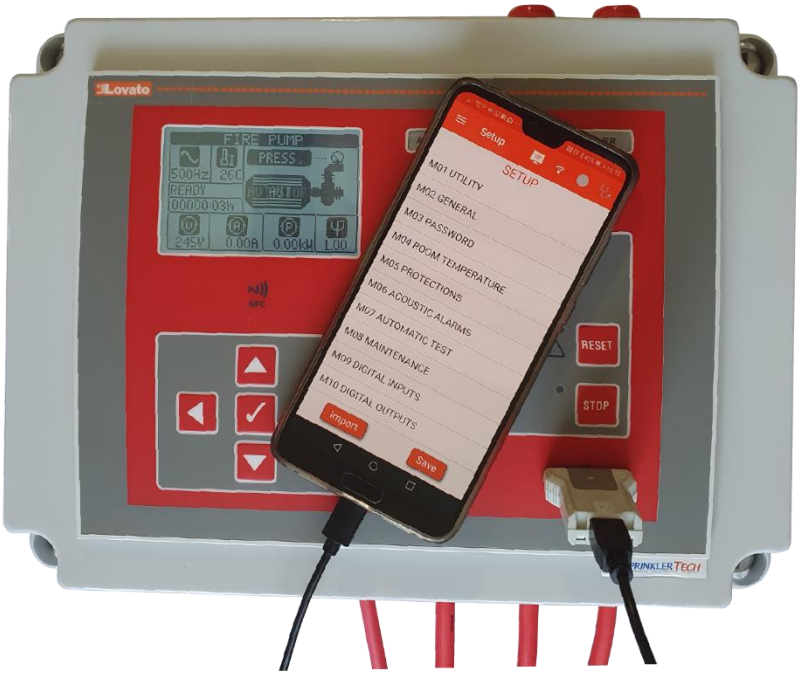

AquaGuard BS9251 Fire Pump Controller
User & Installation Manual

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If additional assistance or information is required, please contact AquaGuard Pumps Technical on 0800 040 7738.

1. Product Description

The AquaGuard fire pump controller has been designed as an easy to install, all in one solution to control the operation, monitoring and automatic testing of the fire pump in accordance with BS9251:2014.

Incorporating an informative LCD display and optional Mobile App to assist programming and view/save event logs making the AquaGuard fire pump controller the most advanced on the market.

Features

Jockey Mode - Upon pressure loss the pump will operate, if no flow is detected then pump will shut off after 2 minutes.

Fire Mode - If pressure loss and flow are detected pump will operate in fire mode until manually shut down.

Test Mode – Each Monday at 10am the controller will open the solenoid valve until the pressure switch is activated and run the pump checking voltage/current and power are within set parameters. Current check only version will test at the same time running the pump checking voltage/current and power are within set parameters.

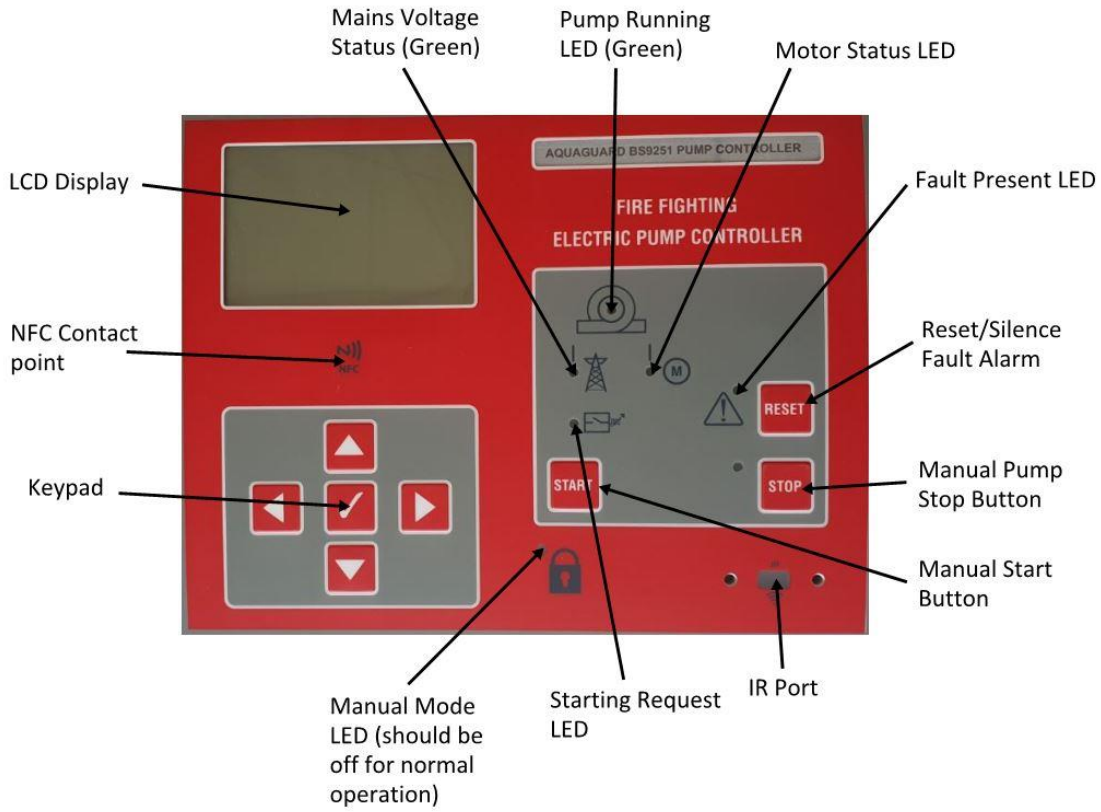
Maintenance - Maintenance interval is pre-set to every 12 Months but can be adjusted to suit specific interval requirements. Maintenance due indicator will require a physical flow test to reset.

Event Log - Event log up to 128 entries can be accessed on the control panel or downloaded from the Mobile App via the IR dongle*.

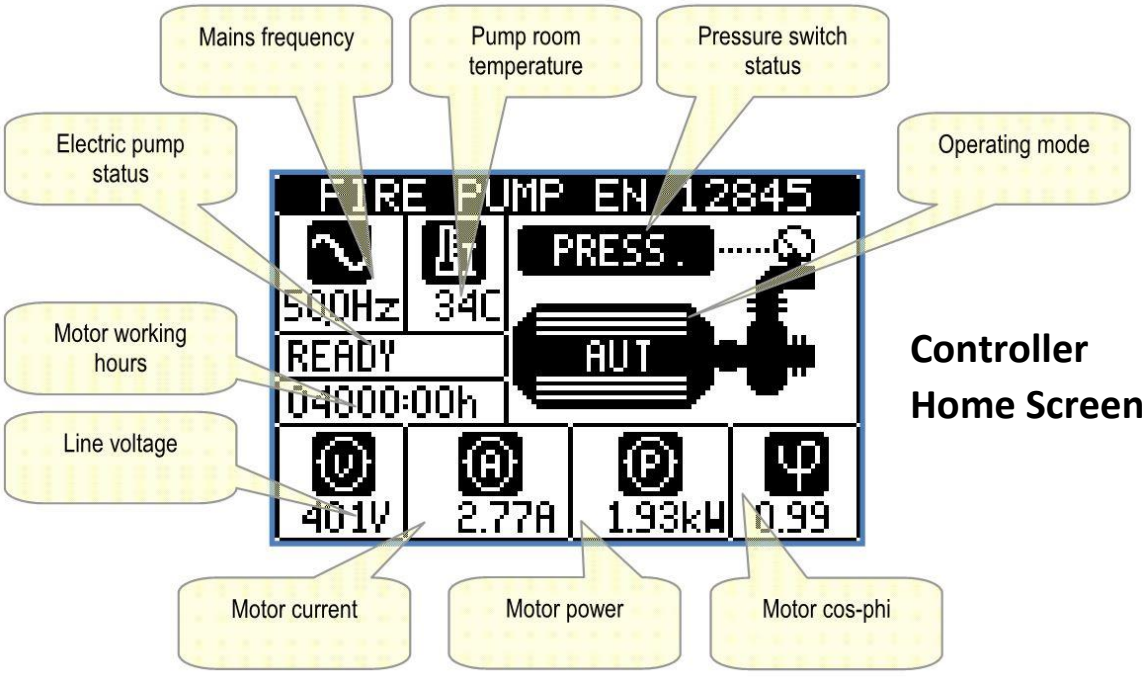
Setup Mode - All settings can be changed if required with the use of an advanced user password to prevent unauthorised access to settings.

2. User Interface

2.1 – AquaGuard fire pump controller button and LED description.



2.2 – AquaGuard fire pump controller LCD Display 'Home Screen' description.



3. Installation Guide

General

3.1 - This product must be installed by a suitably qualified electrician.

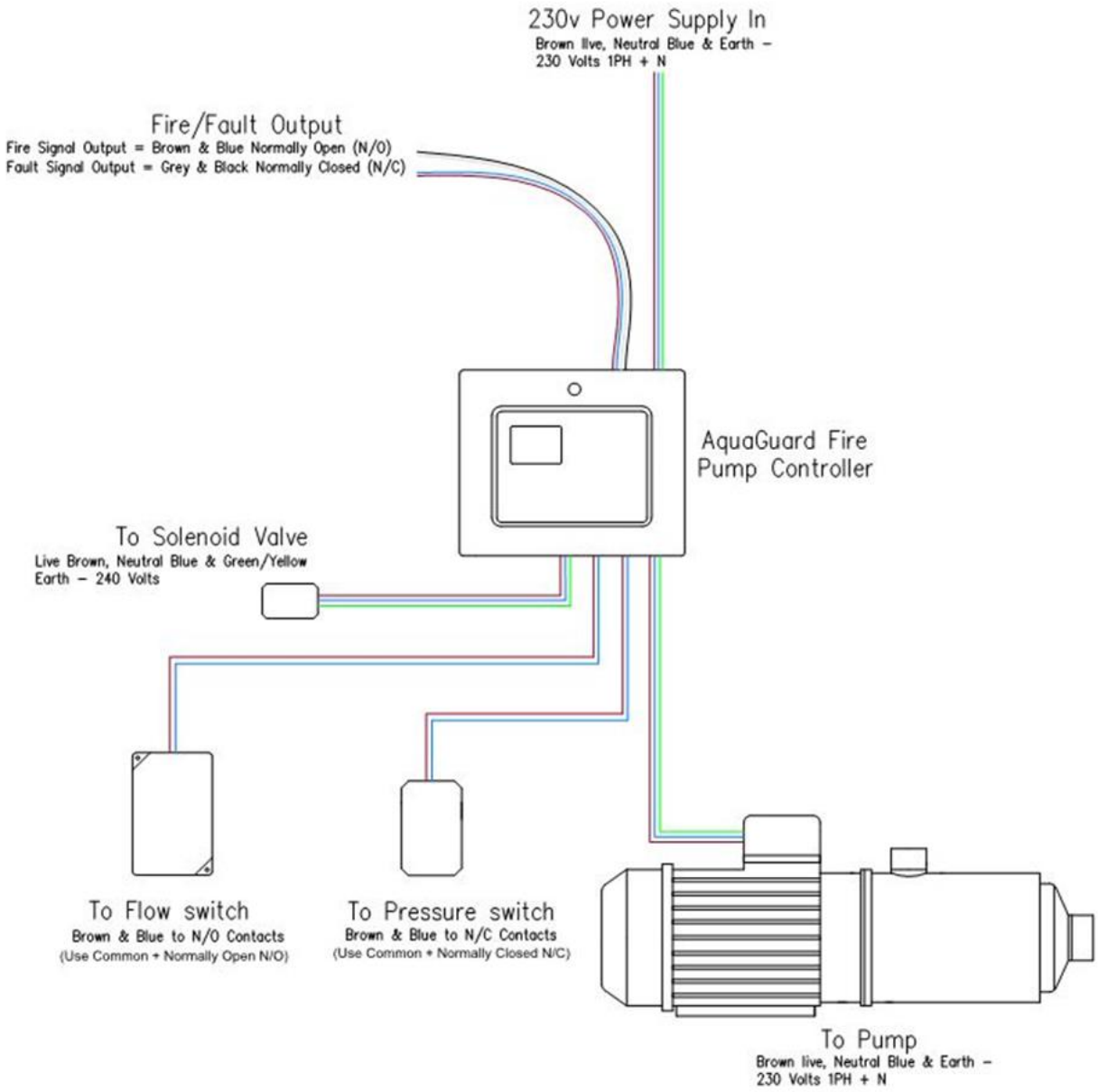
3.2 - This controller must be earthed.

3.3 – This controller should be wired to a suitable isolator, fed directly from the electrical distribution board protected by a dedicated RCD/RCBO suitably sized for the fire pump installed.

Installation

3.4 – AquaGuard Fire Pump Controller must be connected as per diagram below. The current check only version will not have the solenoid cable present. Take care with solenoid connection as 230v will be present to solenoid when requested.

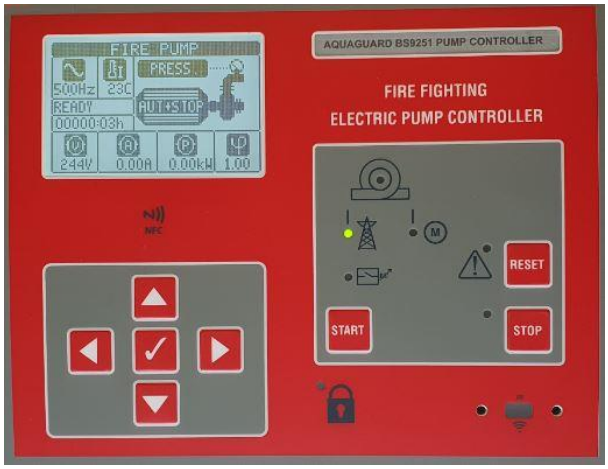
Fig.1



4. Controller Set Up

4.1 – Once controller has been wired as per diagram (Fig.1) the controller power supply can be switched on, please note that on initial power up the pump will run to reach system pressure, please ensure that all suction valves are open and pump has been fully primed and free of any air before switching on for the first time.

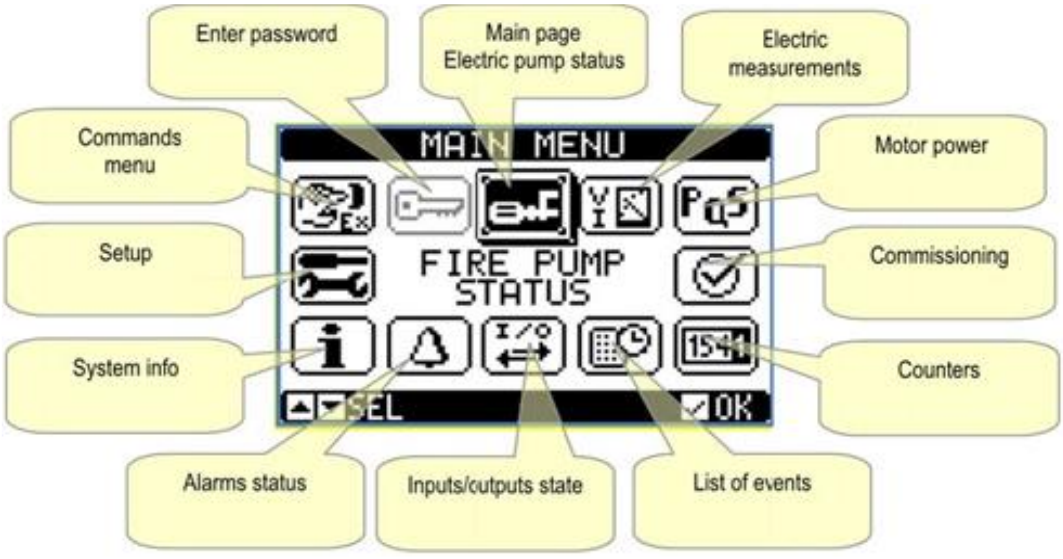
4.2 – Shortly after switching the controller on for the first time, once system pressure (Pmax) has been made the controller will start a 2 minute countdown indicating 'Jockey Mode' press the 'Stop' button and the home screen and green power led should be visible as image below. If the 'Sprinkler activated' is displayed press the 'Reset' button to reset.



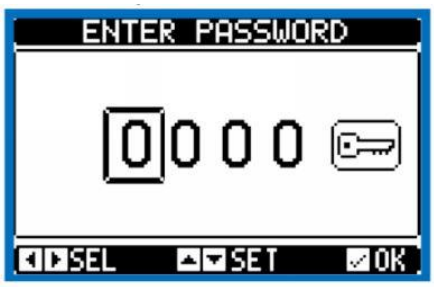
If pump current/power differs from the pre-set current/power of **5 amps** and **1.1KW** then the installed pump current will need to be entered into the controller following the steps below.

4.3 – **Setting Pump Current and Power**

1. To set the pump current and power, press the ok (tick) button to enter 'Main Menu'.



2. Navigate to ‘Enter Password’ (key icon), enter code 2000, press right to key symbol then press ok (tick).



3. Enter main menu, navigate to ‘Setup’. To enter setup you must first hold the ‘Manual Mode’ button located on the underside of the controller (Fig 4) and press ok on the keypad (once into setup the manual mode button can be released).

4. Once in ’Setup’, go to ‘M02 General’, navigate down to ‘Nominal Current’ press ok. Using the left and right arrows adjust the current to match the pump current indicated on the pump data plate. Once entered press ok.

5. Press the ‘Stop’ button to navigate back to ‘M02 General’ then navigate down to ‘Nominal Power’ press ok. Using the left and right arrows adjust the power (KW) to match the pump power (KW) indicated on the pump data plate. Once entered press ok. Then press the ‘Stop’ button three times to exit to home screen this will prompt a system reset to update values entered.

Warning: All controllers are pre-programed and tested to comply with BS9251, only change the current and power parameters to suit installed pump, changes to any other parameters may prevent the controller from operating correctly and will invalidate the warranty.

4.4 – **Setting Time and Date**

From the home screen display, press the up key until the time and date are visible on display, then press the left and right keys at the same time to edit. Use the up, down, left, right keys to set time and date then press ok (tick) button to set. Press the down key until the home screen is displayed. Note: date is in the format of MM/DD/YYYY.

5. Commissioning

5.1 – **Filling the system**

If the sprinkler system was not filled upon initial power up in step 4.1, please proceed to filling the system, this may activate the alarm output therefore it may be required to temporarily isolate the alarm. Once system pressure (Pmax) has been made the controller will start a 2 minute countdown indicating 'Jockey Mode' press the 'Stop' button and the home screen and green power led should be visible as image below. If the 'Sprinkler activated' is displayed press the 'Reset' button to reset.

5.2 – **Setting of Pressure Switch**

The installed pressure switch may need adjusting from factory default settings, it is recommended that the system pressure switch be set approximately 0.5 bar above pressure required in the 'most unfavourable hydraulic calculations'. Refer to pressure switch instruction manual for setting instructions, this should be undertaken with the Aquaguard pump controller switched off.

5.2 – **Flow Test**

From the pump test valve a flow test should be undertaken to check pump satisfies the flow and pressure requirements set out in the system Hydraulic Calculations, after 15 seconds of the system flowing the 'Sprinkler Activated' will appear triggering the alarm output. Once flow test has been completed and system repressurised press the 'Stop' button then 'Reset' button to return to home screen.

5.3 – **Weekly Test**

To force a weekly test to ensure correct operation of solenoid etc, using the instructions set out in '4.4 – Setting Time and Date' adjust the time to a Monday at 09.58, press ok, then press the down key until the home screen is displayed.

Within two minutes the weekly test will start, opening the solenoid valve until the pressure switch is activated and run the pump for 60 seconds checking voltage/current and power are within set parameters. Current check only version will run the pump for 60 seconds checking voltage/current and power are within set parameters.

Once test is completed, repeat the steps in 4.4 to reset to correct time and date.

6. Annual Maintenance

6.1 – **Annual Maintenance Reset**

12 Months from system commissioning the ‘Maintenance 1 Requested’ fault will be displayed; this will not trigger the fault output unless requested. This maintenance fault can only be reset by undertaking an annual flow test.

To reset annual maintenance undertake the following procedure.

1. Undertake a flow test as per section 5.2, please note if flow detected for more than 15 seconds the alarm output will be triggered. Once finished press the ‘Stop’ button followed by the ‘Reset’ button.

2. Following the same password and button entry procedure in section 4.3, enter main menu, navigate to the ‘Enter password’ section, enter code ‘2000’ then press ok on the key symbol.

3. Enter main menu, navigate to the ‘Commands’ menu, while holding the ‘Manual mode’ button press ok.

4. Once in ‘Commands’ menu, navigate down to ‘C01 Reset Maintenance Interval 1’ press ok to execute it, the device will prompt for a confirmation, press ok again, this will reset the maintenance to a further 12 months. Press the ‘Stop’ button several times to exit to home screen.

6.2 – **Event Log**

The Aquaguard controller has a 128 entry event log incorporated, this indicates in detail with a date and time every event that has occurred. To view, from the controller home screen press the up key until the ‘Event Log’ screen is displayed, then use the left and right keys to navigate through the log.

7. NFC Connectivity

The Aquaguard fire pump controller has incorporated NFC mobile connectivity. This allows the user to easily change parameters and download the event log via an app (Only available on Android devices). To use this feature, complete the following.

1. Go to the Google 'Play Store' and download the 'Lovato NFC' app. Ensure NFC is activated in your device settings.

2. Once downloaded, open the app and select 'Download Driver', once complete will display 'Driver downloaded successfully'.

3. Hold the mobile device to the NFC symbol on the Aquaguard controller, may have to move phone around slightly to achieve a connection. The NFC works when the controller is off, if the controller is powered on then the 'Manual mode' button must be pressed when connecting.

4. Once connected, you will be prompted to input the advanced user passcode which is 2000.

5. Once connected, navigate the menu to change the current/power parameters, reset maintenance or view event logs.

6. To execute a current/power parameter change or command follow the on screen prompt to place mobile device against the NFC symbol on the controller, as above if powered on the 'Manual mode' button must be pressed when connecting. The mobile device will state a successful upload and the controller will reset.

Warning: All controllers are pre-programed and tested to comply with BS9251, only change the current and power parameters to suit installed pump, changes to any other parameters may prevent the controller from operating correctly and will invalidate the warranty.

8. Fault Alarm Table

If any faults are present on the controller then these will be displayed on the LCD display with a code A01 – A38, see alarm table below for description.

COD	DESCRIPTION	ALARM EXPLANATION
A01	Low mains voltage	Mains voltage lower than the threshold set in P05.01.
A02	High mains voltage	Mains voltage higher than the threshold set in P05.02.
A03	Low mains frequency	Mains frequency lower than the threshold set in P05.03.
A04	High mains frequency	Mains frequency higher than the threshold set in P05.04.
A05	Voltage asymmetry mains	Mains voltage asymmetry higher than the threshold set in P05.05.
A06	Phase failure	Missing of one of the phases.
A07	Incorrect phase sequence	The phase sequence is not correct.
A08	Pump starting failure	Either the electrical parameters did not enter the limits and/or delays defined in menu M05 or the programmable input with function *Pump pressure switch* did not activate.
A09	Locked rotor	Motor current higher than 500% of rated In for a time longer than 5s.
A10	Dry running	Pump dry running. The measured power factor is lower than the threshold set in P05.13.
A11	Current too low	Motor current lower than the threshold set in P05.06
A12	Current too high	Motor current higher than the threshold set in P05.07
A13	Unbalanced current	The current asymmetry has exceeded the threshold set in P05.14.
A14	Unexpected current	The system detects a current higher than 5% of rated current In even if there is no command to run the motor.
A15	Wrong CT connection	One or more current transformers (CT) are not connected in the correct way (system measures negative active power). Check the connections at terminals 57, 58, 59, 60.
A16	System error	Internal error. Please contact Lovato Electric Technical Support (tel. 035 4282422; e-mail: service@LovatoElectric.com).
A17	Low temperature in pump room	The room temperature is lower than the threshold set in P04.02 for a time longer than P04.03.
A18	High temperature in pump room	The room temperature is higher than the threshold set in P04.04 for a time longer than P04.05.
A19	Water reserve	Alarm generated by the input programmed with the *Water supply* function
A20	Low water tank level	Water level in the tank lower than the threshold set in P02.18.
A21	Water tank empty	Water level in the tank lower than the threshold set in P02.19.
A22	Low level priming tank	The programmable input with function *Priming tank level* is active
A23	System is not in automatic mode	System not in automatic mode for more than 24 hours
A24	Fire pump running	Alarm generated by the input programmed with the 'Pressure switch start' function.
A25	Fire pump not in pressure	Alarm generated by the programmed input with the function *Pump pressure switch* not active after 1min with motor running.
A26	Pump in pressure	Alarm generated by the programmed input with the function *Pump pressure switch* active for 1 minute without motor running.
A27	Maintenance 1 requested	Alarm generated when the maintenance intervals of its
A28	Maintenance 2 requested	range reach zero. See menu M08. Use the command menu
A29	Maintenance 3 requested	to reset the hours and reset the alarm.
A30	Suction valve partially opened	Alarm generated by the programmed input with the function 'Suction valve partially open', in this situation the suction valve is not capable of delivering the maximum flow rate of water needed to the pump.
A31	Discharge valve partially opened	Alarm generated by the programmed input with the function 'Delivery valve partially open', in this situation the delivery valve is not capable of delivering the maximum flow rate of water needed to the sprinkler system.
A32	Sprinkler in pump room activated	Alarm generated by the programmed input with the function '*Sprinkler activated*'
A33	Max number of start-up jockey pump	Alarm generated when the threshold set to parameter P02.20 is exceeded and if there is a programmed input with the function '*Jockey pump activated*'.
A34	Jockey pump alarm failure	Alarm generated by the programmed input with the function '*Jockey pump failure*'.
A35	Timeout jockey pump	Alarm generated when the threshold set to parameter P02.21 is exceeded and if there is a programmed input with the function '*Jockey pump activated*'.
A36	Drainage pump alarm failure	Alarm generated by the programmed input with the function '*Drainage pump failure*'.
A37	Communication error	RS-485 communication among different FFL... is not working properly. Check wiring and communication settings in M11 menu.
A38	Pressure input test failed	During automatic test (in ON-OUT mode) the pressure switch remains closed for more than 1 minute.
UA1 ... UA8	User alarms	The user alarm is generated by enabling the variable or associated input in menu M18.

9. Troubleshooting

Issue	Possible Cause	Action
Controller not powering on	Power supply to controller not on or wired incorrectly.	Check all connections, fuses and MCB/RCBO.
Controller powers on, then goes off when pump start requested.	Pump wired incorrectly Fuse or MCB/RCBO not sized correctly for pump.	Check pump motor wiring Replace fuse, MCB/RCBO for an adequately sized C rated type.
Pump running not pressurising system	Suction/delivery valves closed Pump not primed	Check all suction and delivery valves are open. Open all pump bleed screws until water flows freely.
Pump not generating design flow/pressure	Pump not adequately primed Obstruction in suction or delivery pipe work. Suction pipe diameter too small or pipe run too long	Open all pump bleed screws until water flows freely. Check pipe work and clear if necessary. Pump suction must never be smaller than pump inlet diameter. If long suction pipe run then increased pipe size should be used.
Pump not running when pressure low or at zero	Pressure switch not wired correctly Pressure switch cable wired to flow switch	Wire pressure switch between COM and NC (normally closed) Wire pressure switch cable to pressure switch as above.
230v Solenoid valve fails to operate on weekly test followed by voltage fault on controller	Incorrect wiring to solenoid	Check wiring – may have blown 1.6A fast blow fuse in controller, replace if necessary.
External Fire Panel in fault when pump controller displays no fault on the LCD Display.	Incorrect wiring of fault output Pump controller switched off	Fault output must be wired normally closed (NC) Turn pump controller on
Faults - A11 Current too low, A12 Current too high, Power too high, Power too low.	Correct pump current and power not input correctly Possible pump fault	Follow the steps in section 4.3. Check current/power reading if vastly different to pump data plate call pump manufacturer.
Fault present on pump controller	Refer to fault alarm table in section 8 to identify fault and possible action required.	Undertaken action if possible. Call Aquaguard if problem persists.

If the controller is suspected to be faulty call Aquaguard on 0800 040 7738 for advice.