saving. Or you can press the SET button for three seconds to exit the setting page quickly without saving.

#### 4. BUTTON AND FUNCTION EXPLANATION

| Number | Name                      | Explanation                                                                                      |
|--------|---------------------------|--------------------------------------------------------------------------------------------------|
| 1      | Power light               | On or Off indication                                                                             |
| 2      | Power and Speed           | Current power consumption and running speed                                                      |
| 3      | Time                      | Current time                                                                                     |
| 4      | Mode                      | Manual mode or Auto mode                                                                         |
| 5      | Time-Period               | Start and Stop time in Auto mode                                                                 |
| 6      | SET Button                | Switch quickly the default running speed in Manual mode or set/save the Time-period in Auto mode |
| 7      | DOWN Button               | Decrease RPM                                                                                     |
| 8      | UP Button                 | Increase RPM                                                                                     |
| 9      | ON/OFF Button             | Run or stop the pump                                                                             |
| 10     | Low/Medium/High Back Wash | Default speed setting in Manual mode                                                             |



## 5. PROTECTION AND TROUBLE SHOOTING

|   | Protection       | Code | Explanation                                                                                                                                                                                                                    |
|---|------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Too low voltage  | LU   | When the voltage is below 160V it shows LU on the screen, when the voltage comes back to normal from the grid, the error code disappears automatically.                                                                        |
| 2 | Over voltage     | OU   | When the voltage is over 285V it shows OU on the screen, when the voltage becomes normal from the grid, the error code disappears automatically.                                                                               |
| 3 | Over temperature | TP   | When the temperature in the casing is over 85°C, it shows TP on the screen until the temperature drops DOWN to 65°C, the error code disappears automatically.                                                                  |
| 4 | Over load        | OLP  | When the output power is 1.5 times higher than the rated power and working for 15 seconds, it shows OLP on the screen, it needs to cut off the power supply and eliminate the problem, then re-plug the power for normal work. |
| 5 | Short circuit    | OCP  | When the inverter is short-circuited or the output amper is 1.5 times higher, it shows OCP on the screen, it needs to cut off the power supply and eliminate the problem, then re-plug the power for normal work.              |

## 6. MODBUS PROTOCOL

### 6.1 RS485 COMMUNICATION INTERFACE

The baud rate is fixed at 9600, the data bit is 8 bits + 1 stop bits, no parity checkout bits. The default local address is 200 (0xC8).

#### Details as below:

1. Device address: Settable between 1 and 255.
2. Only MODBUS commands 03 and 06 are supported, 03 is only for Read, 06 is for both read and write.
3. Register definition:

| Hexadecimal address | Range     | Unit       | Definition                                 | Remarks    |                      |
|---------------------|-----------|------------|--------------------------------------------|------------|----------------------|
| 0x0000              | 0~1       |            | Working mode option                        | Read-write | 0: Auto<br>1: Manual |
| 0x0005              | 1200~2850 | RPM/Minute | RPM setting under manual mode              | Read-write |                      |
| 0x0009              | 0~1439    | Minute     | Timing period 1 start time under auto mode | Read-write |                      |
| 0x000a              | 0~1439    | Minute     | Timing period 1 stop time under auto mode  | Read-write |                      |
| 0x000b              | 0~1439    | Minute     | Timing period 2 start time under auto mode | Read-write |                      |
| 0x000c              | 0~1439    | Minute     | Timing period 2 stop time under auto mode  | Read-write |                      |
| 0x000d              | 0~1439    | Minute     | Timing period 3 start time under auto mode | Read-write |                      |
| 0x000e              | 0~1439    | Minute     | Timing period 3 stop time under auto mode  | Read-write |                      |
| 0x000f              | 0~1439    | Minute     | Timing period 4 start time under auto mode | Read-write |                      |
| 0x0010              | 0~1439    | Minute     | Timing period 4 stop time under auto mode  | Read-write |                      |
| 0x0012              | 0~1439    | Minute     | Current time setting                       | Write only |                      |

| Hexadecimal address | Range     | Unit       | Definition                                                     | Remarks    |                                                                                             |
|---------------------|-----------|------------|----------------------------------------------------------------|------------|---------------------------------------------------------------------------------------------|
| 0x0013              | 0~1439    | Minute     | Display real time counting from the moment after 0x0012 is set | Read only  |                                                                                             |
| 0x0014              | 1200~2850 | RPM/Minute | RPM setting in timing period 1 under auto mode                 | Read-write |                                                                                             |
| 0x0015              | 1200~2850 | RPM/Minute | RPM setting in timing period 2 under auto mode                 | Read-write |                                                                                             |
| 0x0016              | 1200~2850 | RPM/Minute | RPM setting in timing period 3 under auto mode                 | Read-write |                                                                                             |
| 0x0017              | 1200~2850 | RPM/Minute | RPM setting in timing period 4 under auto mode                 | Read-write |                                                                                             |
| 0x0018              | 1~255     | /          | 485 station number                                             | Read-write | Default 200 (0xC8)                                                                          |
| 0x001a              | 0~1       | /          | ON/OFF                                                         | Read-write | 0:OFF 1:ON                                                                                  |
| 0x001b              | 1~4       | /          | Display the timing period setting conflict under auto mode     | Read only  |                                                                                             |
| 0x001c              | 1~5       | /          | Erase the timing period setting under auto mode                | Read-write | 1~4: Erase the corresponding timing period setting.<br>5: Erase all timing periods setting. |
| 0x001d              | 0~16      | /          | Error code                                                     | Read only  |                                                                                             |
| 0x001e              | /         | Watt       | Current power consumption                                      | Read only  |                                                                                             |

| Hexadecimal address | Range | Unit       | Definition                            | Remarks    |            |
|---------------------|-------|------------|---------------------------------------|------------|------------|
| 0x001f              | /     | RPM/Minute | Current RPM                           | Read only  |            |
| 0x0021              | /     | Voltage    | Input Voltage                         | Read only  |            |
| 0x0023              | /     | Hour       | Interval time of high-speed operation | Read-write | 1~6        |
| 0x0024              | /     | Minute     | Duration of high-speed operation      | Read-write | 1~5        |
| 0x0025              | /     | /          | Hardware and firmware version         | Read only  |            |
| 0x0026              | /     | Hz         | Input frequency                       | Read only  |            |
| 0x0027              | /     | Hz         | Output frequency                      | Read only  |            |
| 0x0028              | /     | Voltage    | Output voltage                        | Read only  |            |
| 0x0029              | /     | /          | High speed operation ON/OFF           | Read-write | 0:OFF 1:ON |

#### 4. Error code definition – 03 command only.

| Error code | Definition                             |
|------------|----------------------------------------|
| 0          | No error                               |
| 1          | Hardware over current or short circuit |
| 2          | Overload                               |
| 5          | Low voltage                            |
| 6          | Above maximum voltage                  |
| 8          | Above maximum temperature              |
| 11         | Communication failure                  |

## NOTES



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