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WATER CONTROL

Instruction Manual





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1. Introduction

1.1. Presentation

The purpose of this document is to detail the various functions of the Aqua Booster and Aqua Borehole Electrical Board.

The control panel is a UM21/22 console, an instrument that allows the operator to interact with the system. The operator can interact with the system at any time.

The "communication" between the operator and the installation will only be possible using this console, so a good knowledge of how to operate with it is essential.

By reading this document, the operator will be able to perform all the diagnostic and control functions allowed by this system.

Other aspects considered important will also be mentioned, which in some way allow the operator to clarify any doubts.

1.2. General Description

This electrical board has 4 inputs, with reduced voltage, for floats: Minimum Level, Alternation, Reinforcement and Alarm, with the possibility of displaying their status. Oscillatory or Fixed Alarm by user programming. Programmable time delay for Reinforcement Pump. Programmable pumps start and stop intervals. Programmable overload protection. Alarm after float failure.

Please note that there are two panel models, UM21 and UM22. Both are used in the same way, but the electrical boards differ in the range of currents that each one supports.

The UM21 panel has the following current ranges:

- 0.00 A or 00.5 A to 25.0 A in the Direct Start version;
- 0.00 A or 00.9 A to 43.0 A in the Y/Δ version.

The UM22 panel, on the other hand, has a current range:

- 0.00 A or 15.0 A to 60.0 A in the Y/Δ version.

1.3. Installation and connections

Initially you will need to unscrew the front cover of the Electrical Board, to do this the main switch needs to be OFF.

Then connect the power supply directly to the main switch.

With the main switch still off connect the motors to the corresponding terminals. Pump 1 (U1, V1, W1, N1) and Pump 2 (U2, V2, W2, N2). If Aqua Booster or Aqua Borehole, AD1 the Pump will be connected to U1, V1, W1, W2, U2, V2). For AD2 the Pump 1 will be connected on 1U1, 1V1, 1W1, 1W2, 1U2, 1V2 and Pump 2 2U1, 2V1, 2W1, 2W2, 2U2, 2V2.

With the previous processes conducted, it is necessary to connect the Levels to the terminals.



1. Introduction

For the Water Control version: Level Control (INC - Common/ INA - Presence of Water, INF - Lack of Water), Alternating Level/Main Start Order (ALT/ALT), Reinforcement Level/Reinforcement Start Order (REF/REF), Maximum Level (MAX/MAX) and "General Fault" Signalling (ALM/ALM).

1.4. Main Operation

After turning on the panel it will be necessary to make all the adjustments for a good functioning of the system (3.2).

Minimum Level Condition – The actuated minimum level signal ensures working condition.

Alternation Level – The alternation level signal, when actuated alternately switches output B1 or B2.

Reinforcement Level – The reinforcement level signal, when actuated for longer than the programmed time, the output that is available is automatically switched on.

Simultaneous Start Order – When the alternating and reinforcement levels are actuated at the same time the Pumps do not start simultaneously but take a programmable waiting interval.

Simultaneous Stop Order – Whenever two outputs are on and a stop command is given, they do not switch off at the same time, but wait for a programmable delay time.

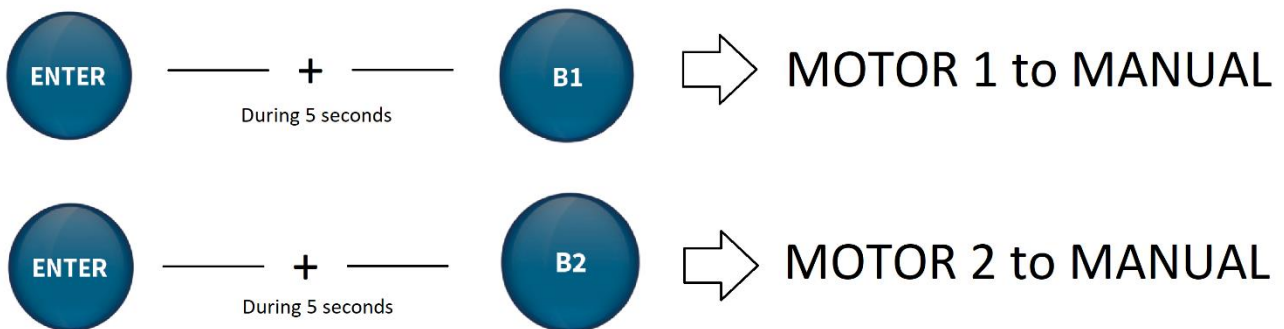
Thermal Trip, Alarm and Automatic Pump Switching – On receiving the order to start the Pump, the Relay operates for 5 seconds to check that the motor consumption value is within the set parameters. If it is correct, the relay remains actuated. Whenever the programmed value for thermal protection is exceeded in a time superior to 5 seconds the relay turns off and signals thermal trip, turning on immediately the second Pump.

Start-up Attempts – When a thermal trip occurs the pump output turns off for 60 seconds, after that it turns on again automatically and two situations may occur. Either the fault has disappeared, and the relay actuates, or the fault remains, and the relay switches off, initiating the 2nd attempt for a further 60 seconds. The alarm sounds only at the end of the 2nd attempt if the relay is deactivated. The manual reset of the thermal is executed by manually turning the respective Pump off and on again.

The console allows the user to operate in two operating modes.

2.1. Manual Mode

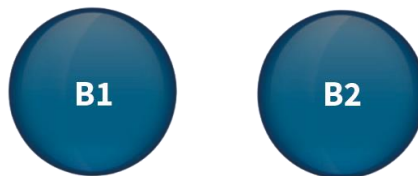
This mode can be selected through the control panel using the button combination shown below, where the operator can turn the Pumps on and off individually. In this mode the user needs to monitor the process, as the only shutdown command is motor failure.



2.2. Automatic Mode

This mode, like the previous one, can be selected from the control panel using the button associated with the pump you want to work with, and in this mode the pumps start and stop automatically and sequentially. In this operating mode, in addition to the protection - stop by failure -, the stop through the safeties and floats is also available.

Each push of the button will toggle between Automatic Mode and Pump OFF Mode.





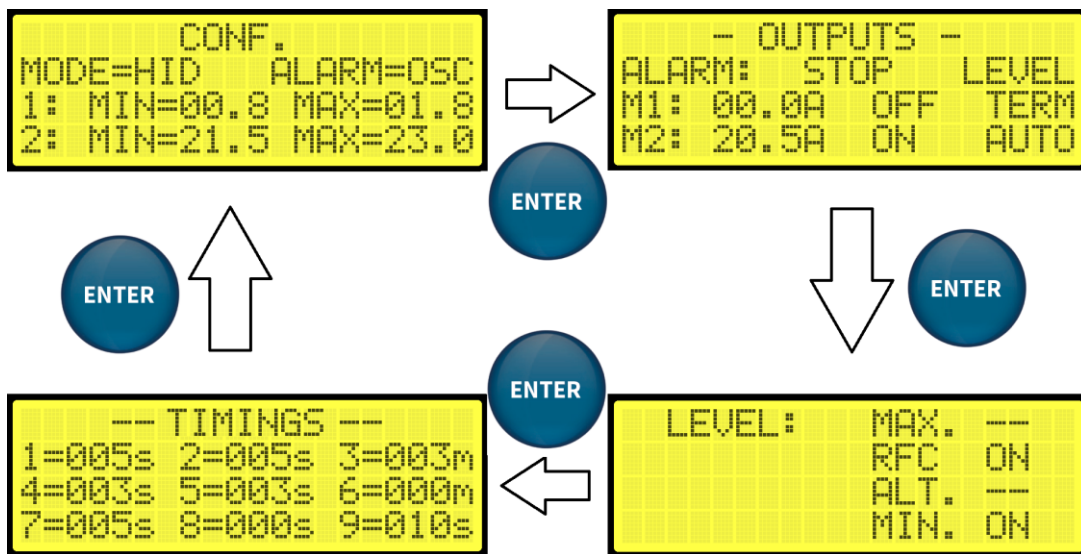
3. Panel Operation

There are also two modes of using the panel, Display Mode and Programming Mode.

3.1. View Mode

In view mode, the user can check and control the entire system, from start-up and shutdown to alarm monitoring.

To navigate between Display Mode screens, press the ENTER key, each pulse will move to the next screen, as shown in the figure below.

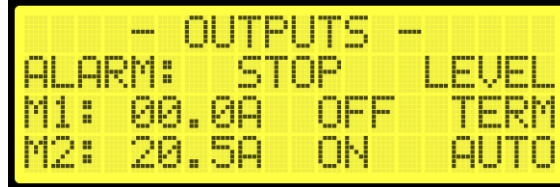


3.1.1. General Settings

```
CONF.  
MODE=HID ALARM=OSC  
1: MIN=0.08 MAX=01.8  
2: MIN=21.5 MAX=23.0
```

- Function “**MODE**”: “**HID**” = Hydropressor;
- “**ALARM**” Type: “**OSC**” = Oscillatory and “**FIX**” = Fixed;
- “**X:**” = Line referring to Motor X;
 - “**MIN**” = Minimum Current in Amperes;
 - “**MAX**” = Maximum current in Amperes.

3.1.2. Output Readings



```
- OUTPUTS -  
ALARM:  STOP  LEVEL  
M1: 00.0A  OFF  TERM  
M2: 20.5A  ON  AUTO
```

- “ALARM:”:
 - Alarm State;
 - “OFF” = No beep and panel backlighting depends on clock;
 - “ON” = (Oscillating or Fixed) - Has buzzer and panel backlight flashes;
 - “STOP” = Forced to Stop - No beep and dashboard backlight flashes;
 - “LEVEL” – This field is displayed whenever the alarm is triggered by the maximum level float or by level loss;
- “MX:” = Line referring to Motor X;
 - “cc.cA” = Motor current in Amperes (between 0.00A to 25.00A);
 - Motor State:
 - “OFF” = Motor Stopped;
 - “ON” = Motor Running;
 - Motor Function Mode:
 - “MAN” = Motor in Manual Mode;
 - “AUTO” = Motor in Automatic Mode;
 - “STOP” = Motor Disabled;
 - Faulty Motor:
 - “DIM” = Minimum Current Tripping (but above 0.5A)
 - “NMOT” = Thermal Tripping (No Motor – Current Value below 0.5 A);
 - “TERM” = Thermal Tripping (Current above Maximum Current).

3.1.3. Level States

```

LEVEL:    MAX.  --
          RFC  ON
          ALT. --
          MIN. ON
  
```

- “MAX” = Maximum Float Level;
- “RFC” = Reinforcement Float Level;
- “ALT.” = Alternance Float Level;
- “MIN.” = Minimum Float Level;
- Level States:
 - “--” = Water not Detected;
 - “ON” = Water Detected.

3.1.4. Timers

```

-- TIMINGS --
1=005s 2=005s 3=003m
4=003s 5=003s 6=000m
7=005s 8=000s 9=010s
  
```

- Timings:
 - **Time 1** = Delay time for starting Motor 1 – **5 to 250 seconds**;
 - **Time 2** = Delay time for starting Motor 2 – **5 to 250 seconds**;
 - **Time 3** = Start delay time after "DIM" – **1 to 60 seconds**;
 - **Time 4** = Next motor stop gap – **3 to 60 seconds**;
 - **Time 5** = Second motor stop gap – **3 to 60 seconds**;
 - **Time 6** = Minimum motor running time – **0 to 5 minutes**
 - **Time 7** = Delayed stop time after water shortage – **5 to 15 seconds**;
 - **Time 8** = Start delay time after water detection – **0 to 250 seconds**;
 - **Time 9** = Waiting time for lack water alarm – **10 to 15 minutes**.



3. Panel Operation

3.2. Programming Mode

In programming mode, the user can program the entire system, operating mode, alarms and start times.

To enter Programming Mode, press the ENTER key and the alarm silence key for approximately 3 seconds.

To exit go through a menu to make sure the values are stored and repeat the input combination.



If a key has been configured when entering programming mode, it will be requested from the user.



On this screen to enter the key you need to move the symbol “█” so that it is just below the field you want to change.

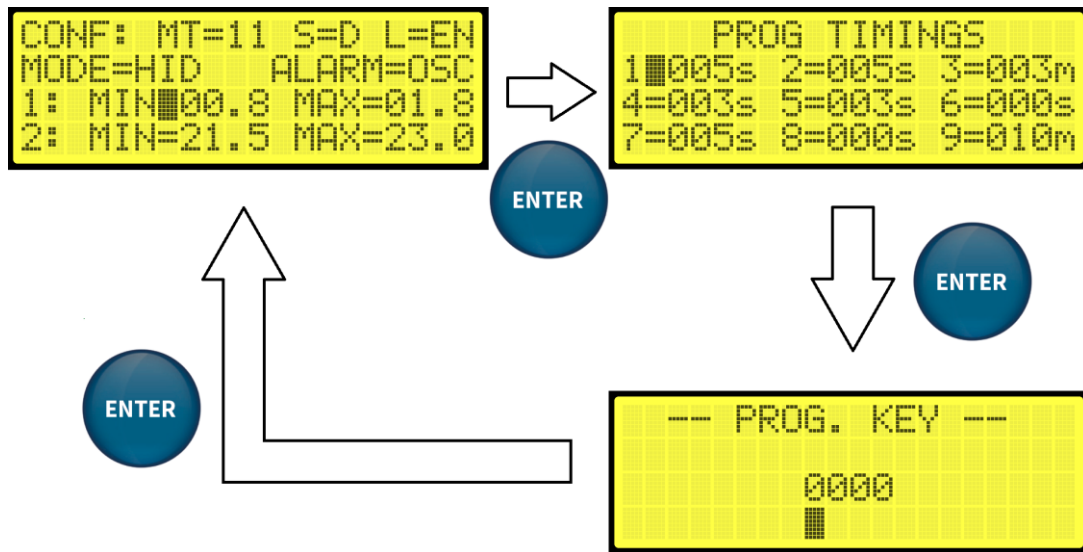
Each of the digits must be between 0 and 9.


If no password is set, this menu is not displayed.



3. Panel Operation

In Programming Mode, navigation is done in the same way as in View mode.



To navigate through each menu in this way, you need to use the right arrow key to move the symbol “”, so that you can adjust the value immediately to the right of the symbol. To adjust the value, it is only necessary to use the up and down arrows to modify the value of the field.



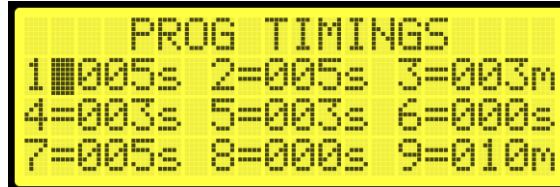
Any parameter in programming mode should only be changed by a qualified technician.

3.2.1. Programming Settings

```
CONF: MT=11 S=D L=EN
MODE=HID ALARM=OSC
1: MIN=00.8 MAX=01.8
2: MIN=21.5 MAX=23.0
```

- “**MT**” = Presence of Motors;
 - “**10**” = Only Motor 1 present;
 - “**01**” = Only Motor 2 present;
 - “**11**” = Both Motors present (Default Value);
 - Attention: If MT=10 or MT=01 there will be no alternation;
- “**S**” = Start Type;
 - “**D**” = Direct Start (Default Value);
 - “**Y**” = Star – Delta Start;
- “**L**” = Language;
 - “**PT**” = Portuguese (Default Value);
 - “**EN**” = English;
- “**ALARM**” Type;
 - “**OSC**” = Oscillatory (Default Value);
 - “**FIX**” = Fixed;
- “**X:**” = Line referring to Motor X;
 - “**MIN**” = Minimum Current in Amperes (Default Value = 0A);
 - “**MAX**” = Maximum Current in Amperes (Default Value = 25A).

3.2.2. Programming Timers



PROG TIMINGS		
1=005s	2=005s	3=003m
4=003s	5=003s	6=000s
7=005s	8=000s	9=010m

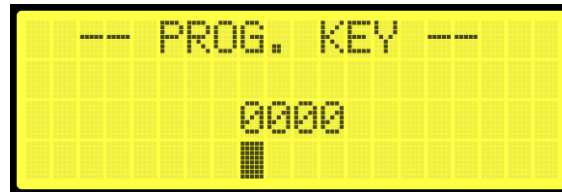
The figure above shows the Default Times.


- Timings:
 - **Time 1** = Delay time for starting Motor 1 – **5 to 250 seconds**;
 - **Time 2** = Delay time for starting Motor 2 – **5 to 250 seconds**;
 - **Time 3** = Start delay time after "DIM" – **1 to 60 seconds**;
 - **Time 4** = Next motor stop gap – **3 to 60 seconds**;
 - **Time 5** = Second motor stop gap – **3 to 60 seconds**;
 - **Time 6** = Minimum motor running time – **0 to 5 minutes**
 - **Time 7** = Delayed stop time after water shortage – **5 to 15 seconds**;
 - **Time 8** = Start delay time after water detection – **0 to 250 seconds**;
 - **Time 9** = Waiting time for lack water alarm – **10 to 15 minutes**.



3. Panel Operation

3.2.3. Programming Password



In this menu to change the key you need to move the symbol “” so that it is directly below the field you want to change.

Each digit must be between 0 and 9.

When the key is "0000" (Default Value), it is not required.

3.2.4. Reset to Factory Settings

To reset the parameters to factory settings it is necessary to disconnect the power from the panel and when reconnecting hold the ENTER button for approximately 5 seconds.

3.3. Suggested Program

Suggested WATER CONTROL program (FACTORY VALUE)

