

AQUA SENTRY

Operating Manual

Bund Water Control Type 025-G

Installation, Operation & Maintenance

with (Optional) Extra Feature - GSM Text Messaging Capability



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General Function

The 025 G, is designed to remove rainwater from bunded areas; this enables the designed capacity of the bund to remain uncompromised so meaning the capacity of the bund is always maintained for the event that it is protecting against ie Leaking Tank, or Leaking pipes Containing Hydrocarbons.

Equipment

The Bund Water Control is normally supplied together with one probe unit (Code: 031), and One Submersible Pump, special base plate kit, discharge hose, plus an anti-siphon device.

Please Note The unit is capable of controlling two pumps within the same sump Or Pump Chamber, it controls the pumps using a switching circuit, each pump to work at 50% duty cycle. (Each Pump In Turn Will Pump For One Full Start/Stop Cycle)it can also ask the second pump to assist (Join in the effort) if the first pump is not coping)

GSM Capability (optional) EXTRA

Simply PLUG In the Modem We supply , and INSERT the SIM CARD into the modems SIM holder, power up the unit again and follow the set up instructions.

This optional GSM capability allows text messages to be sent to up to 8 mobile phone numbers when a high oil or high water condition occurs. Removing the COST to hard wire alarm cables in a scheme

The Interactive “AquaSentry DeadStop”

This unique facility offers a fail-safe circuit for the pump, thus preventing the possibility of inadvertent oil removal due to any possible mis-operation or circuit failure. It utilises the fourth (red) Probe, within the Probe Unit, to constantly monitor for water presence above the pump inlet. Should this circuit detect the NON-PRESENCE of water in this area it will automatically prevent power being applied to the pump. The LCD display indicates the operation of this DEADSTOP facility.

Alarm Facilities (Outputs)

Alarms are displayed by means of messages on the LCD screen; the circuit operates an array of 'clean contact' relays for output connection to remote alarms or telemetry systems.

The alarm relay outputs are as follows:

Power Failure

High Oil

High Water/Pump Failure

Two further outputs are available if required, high Level and Pump Called.

USER Optional PUMP shut-off

This user configurable option will automatically disable the pump should a high oil condition arise. However, it will automatically re-enable the pump should the condition reset.

Non-polarising pump control circuit (Prevents probe oxidation.)

Ultra Low voltage Alternating signal is supplied to the Pump start probe/s and DeadStop probe. This prevents the probe/s polarising due to any electrolysis action that may occur over a period and helps prevent any debris build up on the probe tips due to this.

In-built push button test for pump/s.

A push button switch is fitted as standard on the PCB for test and maintenance use to momentarily operate the pump relay, enabling the user to verify the Control circuit operation without the necessity of filling the sump with water etc.

Digital Operation Counter

A pump operation count is displayed on the LCDscreen within the control unit to log the number of pump cycles. The count can be reset by the user.

ISOLATOR fitted as standard (RCBO can be fitted instead if requested)

A Mains isolator is fitted within the control offering local isolation of the control for maintenance / repair purposes.

EasyaccessPump Fuse

A pump fuse is incorporated in the terminal output for ease of access.

Probe Unit and Pump Base Kit

Ease of Installation (All Units)

The Probe/base kit requires no fixings and can simply be lowered into the sump. The unit also incorporates a probe bracket stand with locating brackets for the pump. This base plate keeps the pump above the sump floor, helping prevent small stones, grit etc. from entering the pump inlet and automatically places the pump in the correct position in relation to the probe set.

Deep Sump, Shallow Sump, No Sump or Dump Tank Operation (code 031)

Each probe sensor is colour coded and can be cut/set to the correct length to suit sump/site requirements. Because the Probe Unit is attached to the Pump Stand, the datum point for the probe heights can be taken from the Pump Inlet. This allows for accurate control of the water level where only a small Start/Stop range is possible.

Anti-Siphon Device

An in-line anti-siphon device is supplied with each Main Kit and MUST be fitted to the discharge hose 6" inches or 150mm at a point from the top of the inner bund wall; this is done to prevent inadvertent siphoning of oil after a major spillage.

Installation

- a) To prevent damage to the circuit board the backing plate containing the PCB and DIN Rail connectors should be removed as a complete assembly from control cabinet before any drilling is undertaken for cable entry points. This can be achieved by simply removing the 4 retaining nuts and washers.
- b) Determine the number and size of the cable entry points and the gland types and sizes required for this installation and using the template provided, carefully drill the base of the enclosure.
- c) Clean out the enclosure before replacing backing plate etc. and securing it with the 4 nuts and washers previously removed.
- d) If the unit is to be installed on a Unibund, fit the hanging brackets to the rear of the enclosure.
- e) The Control Unit should be mounted on the outside surface of the bund wall, within 5 metres of the sump. (Note: A 10 metre length of cable is attached and sealed as standard, to the pump and probe. If a longer length is required, then this must be specified at the time of order). Mains (230 VAC), Pump, Probe and Telemetry cables should be fed into the unit via the entry points previously drilled using the appropriate cable glands. Connection to the terminals within the control is listed in Table 1, Table 2 and Table 3.
- f) The probe sensors within the Probe Unit should be cut to the required length. Each sensor is colour coded for your convenience

– SEE DRAWING at the end of this Manual

BLACK = Common.

YELLOW = Pump Start

BLUE = Pump Stop

RED = DeadStop

(Note: The colours of the sensors correspond to the colours of the signal wires exiting the Probe Unit).

After cutting the probes the insulation shroud should then be cut back, approximately 20mm, to expose the end of each probe. The Probe Unit can then be positioned with the Pump secured via the clamping bracket, which is fastened around the outlet of the pump, The hose tail, hose, antisiphon device and lifting chain/rope should be connected before lowering the completed unit into the sump. Note: The anti-siphon device must be connected into the hose in order that its position is approximately 6 inches (150mm) below the top of the inner side of the bund wall. The hose should then be fed over the wall to an appropriate drain or soak-away. The lifting chain/rope should be anchored in an accessible position for easy retrieval should the pump and probe unit need to be removed at a later date for maintenance or repair. The pump and probe cables should then be fed back to the control unit.

Probe Inputs

Table 1- Probe inputs details (CN6)

Terminal Label	Probe Set 1 Only	Probe Sets 1 & 2 (Probe 2 Enabled)
COM		Black (Probe set No 2)
COM	Green	Green (probe set No 2)
FLOAT SW	White	White (probe set No2)
DEADSTOP	Red	Red (probe set 1)
STOP	Blue	Blue (probe set 1)
START 1	Yellow	Yellow (probe set 1)
START 2		Yellow (probe set No2)
COM	Black	Black (Probe set 1)

Outputs

Table 2- Outputs details (CN9, 11 -16)

Output	Description	Type	Conditions
CN9, P1L	Pump 1 mains live	Relay, mains	<p>Activated under any of the following conditions (assuming no alarm conditions exist):</p> <ul style="list-style-type: none"> • When water level is above start probe 1. When the second pump is enabled in setup, use is alternated with P2L and hence pump 2. • When there is a high liquid level and this output is the assist pump when the second pump is enabled in setup. • De-activated when water level drops below stop probe. • De-activated when the deadstop probe no longer detects water. • De-activated by a high liquid level, oil or water, if set in the setup menu
CN9, P2L	Pump 1 mains live	Relay, mains	<p>Activated under any of the following conditions (assuming no alarm conditions exist):</p> <ul style="list-style-type: none"> • When the second pump is enabled in setup and the water level is above start probe 1. Use is alternated with P1L and hence pump 1. • When there is a high liquid level and this output is the assist pump. • De-activated when water level drops below stop probe. • De-activated when the deadstop probe no longer detects water. • De-activated by a high liquid level, oil or water, if set in the setup menu.

Table 2- Outputs details (CN9, 11 -16), continued

Output	Description	Type	Conditions
CN11	Beacon	Switched 12V	Activated by a high oil, high water or deadstop alarm.
CN12	High level alarm	Switched 12V	Activated when there is a high oil or high water alarm.
CN13	Pump called	Switched 12V	Activated when one or both pumps outputs are activated.
CN14	Power fail alarm	Relay, volt-free	Energised whilst power is present to the unit.
CN15	Oil alarm	Relay, volt-free	Energised when the high level float switch is activated and oil is detected on the relevant start probe (after a 5 second delay to prevent false triggering).
CN16	Water alarm	Relay, volt-free	Energised when the high level float switch is activated and water is detected on the relevant start probe and the user configurable delay time has passed.

MAINS SUPPLY(Switch Mode Transformer Type)

(Auto Detects 240v AC or 110v AC)

The mains input supply voltage is automatically detected, **PLEASE ENSURE THE PUMP SUPPLIED IS OF THE SAME VOLTAGE, AS THAT OF THE SUPPLY to the UNIT.** Connection details are shown in Table 3.

The pump relay outputs, P1L and P2L, on CN9 are intended for a total combined current of up to 4.7A to cater for 2 x Lowara DOC3 pumps (1.43A each) or 1 x Alma Pompe RWAD1508-2M explosion proof pump (4.7A). A suitably rated fuse must be used for each pump. These are fitted to the DIN rail mounted fuse holder/s.

Table 3– CN9 Terminals

CN9 Terminal	Description
N	Mains neutral in
L	Mains live in
P1L	Pump 1 mains live out
P2L	Pump 2 mains live out

Commoning Links

LK2 and LK3 are used to connect the relay COM terminals together as shown in Table 4.

Table 4– Relay commoning links

Link	Function
LK2	Connects the Power Fail Alarm (CN14) and Oil Alarm (CN15) relay COMMON terminals
LK3	Connects the Oil Alarm (CN15) and Water Alarm (CN16) relays COMMON terminals

Auxiliary 12V DC Output

CN10 supplies 12V DC, 250mA from the on-board power supply. This may be put to various uses. For example, as a voltage source to pass through the alarm relays clean contacts. And in turn may be then used to energise a further 12volt relay capable of handling higher voltage, such as 500v DC or 120vols DC ect, or for any other use without exceeding the current specified above. This output is Over Current Protected by a 300mA Re Settable Fuse.

General Operation

The control unit continuously monitors the condition of the connected probe assembly and the pump is operated when water is detected at the height set by the (start probe - yellow). The pump continues until the water level reaches height set at the (stop probe - blue). The current status is displayed on the LCD located on the control board visible through the window on the front of the unit. If an alarm condition is detected, a warning message is displayed, e.g. Deadstop probe activated. Operation will return to normal when the fault that caused the warning is cleared.

Detailed Operation

Normal Operation

After the initial screens have been displayed at power on, the control unit will normally display the screen below. Note, the number of pump operations shown may be different. The following will be displayed if only one pump is enabled. Note, the number of pump operations shown may be different.

Pump Operations:
000001

The following will be displayed if two pumps are enabled. Note, the number of pump operations shown may be different.

Pump 1: 000001
Pump 2: 000001

When start probe 1 detects water, the pump is started and the number of pump operations is incremented on the relevant pump. The screen is as shown below.

Pumping
Water

The pump continues to run, even when the water level drops below start probe 1 (Yellow) The pump is stopped when the water level drops below the stop probe (Blue) . The display then reverts to showing the number of pump operations.

Duty/Assist Pump Operation

For units that have the second pump enabled in the setup menu, pump use is alternated between the two pumps on successive pump operations. Also, when there is a high liquid level, the second pump is started (joins in to assist the first pump) and so empties the bund quicker.

Deadstop Warning

The deadstop probe in the probe unit is always positioned lower than the start and stop probes. If, for any reason, the stop probe should fail to detect the water level dropping below the stop probe when the pump is running, the deadstop probe will detect when the water level drops below it and stop the pump/s. This will also display a deadstop warning, as shown below, and activate the beacon on CN11.

Deadstop probe activated

Operation will automatically return to normal and the beacon will be deactivated as soon as the deadstop probe is in water again.

High Liquid Level

If the liquid level rises high enough to cause the high liquid level float switch to activate, one of two warnings will be raised depending on whether the relevant start probe detects oil or water. If oil is detected, the high level oil warning will be raised after approximately 5 seconds to prevent false triggering. If water is detected on the start probe the warning will be raised only after 5 seconds plus any user configured set time delay (from 0 to 60 minutes) has elapsed

High level oil

For units fitted with GSM capability, a text message will be sent to all numbers in the unit's internal phone number list. The message is as follows:

High level oil. Call AquaSentry on 01274 735666.

A similar text message is sent indicating high water if the high level is due to water.

Operation will automatically return to normal and the beacon (if connected) will be de-activated as soon as the liquid level is below the high liquid level float switch.

Changing Factory Settings

Certain settings can be changed by entering setup & diagnostics mode.

Entering Setup & Diagnostics

To enter setup & diagnostics mode, press and hold the "→" switch on the control unit board inside the cabinet whilst pressing and releasing the "RESET" switch. After a few seconds the screen will display "SETUP & DIAGNOSTICS." At this point, release the RESET switch. The display will then appear similar to that below.

O O O O O O D D
D D D D D D

Exiting Setup & Diagnostics

To exit setup & diagnostics mode, simply press “Once” the button marked “RESET” switch on the control unit circuit board inside the cabinet. After a few seconds the unit will resume normal operation.

Change High Level Float Switch Delay Time

This is the amount of time that the control unit will wait before raising a high level alarm when there is a high liquid level in the bund and water is detected on the relevant start (yellow) probe of the relevant probe assembly. If oil is detected on the relevant start probe when there is a high liquid level, the float switch delay time will be ignored and an alarm will be activated after approximately 5 seconds. To change the high level float switch delay time, press the “→” switch repeatedly until the display is shown as below. Note, the delay time shown may be different.

Float switch
time: 00

Use the “↑” and “↓” switches to increase and decrease the float switch delay time in increments of 1 minute. Minimum delay time is 0 minutes, maximum is 60 minutes. The new value will be saved and used when normal operation is resumed.

Resetting Pump Operations to Zero

The number of pump operations shown on the display in normal operation can be cleared to zero if required. Press the “→” switch repeatedly until the display is shown as below.

This will be displayed if only one pump is enabled. Note, the number of pump operations shown may be different.

Pump 1:
000001

This will be displayed if the second pump is enabled. Note, the number of pump operations shown may be different.

Pump 1: 000001
Pump 2: 000001

Press the “ENTER” switch on the control unit board inside the cabinet to clear the number of pump operations to zero. The zero value will be saved and shown when normal operation is resumed.

Enabling the Second Start Probe

The second start probe should be enabled when using a second probe set. It is used to detect whether a high liquid level is caused by oil or water. The factory default setting is disabled. Press the “→” switch repeatedly until the display is shown as below.

Start probe 2:
Disabled

The “↑” and “↓” switches are used to toggle between enabled and disabled. The change is immediately saved.

Setting the Number of Pumps

Normally only the first pump output is used. The second pump output can be enabled to allow use in a duty-assist mode. The factory default setting is 1 pump. Press the “→” switch repeatedly until the display is shown as below.

Number of pumps:
1

The “↑” and “↓” switches are used to toggle between 1 or 2 pumps. The change is immediately saved.

Disabling Pump on High Liquid Level

A high liquid level, oil or water, can stop the pump if this setting is set to true. The factory default setting is false. Press the “→” switch repeatedly until the display is shown as below.

Hi lev stp pump:
False

The “↑” and “↓” switches are used to toggle between true and false. The change is immediately saved. **LEAVE AT DEFAULT (FALSE)**

Enabling Outgoing GSM Text Messages

For units fitted with GSM capability, the text messages sent on high oil or high water can be enabled or disabled. Press the “→” switch repeatedly until the display is shown as below.

High oil text:
Enabled

The “↑” and “↓” switches are used to toggle between enabled and disabled. The change is immediately saved. Similarly, the high water text message can also be enabled or disabled. Press the “→” switch repeatedly until the display is shown as below.

High water text:
Enabled

Testing Probes and Outputs

During installation and for diagnostics purposes it is useful to be able to see an instantaneous display of the states of the individual probes within the probe assembly and manually activate individual outputs. On first entering diagnostics, the display will be similar to that below.

The top line of the display shows the current state of the inputs from the probe assembly/assemblies. The first, second, third, fourth and fifth characters indicate the state of the start 2, start 1, stop, deadstop and high level probes, respectively.

O	O	O	O	O	O		
D	D	D	D	D	D	D	D

The start 2, start 1, stop and deadstop probes will show 'O' when the probe is in oil or air, and 'W' when in water.

The high level probe shows 'O' for open and 'C' for closed. When a high level is detected the switch within the high level probe will be in the closed position. The bottom line of the display shows the current states of the outputs. The eight characters relate directly to the eight outputs, CN11 to CN16, along the bottom of the control unit board. Each of the characters will show 'D' if the output is currently disabled or 'E' if the output is currently enabled. Use the "←" and "→" switches on the control unit board to move the flashing cursor over the output to be changed. Use the "↑" and "↓" switches to change the state of the output between enabled and disabled.

If a modem is to be used on the BWCU Refer to the GSM supplied supplement: which explains how to use the unit via the GSM network

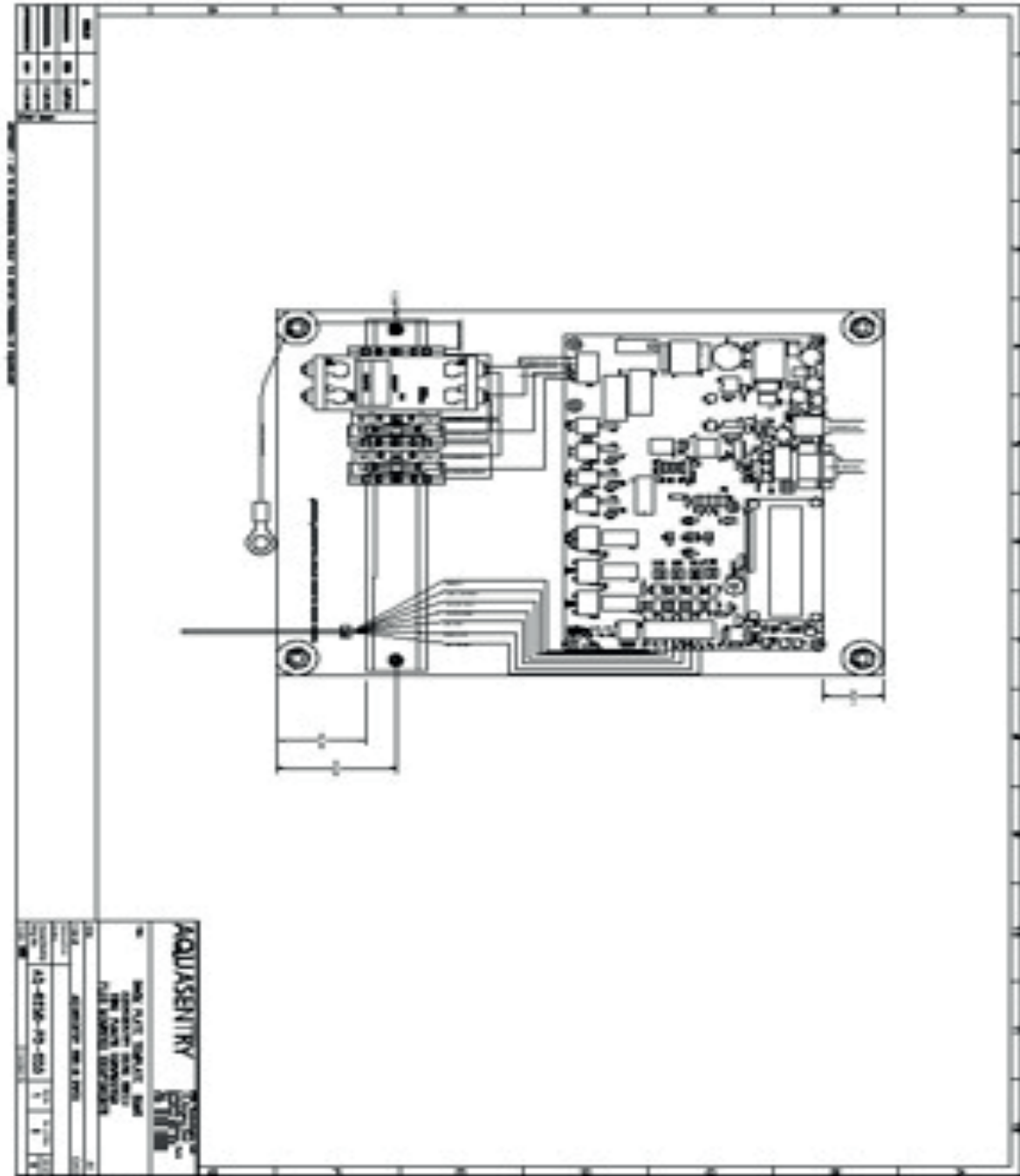
Ref part no: AQUA-025-GSM.

Aquasentry 025-GSM (programming using simple text messaging from a mobile phone)

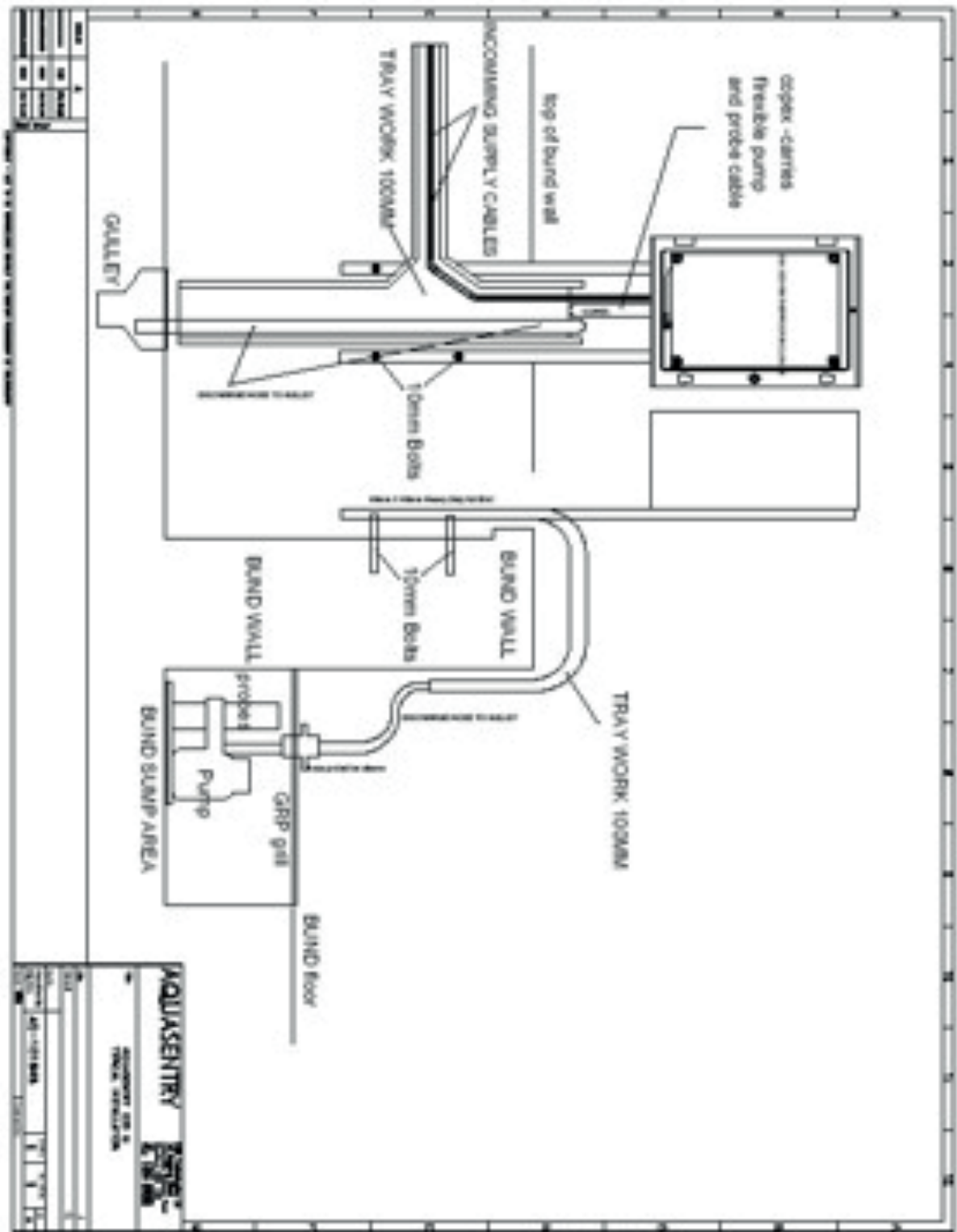
Ref part : AQUA-025-GSM.

The supplement is Only supplied as standard when ordered as a complete unit, if at a later date the modem is applied please refer to the part ref above.

Standard Panel layout and wiring scheme



Typical Installation



Bund Water Control Unit Parts List

Parts Description

Sund Water Control Unit
Doc3 Pump
Doc 7 Pump
Sund Water Control Probe Set
Lifting Rope
Anti Syphon Device
Probe/Pump Base Plate
Discharge Hose (per metre)
GRP Enclosure

Maintenance & Repair

The Bund Water Control Unit should be maintained on a 6 monthly basis. As part of the Maintenance regime, the following should be reviewed

- Testing that all pumps are in full working order
- Inspection and cleaning of the probe sets
- Checking of the telemetry is in working order and functioning to its highest level.
- The sump area is clean and without blockages.

In the event of repairs being required, the user should contact Aquasentry on 01924 284900 in the first instance.

DECLARATION OF CONFORMANCE 024/025G

Name & Address of Manufacturer:

AquaSentry, Unit 2, Britannia Mills, Gelderd Road, Birstall, WF17 9QD
Tel: 01924 284900 Fax: 01924 284911

Registered office:

Bowcliffe Hall, Bramham, Wetherby, West Yorkshire, LS23 6LP

Bund Water Control Unit (BWCU)

The standard I 024S I 025G units are designed to remove rainwater from bunded areas enabling their designed retention capacity, for oil spillages to be maintained.

The BWCU is supplied as a single unit (024S) the (025G) is Equipment NORMALLY supplied, as a Single Unit. The (025G) can also be configured to work as a Dual Unit, which is capable of operating TWO pumps on 50% Duty Cycle, as such it will Automatically enable the second pump to assist (join in the effort with the first pump), or if the first pump has failed the second pump starts.

The 025G has (optional) GSM text message capability. To operate as described above it Requires one or two probe uniVs (code 031), submersible pump/s, discharge hose/s and anti siphon device/s.

Notified body for certification

PMD Technologies (T/A AquaSentry), Unit 2, Britannia Mills, Gelderd Road, Birstall, WF17 900
Tel: 01924 284900 Fax: 01924 284911

Harmonised Standards

Compliance with Health and Safety Requirements has been assured by compliance with: EN13980

Authorised officer of manufacturer

Rob Staines

AQUA SENTRY



Operating Manual

Bund Water Control

Type 025-G

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