Issue 24.01

AQUACELL PORTABLE WASTEWATER SAMPLERS

USER GUIDE

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
Sira MC 050059

AQUAMATIC
Wastewater Samplers for the World

SECTIONS

AQUAMATIC PRODUCT WARRANTY & BASIC TERMS OF SUPPLY

Congratulations on choosing an Aquamatic Product. When used and maintained properly, this equipment should provide many years of reliable service

As a mark of confidence each new Aquamatic Product is supplied with the following 12 month Warranty:

> Electrical and / or mechanical defects occurring during the 12 months from date of invoice will be rectified free of charge provided the defective item is returned carriage paid to the supplier during this 12 month period (see MAINTENANCE section for details of returns procedure)

Please read this User Guide carefully, as neither Aquamatic Ltd. nor its agents accept responsibility for any damage or defect caused by misuse, abuse, neglect or incorrect operation

Aquamatic products and equipment are NOT suitable for use in areas classified as hazardous zones. Aquamatic products are subject to continuous development and improvement. Components and specifications may change or be withdrawn without notice

One copy of this 'User Guide' is provided with your Aquamatic Product. This is intended to assist the reader in the effective application of the product and although the information contained is given in good faith, Aquamatic Ltd. accepts no responsibility or liability for any loss or damage arising from the use of information provided or from information being omitted

In any event Aquamatic Ltd accepts no liability for any consequential loss or damage arising from the use or failure of the product or any information provided, including, but not limited to, economic or financial loss, damage to peripheral equipment or products, loss of use, productivity or time

All equipment is supplied subject to Aquamatic Standard Terms & Conditions of Sale, this will be supplied with each order acknowledgment, and is also downloadable from the Aquamatic website or can be emailed, on request, from the Aquamatic head office

CONTENTS OF PACKAGE

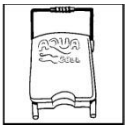
Congratulations on buying your new Aquacell P2 Wastewater Sampler!

Before assembling your Sampler please check carefully that the contents of the package match the your delivery note and in turn the items specified on your purchase order

Transit damage, or discrepancies, should be reported to Aquamatic immediately. If transit damage is not reported within 48 hours, transit insurance will be invalidated and the cost of repair will be chargeable

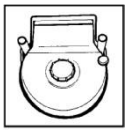
Samplers

Aquacell P2-COMPACT Portable Wastewater Sampler CL-1010



Aquacell P2 Sampler unit

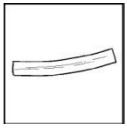
Intake Hose



Base, Compact

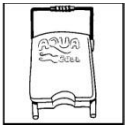
2 x Fixing Screws

User Guide



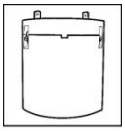
Spare Volume Control Tube

Aquacell P2-COOLBOX Portable Wastewater Sampler CL-1020

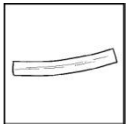


Aquacell P2 Sampler unit

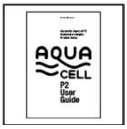
Intake Hose



Base, COOLBOX

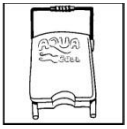


Spare Volume Control Tube



User Guide

Aquacell P2-MULTIFORM Portable Wastewater Sampler CL-1030



Aquacell P2 Sampler unit

Intake Hose

Base, MULTIFORM

2 x Fixing Screws

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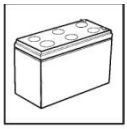
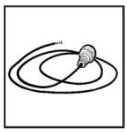
Spare Volume Control Tube

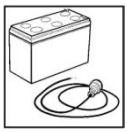
Power Options



Integral Battery CL-2001



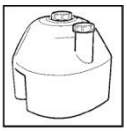
Mains Connection CL-2003-*volts / hz*



Mains Connection with Integral Float Charged Backup Battery CL-2005-*volts / hz*

Separate 12V Lead Acid Battery Connection CL-2002

Sampler Collection Vessels



25 litre Polyethylene Container

CL-3001

12 x 1 litre PET Bottler

CL-3003

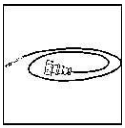
12 x 0.75 litre Glass Bottler

CL-3002

24 x 1 litre HDPE Bottler

CL-3004

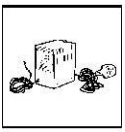
Optional Equipment - Electrical



Ancillary Signal Connection - Basic CL-4004

Partial Internal Part

Anti-Condensation Heater – PPI CL-4144-*volts / hz*

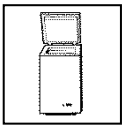
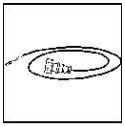


Battery Charger

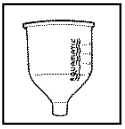
1 way – UK Plug	CL-4002-*volts / hz*
1 way – Euro Plug	CL-4119-*volts / hz*
5 way – UK Plug	CL-4060-*volts / hz*
5 way – Euro Plug	CL-4150-*volts / hz*

Partial Internal Part

Bottler Connection - Basic CL-4001

	Data Connection	CL-4006
	Freezer – Bulk – 230V/50Hz	CL-4022
	Freezer – Standard – 230V/50Hz	CL-4020
	Sample Temperature Monitoring – Portable – P2-COOLBOX	CL-4005
	Sample Temperature Monitoring – Portable – Non P2-COOLBOX	CL-4148
Partial Internal Part	Thermostatic Remote Control Trigger	CL-4149
	Pressurised Pipeline Interface – Standard	CL-4147-*volts / hz*

Optional Equipment - Mechanical

	Intake Hose Extension – 2m	CL-4008
	Sample Chamber – Glass Supplement	CL-7077
	Security Cord	CL-4019
	Security Padlock	CL-4055
	Transportation Truck	CL-4133
	Thermal Jacket – P2	CL-5115

2 INTRODUCTION

Safety First

Infection

Aquacell Wastewater Samplers and the associated Sample Collection Vessels have been designed to minimise the risk of operator contact with the potentially hazardous wastewater medium, however great care should always be exercised when working in close proximity to wastewater. Particular attention should be paid to the following points:

1. Always wear appropriate PPE for the types of effluent being sampled
2. Wash hands thoroughly after handling contaminated sampler parts
3. Do not allow wastewater to come into contact with any open wounds or skin abrasions
4. If any glass has become cracked or chipped replace immediately to avoid the risk of cuts

Electrical

Where chosen the P2 Samplers can be mains powered and receive power directly from the AC mains supply. Provision for and connection of an appropriate power supply must be carried out by a suitably qualified electrician to the end of the mains cable provided with the equipment, see 'Installation Section' for further details

Once correctly installed all mains connections on the equipment are safely housed behind fixed covers and contact with dangerous voltages is avoided. Always check the integrity of the mains cables/connectors before and during use

Mechanical

Care should be taken, whilst the sampler is in operation, to avoid trapping fingers in the Pinch Valve Assembly, whilst this does not pose a serious injury risk it could cause some discomfort

Care should be taken when lowering the Sampler module onto its base, to avoid trapping fingers where the plastic plugs meet the aluminium socket tubes

The Sampler can be supplied with a glass Sample Chamber and glass Sampler Collection Vessels, if this is the case care should be taken when handling as these can be very slippery when wet

The User Guide

The Aquacell P2 sampling system is designed for ease of operation and maintenance. If followed carefully the instructions given in this guide should quickly enable you to assemble, program and deploy your new Aquacell Sampler and start to benefit from the collection of truly representative samples of your wastewater

This User Guide relates to the complete Aquacell P2 Portable Wastewater Sampler range. Much of the information supplied applies equally to all formats, however, where

information relates to a specific format, Sample Collection Vessel or Optional Equipment then this will be stated

The Sampling Process

The Aquacell P2 Wastewater Sampler extracts individual Sample Shots from a wastewater channel or vessel according to a predetermined program and deposits them into one or more Sample Collection Vessels. In this way the user is provided with a representative sample of the wastewater discharge

Unless specified with an optional Pressurised Pipeline Interface, Aquacell Wastewater Samplers are only suitable for use on non-pressurised effluent sources

The benefits of using a Sampler to automatically collect volumes of the wastewater effluent are varied but are often:

a) Reduce the pollution load of the discharge (to fall within consent limitations)
b) Reducing water company effluent charges
c) Reducing product wastage

Following collection the way in which the samples are processed will vary from application to application. For example samples can be:

- Analysed using in-house laboratory facilities – when the objective of taking samples is to gain a greater knowledge of the discharge profile
- Sent to a specialist analytical laboratory for analysis - when an independent assessment of the discharge is required
- Made available to the local Water Company as a source of data on which to base charges. Self-monitoring is being increasingly encouraged by water companies both in the interests of accurate charging and to encourage dischargers to improve plant efficiency, and so reduce the pollution load of their discharge

The Aquacell P2 Portable Sampler Range

The Aquacell P2 range of Portable Automatic Wastewater Samplers are designed for flexibility of application with simplicity of operation

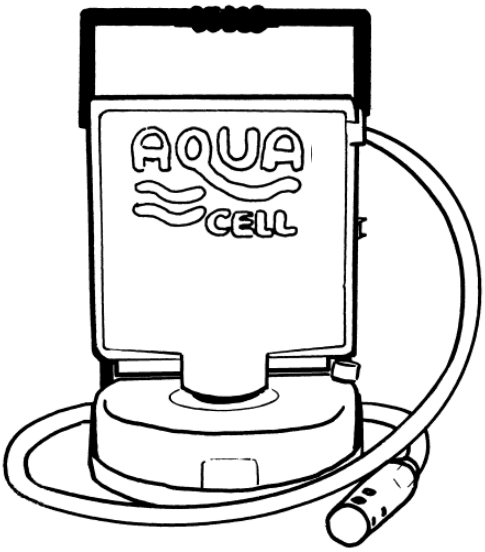
As with all Aquamatic Samplers each model in the Aquacell P2 range is compliant with the UK Environment Agencies MCERTS standard for Automatic Wastewater Sampling Equipment

The Aquacell P2 sampling system is designed such that conversion from one variant to another is readily achieved by simply transferring the Aquacell Sampler module from one base to another

The range has 3 primary variants, all centred around on a common Aquacell sampler module. The variants are as follows:

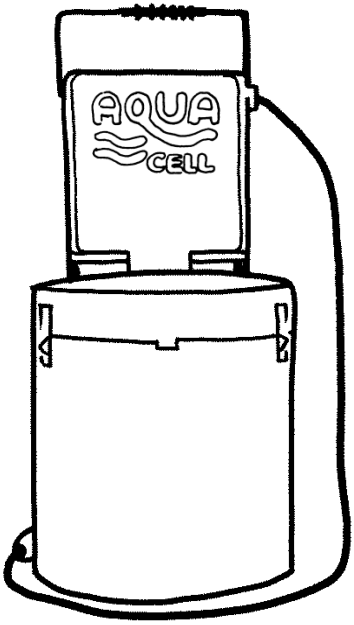
Aquacell P2-COMPACT

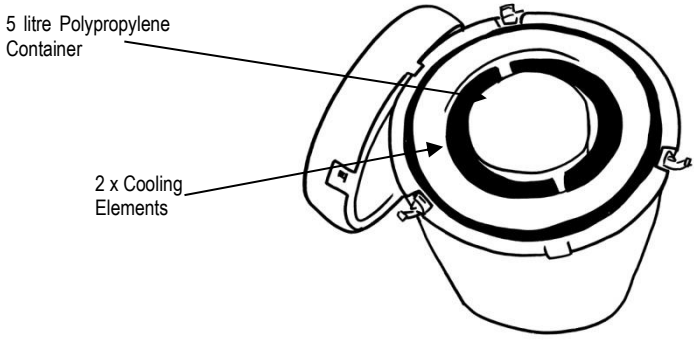
As its name suggests, the P2-COMPACT is a super-compact unit and includes a low profile 5 litre polyethylene Sample Container



Aquacell P2-COOLBOX

This variant collects samples in a 5 litre polypropylene sample container and stores them for up to 5 days at between 0°C and 5°C (this is deemed to be the optimum storage temperature range for bio-degradable samples)

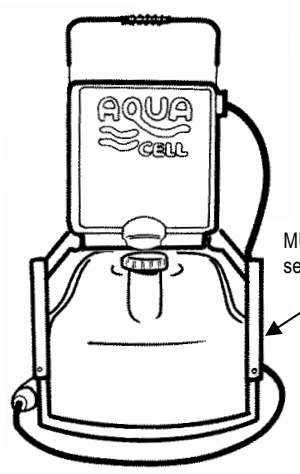




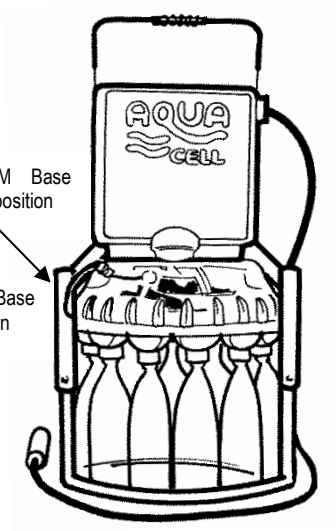
** Optimum sample temperature holding duration will vary considerably with ambient temperature*

Aquacell P2-MULTIFORM

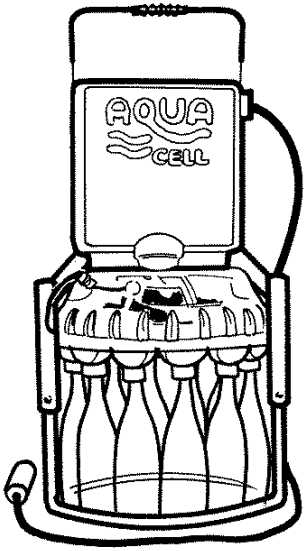
This variant has a choice of 4 Sample Collection Vessels:



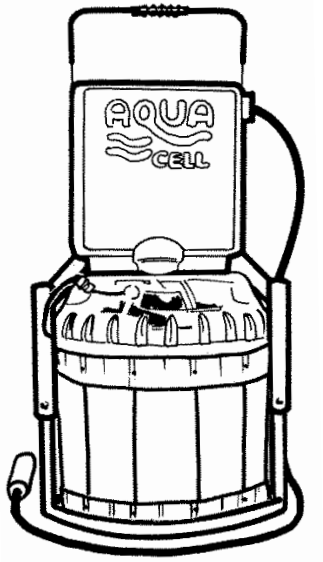
P2-MULTIFORM with 1x25 litre Container



P2-MULTIFORM with 12x0.75 litre Glass Bottler



P2-MULTIFORM with 12x1 litre P.E.T. Bottler



P2-MULTIFORM with 24x1 litre Bottler

Sample Collection Vessels

Once a sample has been taken it needs to be stored whilst awaiting collection by the user. For this reason all the models in the Aquacell range can be supplied with a variety of Sample Collection Vessels

Single Containers

In many applications a single composite sample is all that is required. For these situations Aquamatic offer a range of single container Sample Collection Vessels, all of which incorporate a sealed lid / cap and easy clean design

Bottlers (available with P2-MULTIFORM only)

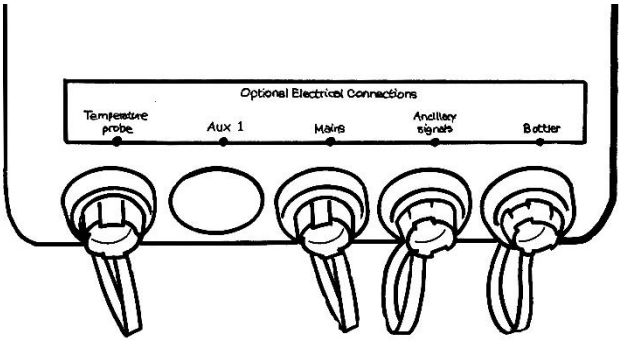
When a more detailed look at your wastewater profile is required it is often necessary to distribute collected samples into separate containers, each representing a specific time period or number of samples. For these situations the Aquacell P2-MULTIFORM can be provide a range of multi-bottle Sample Collection Vessels. These types of Sample Collection Vessels can be provided in a Removable format only

Removable Bottlers

Apart from the pluggable connection cable, Removable Bottlers are fully independent from the Aquacell Sampler unit. As such the complete Bottler (including distribution mechanism and bottles) can be removed from the Sampler. This is particularly useful when there is the need to remove a full set of Bottles for analysis

Optional Equipment

Optional Connections are located on the rear of the Sampler module as follows:



Sample Temperature Monitoring (Temperature Probe Connection)

All Aquacell P2 Portable Samplers can be supplied with the facility to monitor collected Sample Temperatures

The temperature (including the corresponding time and date) of the composite sample is recorded every 5 minutes commencing immediately after the first programmed sample is attempted

Sample temperature data can be outputted to a suitable computer or hand held device via the optional Data Connection, details of how to set this up can be found in Section 'Operation > Basic Operations'

Aux 1 (multi-function connection)

This connector is commonly supplied as the Separate 12VDC Lead Acid Battery Connection. As such it will be supplied with a 1.5m cable incorporating red and black crocodile clips for connection to a suitable third party battery. Additional functionality via this connector is available such as connection to a Pressurised Pipeline Interface.

Mains

When required Aquacell P2 Samplers can be powered from a mains power supply. When specified this connection will be supplied with a 1.5m mains cable

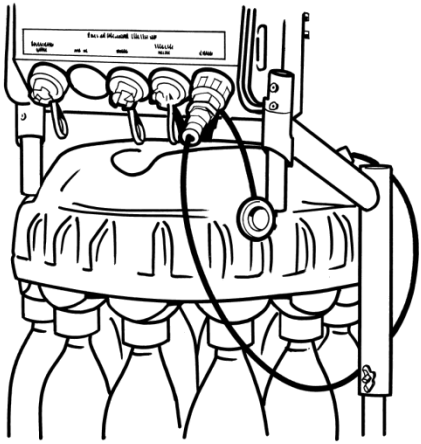
Ancillary Signal Connection (Ancillary Signals connection)

Required when connecting Sampler to peripheral equipment. When connected to appropriate flow monitoring equipment, this connection enables the Sampler to extract sample on a flow proportional basis. Accepts flow input (4-20mA or volt-free contact closure) and Remote Control input. Additionally this connection can provide Sample Acquired and Sampler Warning outputs

Bottler

Often there is a need to separate collected samples into individual containers. For this purpose the Aquacell P2-MULTIFORM model can be supplied with various multi container Bottlers. All Aquamatic Bottlers comprise a Distributor Unit characterised by its transparent Distributor Dome, a Distributor Pipe and a Bottle Carrier

Showing 12x1 PET Bottler connected to Aquacell P2-MULTIFORM Sampler



Pressurised Pipeline Interface

The Pressurised Pipeline Interface (PPI) works in conjunction with any of the Aquacell Sampler range. Providing an interface between the Sampler and a pressurised Sampling Point, the PPI gives the Sampler the ability to extract representative samples from pipelines under pressure. Further information on the PPI should be found in the User Guide Supplement titled 'Pressurised Pipeline Interface'

Security

Each of the Samplers in the Aquacell P2 range have a number of locking points, these can be individually secured using suitable padlocks (Security Padlock CL-4055) to prevent unwanted interference. Alternatively, Aquamatic offer the Security Cord (CL 4019) which can be passed through each of the locking points in turn, the Sampler is then made tamperproof with just a single padlock. Additionally, the Security Cord provides the means to tether the Sampler to an appropriate anchor ring (or similar) located near the sampling point

3 INSTALLATION

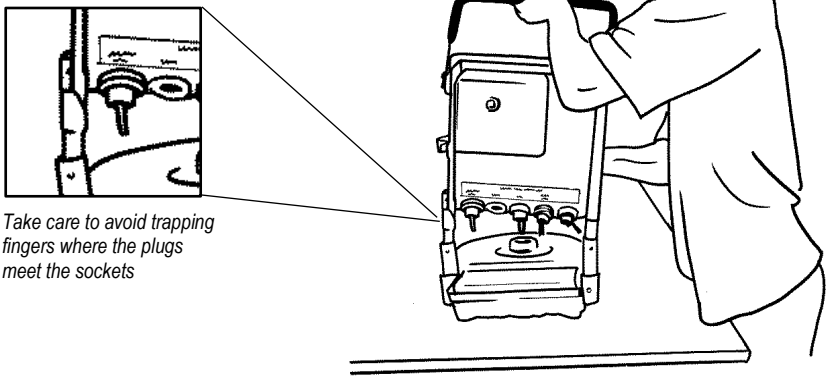
Assembling & Connecting

Aquacell Sampler

Attach the Sampler unit to the base as follows:

1. Stand the base on a convenient level surface such as a bench or desk
2. The Sampler unit has a white plug at the bottom of each side cheek. These plugs locate in the black metal sockets in the base. Lower the Sampler onto the base engaging the plugs in the sockets

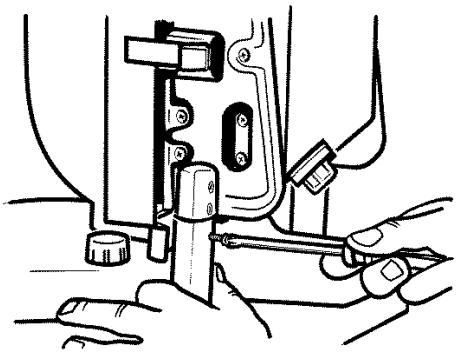
Sampler module being lowered onto a P2-COMPACT base



Take care to avoid trapping fingers where the plugs meet the sockets

3. Insert fixing screws to secure the Sampler to base (COMPACT / MULTIFORM only)

Inserting 2 x fixing screws



Ensure Pinch Valve Tube is correctly located in the top of the Sample Collection Vessel

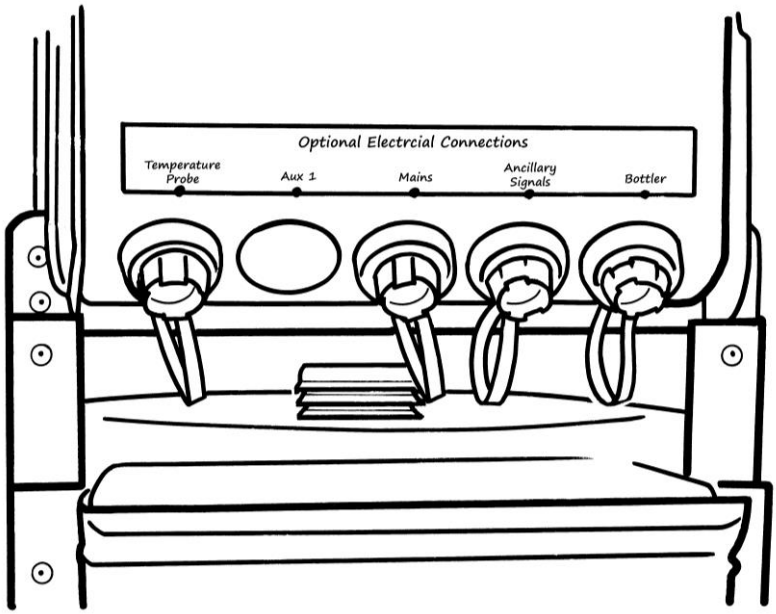
Connect Intake Hose to Top Pipe on right hand side of Sample Chamber assembly, firmly tightening thumb screw to clamp Intake Hose onto the pipe

Pressurised Pipeline Interface

The Pressurised Pipeline Interface (PPI) works in conjunction with any of the Aquacell Sampler range. Providing an interface between the Sampler and a pressurised Sampling Point, the PPI gives the Sampler the ability to extract representative samples from pipelines at pressures up to 6 BAR. Further information on the PPI should be found in the User Guide Supplement titled 'Pressurised Pipeline Interface'

Optional Connections

Optional Connections should be set up as follows:



Temperature Probe

Insert the Sample Temperature Probe into the selected Sample Collection Vessel. Connect the waterproof connector at the end of the probe cable to the appropriate position on the bottom rear of the Sampler unit

The temperature (including the corresponding time and date) of the composite sample is recorded every 5 minutes for 24 hours commencing immediately after the first programmed sample is attempted. For the following 24 hour period the temperature is recorded every 15 minutes

When specified temperature data can be outputted to a suitable computer or hand held device via the optional Data Connection, details of how to set this up can be found in Section 'Operation > Basic Operations'

Aux 1 (multi-function connector)

This connector is commonly supplied as the Separate 12VDC Lead Acid Battery Connection. As such connect the waterproof connector at the end of the supplied 12VDC Battery Cable to the port marked 'Aux 1' on the bottom rear of the Sampler unit

Electrical Mains Power Supply Installation

A suitable electrical supply should be provided to the equipment, see 'Technical Section' for further details. Provision for and connection of an appropriate power supply must be carried out by a suitably qualified electrician

Permanently connected equipment must have either an 'all pole' switch or circuit breaker (live and neutral conductors). The switch or circuit breaker must be included as part of the installation, it must be suitably located or easily reached and must be marked as the disconnecting device for the equipment

As the equipment is intended to go in potentially wet areas it is advisable to fit an RCD or RCBO (GFI/GFCI) in the circuit to protect operators from hazards

Connect the waterproof connector at the end of the mains cable to the port marked 'Mains' on the bottom rear of the Sampler unit. Connect the unterminated end of the mains cable to the power supply

NOTE 1: As standard mains cabling is wired as:
Brown = Live Blue = Neutral Green/Yellow = Earth

NOTE 2: Where selected for USA & Canada mains cabling is wired as:
Black = Live White = Neutral Green = Earth

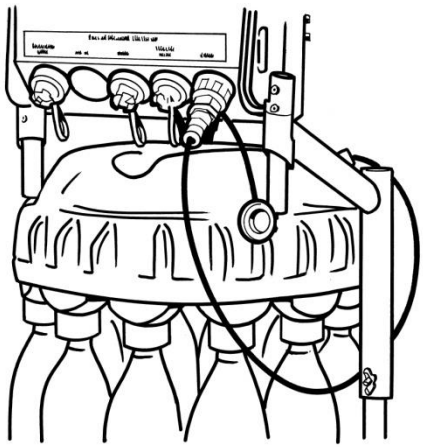
Ancillary Signals

Connect the waterproof connector at the end of the Ancillary Signal Cable to the port marked 'Ancillary Signals' on the bottom rear of the Sampler unit. The free end of this cable has 8 colour coded cores. Remove insulation from the ends of the cores required for the application and terminate as detailed in the Ancillary Signal Connection diagram on the following page

Bottler (P2-MULTIFORM)

Connect the waterproof connector at the end of the Bottler Cable to the port marked 'Bottler' on the bottom rear of the Sampler unit

Diagram shows 12x1 PET Bottler connected to P2-Sampler Module



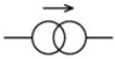
All Aquamatic Bottlers comprise a Distributor Unit characterised by its transparent Distributor Dome, a Distributor Pipe and a Bottle Carrier. It is important when locating the Distributor Unit on the Bottle Carrier that the polarising slot in the Distributor Dome engages with the corresponding peg on the Bottle Carrier

Ancillary Signal Connection Wiring Table

Flow Meter Input * – Option A
Integrated flow impulse signal – Normally open volt free contact

Cable Cores	*Pin No.*	*Notes*
Black (common)	1	Inputs should be a 'Normally Open' volt free contacts Minimum contact closure period >30ms followed by minimum opening period of >20ms
Red	2	

Flow Meter Input * – Option B
Isolated 4-20mA flow analogue signal



Cable Cores	*Pin No.*	*Notes*
Red (- negative)	2	
Blue (+ positive)	5	

Remote Control Input (typically from pump controller or PLC etc.)

Cable Cores	*Pin No.*	*Notes*
Black (common)	1	Inputs should be a 'Normally Open' volt free contacts Minimum contact closure period >50ms
Green	4	

Sample Acquired Output (typically connected to logging device)

Cable Cores	*Pin No.*	*Notes*
Yellow	3	Outputs are 'Normally Open' volt free relay contacts rated at 50VDC 1A
Brown	7	

Sampler Warning Output (typically connected to alarm monitoring system)

Cable Cores	*Pin No.*	*Notes*
White	6	Outputs are 'Normally Open' volt free relay contacts rated at 50VDC 1A NOTE: Contacts are CLOSED when system is healthy
Violet	8	

* Peripheral equipment should connect directly to the Sampler via the supplied 1.5 metre long Ancillary Signal Cable. Where this is not possible, due to site conditions, then appropriate isolators should be sourced and fitted to the wires where necessary

Deploying the Sampler

Positioning

Aquacell Wastewater Samplers are NOT suitable for use in areas classified as hazardous zones

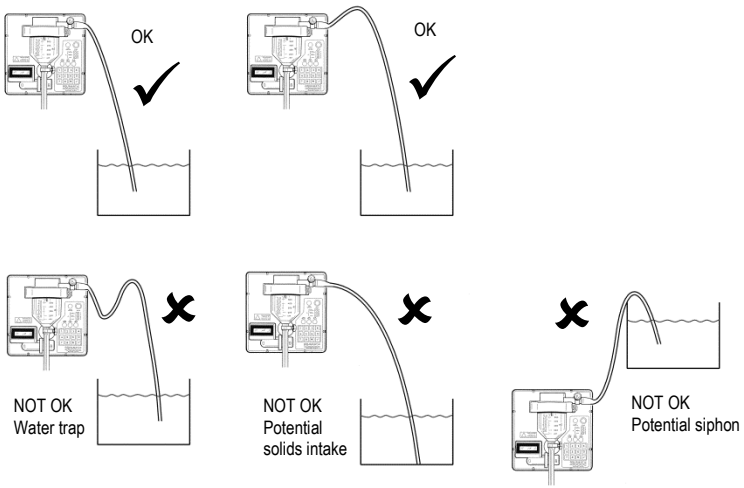
The Sampler should be stood on a substantial, flat, level surface. It should be located as close as possible to the sampling point and ideally at a level such that the Sample Chamber outlet pipe is always above top water level of the liquid from which the samples are to be taken

When choosing the position for the Sampler, consideration should also be given to the correct installation of the Intake Hose (see 'Routing the Intake Hose' section below)

Routing the Intake Hose

The Aquacell P2 Intake Hose is 2 metres long but if the required length is greater than 2 metres then one or more 2 metre Intake Hose Extensions can be added as required

The following diagram should be considered when routing your Intake Hose



Additionally the following points should be considered when installing your Intake Hose:

- Ensure that there are no leaks in Intake Hose joints. Leaks will cause air bubbles in the water being drawn up the Intake Hose and, in turn, the Samplers lift velocity will be degraded

- Ensure the stainless steel Intake Filter is always fully immersed. A partially immersed Intake Filter will result in excessive splashing as effluent enters the Sample Chamber. This can in turn lead to warnings and possible damage to your Sampler
- Restrain Intake Hose such that the Sampler is always able to extract a representative sample in all flow conditions. The Intake Hose Support Bracket Kit Part No. CL-4010 can be used for this purpose
- Try to ensure that the Intake Hose either runs steadily up to the Sampler or up to a high point (say a channel wall) and down to the Sampler. The Intake Hose in both the above arrangements would be self-draining, this will help to ensure that a representative sample is taken

Setting the Sample Shot Volume

The Sampler is supplied from the factory to extract a nominal 100ml Sample Shot volume and in many applications this is adequate. Certain applications may require an alternative sample shot volume; this is extremely simple to set up:

1. Remove the Sample Chamber/Top Assembly from the Sampler (as detailed in Section 5 'Maintenance' sub-section 'Cleaning') and separate the Sample Chamber from the Chamber Top
2. For Sample Shot volumes greater than 100ml simply cut the silicone rubber Volume Control tube to the required length (approximate shot volume lengths are shown on the side of the Sample Chamber)
3. For sample shot volumes less than 100ml remove the existing silicone rubber Volume Control Tube and replace it with the spare Volume Control Tube (as supplied with the Sampler). Cut the new tube to the required length (approximate sample shot volume lengths are shown on the side of the Sample Chamber)

Note: Where a more precise sample shot volume is required, volumes can be fine-tuned using alternative means e.g. measuring cylinder, weight. Sample shot volumes can be checked and the Volume Control tube length progressively adjusted between samples until the required sample shot volume is achieved

Conditioning the Cooling Elements (Aquacell P2-COOLBOX)

The Aquacell P2-COOLBOX incorporates a passive cooling system which uses a combination of proprietary Cooling Elements (CL-6017) and thick wall insulation in the COOLBOX base and lid. This will maintain the collected samples at a nominal 4°C (optimum storage temperature)

In order to maintain a nominal 4°C sample temperature for the maximum length of time, the Cooling Elements should be prepared as follows:

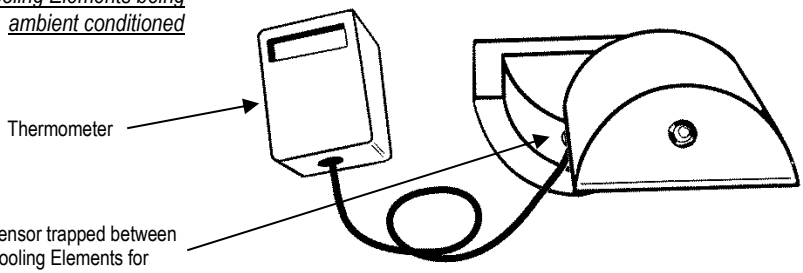
Equipment required:

- Freezer - Capable of being accurately controlled at a temperature of –7°C.
  Aquamatic offer a choice of 2 freezers suitable for this purpose:
  Freezer, Standard, (CL-4020) (suitable for 1 or 2 pairs of Cooling Elements)
  Freezer, Bulk (CL-4022) (suitable for 10 pairs of Cooling Elements)
- Thermometer - Capable of measuring the surface temperature of a Cooling Element
  Thermometer (CL-4021)

Method

- Place the Cooling Elements in the Freezer after it has allowed to reach its operating temperature. Orientate as follows:
  Freezer, Standard - Orientate as they are in the COOLBOX Base
  Freezer, Bulk - Place Cooling Elements in 2 layers. The bottom layer is placed upside down and the top layer the correct way up
- It is important to orientate the Cooling Elements correctly in the freezer. Incorrect orientation can result in the elements bulging during the freezing process, which can make it difficult or impossible to locate them correctly in the COOLBOX base
- Leave the cooling elements to become fully frozen. Starting with the cooling elements at 20°C this can take up to 18 hours
- Remove the Cooling Elements from the freezer place them in a nominal 20°C ambient and orientate them with a suitable thermometer typically as shown in the diagram on the next page (where multiple pairs of Cooling Elements are being conditioned only one pair needs to be monitored)
- Leave the Cooling Elements to warm up to 0°C
- If the ambient temperature where the Sampler is to be deployed is expected to be in the range –10°C to 0°C, leave the Cooling Elements for a further 30 minutes before deploying, otherwise deploy immediately in the COOLBOX Base

Cooling Elements being ambient conditioned



Power

The procedure for connecting power to the Sampler depends on which power option has been selected, the options are as follows:

Integral Battery

- Release the stainless steel clasp on the top rear of the Sampler
- Hinge down the Battery Cover
- Place the Battery in position against rear and side bulkheads, with terminals adjacent to battery leads. Make sure Battery is pushed firmly against the side bulkhead
- Stretch the rubber Battery Restraint Band over the Battery and hook over the keeper
- Push the battery connector firmly onto the corresponding connector on the Sampler
- Hinge up the Battery Cover and hook the stainless steel clasp over its keeper

Mains Connection

- The Mains Cable should have been connected to a suitable power source by a qualified electrician, see earlier in this section for details
- Use the customer supplied mains isolator to switch power either on or off to the Sampler
- If it is necessary to move the Sampler, make sure the isolator is in the off position then the Mains Cable waterproof connector at the bottom rear of the Sampler, marked Mains, can be unplugged
- To reinstate power to the Sampler, plug the waterproof connector back into the connector marked Mains, and switch the mains isolator back to on

Mains Connection with Integral Float Charged Battery

- Proceed as for 'Integral Battery' Power Option above, then
- Proceed as for 'Mains Connection' Power Option above

Separate 12VDC Battery Connection

- Connect 12VDC Lead Acid Battery Cable to Sampler as detailed in 'Optional Connections' sub-section earlier in this section
- Connect the two battery crocodile clips to your battery (black battery clip to negative (-) terminal, red battery clip to positive (+) terminal)

Charging the Sampler Battery

- Remove the Sampler Battery from the Sampler (see Integral Battery point on previous page for details)
- Connect the red / black Battery connector to the corresponding connector on the Battery Charger
- Connect the Battery Charger power cable to a suitable the AC power outlet and switch on. Supply voltage must match that indicated on the serial number label on the rear of the charger. Unplug the AC cable from the mains power outlet or switch off before

disconnecting the charger from the batteries. This avoids the possibility of spark generation

- The indicator lights on the Battery Charger should be interpreted as follows:

INDICATOR	STATUS	COMMENTS
RED	Static ON	Power is on (will switch off when charging)
YELLOW	Static ON	Charging Battery *
YELLOW	Flashing	Battery is 80% charged
GREEN	Static ON	Battery is fully charged. Float charging in process
YELLOW & RED	Flashing	BATTERY RECOVERY MODE Battery has been deeply discharged and the Charger is in soft charge recovery mode
GREEN	Flashing	FAULT CONDITION This maybe due to a Battery defect or a fault in the Battery Charger. Both Battery and Battery Charger should be tested

* Maximum charge time is approximately 8 hours

Battery performance will vary greatly depending on the following:

1. Initial delay – The period before the first Sample is taken should be minimised for maximum battery performance
2. Sample Interval – The time between samples should be minimised for maximum battery performance
3. Purge times – These should be minimised for maximum battery performance
4. Lift height– This should be minimised for maximum Battery performance
5. Battery age - Battery capacity will reduce with age
6. Battery charge condition - Battery should be kept on continual charge until being deployed
7. Ambient temperature - Battery capacity will reduce with ambient temperature
8. LOW POWER MODE – If selected in the Program (see Programming Section for details) then quiescent current is reduced to a minimum

Note: The Sampler Battery supplied by Aquamatic is a Valve Regulated Lead Acid type (VRLA). These batteries are very recyclable. Please ensure that spent batteries are safely returned to Aquamatic Ltd, your distributor, or an approved waste handling/disposal organisation. For neutralized spills, place residue in acid-resistant containers with sorbent material, sand or earth and dispose of in accordance with local regulations

4 OPERATION

Definitions

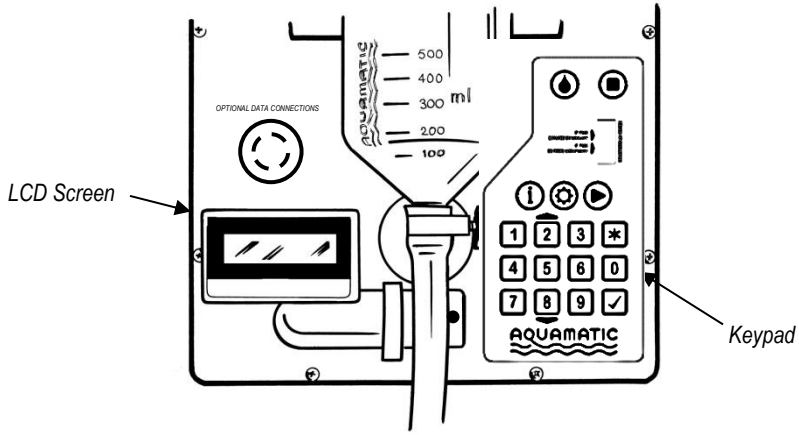
SAMPLE SHOT	A single aliquot of liquid extracted from a specific sampling point
SAMPLE	One or more SAMPLE SHOT's taken in immediate succession
SPOT SAMPLE	A manual SAMPLE initiated by pressing the 'SPOT SAMPLE' button
PROGRAM	The user defined sampling instructions which are entered into the Sampler
SYSTEM SETTINGS	Core Sampler settings e.g. Time, language, configuration, operating mode etc.
PROGRAM SETTINGS	Start and stop times, sampling frequency, time / number of samples per bottle (multiple bottle formats) etc.
SAMPLE ROUTINE	A sequence of SAMPLE's taken in line with the PROGRAM

Basic Operation

Controlling the Sampler

The Sampler is controlled and programmed using the panel mounted keypad in conjunction with LCD screen

Front Panel of Sampler Module



The keypad is divided into circular operating buttons and square programming buttons:

Operating Buttons

SYMB	DEFINITION	DESCRIPTION
●	SPOT SAMPLE	Manually initiates a single sample (available either in standby or during a running program)
■	STOP	Aborts a running program or Sample Shot
i	INFORMATION	Gives access to various Sampler information
☼	SET PROGRAM	Allow user to setup specific sampling program parameters
▶	RUN PROGRAM	Initiates users sampling program

Programming Buttons

SYMB	DEFINITION	DESCRIPTION
✱	TOGGLE	Step through available options or return to the start of a date / time entry
O - 9	NUMBER ENTRY	Numerical selections
✓	ACCEPT	Enter / move to next selection
▲(key 2)	SCROLL UP	Steps up Event and Warning logs in information menus
▼(key 8)	SCROLL DOWN	Steps down Event and Warning logs in information menus

Taking a Spot Sample

SPOT SAMPLE ● is an Operating button on the Keypad. This button can be pressed both in Standby mode and during a running program and will activate a single sample. Each sample will be collected as follows:

IDENT	DISPLAY	ACTION / COMMENTS
SPOTSAM1	==SAMPLING NOW== CLOSE VALVE	Pinch Valve closes on the Pinch Valve Tube connected to the outlet of the Sample Chamber ➔ See SPOTSAM2
SPOTSAM2	==SAMPLING NOW== PRE PURGE	Air is blown into the Sample Chamber and down the Intake Hose. This will purge any standing effluent from the Intake Hose ➔ See SPOTSAM3
SPOTSAM3	==SAMPLING NOW== INTAKE	Effluent is drawn up Intake Hose and into the Sample Chamber at a nominal 0.5 metres / second. Effluent fills the Sample Chamber up to the 2 long electrodes protruding down from the Sample Chamber Top ➔ See SPOTSAM4

SPOTSAM4	==SAMPLING NOW== POST PURGE	Excess effluent is purged from Sample Chamber back up the Volume Control Tube and down the Intake Hose until the level reaches the bottom of the Volume Control Tube. This leaves a measured volume in the Sample Chamber, this is the Sample Shot ➔ See SPOTSAM5
SPOTSAM5	==SAMPLING NOW== SAMPLE RELEASE	Pinch Valve opens and the collected Sample Shot is released into the specified Sample Collection Vessel ➔ See DEFAULT

Programming

Once your Aquacell Sampler has been installed, connected to any optional equipment, switched on, and you have become familiar with the basic operations, it is then necessary to input your specific sampling program requirements.

The tables below show the various screens used to program your Sampler. The 'DISPLAY' column shows the default option on the second line and alternative options below in square brackets [ ]

IDENT	DISPLAY	ACTION / COMMENTS
DEFAULT	AQUACELL READY	Press SET PROGRAM ☼ button to program the Sampler ➔ See SETPROG
SETPROG	SELECT MODE ∗ PROGRAM SETTINGS [SYSTEM SETTINGS] [SPECIAL OPTIONS]	Select SYSTEM SETTINGS to set up the basic system information. Select PROGRAM SETTINGS to setup specific sampling routine information ➔ See SYSSET1 if SYSTEM SETTINGS ➔ See PROGSAM1 if PROGRAM SETTINGS ➔ See SPECOP 1 if SPECIAL OPTIONS

System Settings

IDENT	DISPLAY	ACTION / COMMENTS
SYSSET1	SELECT LANGUAGE ∗ ENGLISH [OTHER LANGUAGES]	Select the language of your choice ➔ See SYSSET2
SYSSET2	DATE/TIME 21-05-00 15:30	Set current time & date ➔ See SYSSET3
SYSSET3	DAYLIGHT SAVING ∗ NO [EUROPE]	Select the clock time mode for the Sampler: • NO – Clock time remains consistent through the year • EUROPE – Clock time changes to European Summer Time (forward 1hr at 01:00 last Sunday in March, back 1hr at 02:00 last Sunday in October) ➔ See SYSSET4

SYSSET4	SAMPLE TEMP LOG ∗ NO [STOP WHEN FULL] [ROLLING]	The Sampler is capable of logging sample temperatures when specified with Sample Temperature Monitoring (see MAINTENANCE for details of fault registration). There are 2 ways in which the Sample temperature data can be stored: • ROLLING – Where data will over write when the log is full, giving approximately the last 41 days of data for up to 70 days from running the program • STOP WHEN FULL – Where data will stop being stored when the log is full, giving the first 41 days of data only ➔ See SYSSET5
SYSSET5	LOW POWER MODE ∗ NO [YES]	When selected, in the absence of a button press (for approx. 70 seconds), the Sampler will enter a low power consumption mode. During this phase the LCD will switch off. Pushing any button will restore the LCD display. Notes: • LOW POWER MODE cannot be used when SAMPLING MODE is set to FLOW • LOW POWER MODE will disable the Sampler Warning Output ➔ See SYSSET6
SYSSET6	PPI MODE ∗ NO [YES]	The Sampler is capable of sampling from a pressurised effluent source when specified with the appropriate Pressurised Pipeline Interface / Connection ➔ See SYSSAM1
SYSSAM1	SAMPLER SETTINGS > > > > > > >	Information screen only ➔ See SYSSAM2
SYSSAM2	BOTTLER FITTED ∗ NO [YES]	The Sampler is capable of distributing samples into multiple bottles when specified with a Bottler ➔ See SYSSAM3
SYSSAM3	SHOTS/SAMPLE 01	The Sampler is capable of extracting larger volumes of wastewater by taking multiple consecutive 'Sample Shots' each time a 'Sample' is due ➔ See SYSSAM4
SYSSAM4	INITIAL SAMPLE ∗ YES [NO]	On 'Running' a program the first sample can be taken either immediately following the programmed 'START TIME' or be governed by the programmed 'TIME' or 'FLOW' interval NOTE: With a flow proportional sampling application 'INITIAL SAMPLE' would not normally be selected ➔ See SYSSAM5
SYSSAM5	SAMPLING MODE ∗ TIME [FLOW]	Samples can either be taken at fixed time intervals or, when coupled to a suitable flowmeter, in relation to flow ➔ See SYSSAM8 if TIME ➔ See SYSSAM6 if FLOW

SYSSAM6	FLOW ORIDE TIME ∗ DISABLED [ENABLED]	When working with a FLOW signal, a forced timed sample can be scheduled when insufficient effluent has passed to activate a sample on flow basis alone ➔ See SYSSAM7
SYSSAM7	FLOW SIGNAL ∗ 4/20mA [IMPULSE]	Sampler can accept either an impulse signal repeating at equal flow increments or an analogue 4/20mA signal corresponding to flow rate ➔ See SYSSAM8
SYSSAM8	REMOTE CONTROL ∗ NO [YES]	The sampling routine can be inhibited / enabled by an external signal. Each time a new REMOTE CONTROL signal is ON the sample routine will start, each time REMOTE CONTROL is OFF the sample routine will stop ➔ See SYSSAM9 if YES and sampling by TIME ➔ See SYSSAM10 if YES and sampling by FLOW ➔ See SYSSAM11 if NO
SYSSAM9	CONTROL MODE ∗ SAMPLER ENABLE [PUMP/TIME TRIG]	With SAMPLER ENABLE selected, the start time for timed samples will begin from zero each time REMOTE CONTROL signal is switched to ON. ➔ See SYSSAM10 With PUMP/TIME TRIG selected, the start time for timed samples begins when RUN PROGRAM is pressed and sample timing continually counts from this point irrespective of whether REMOTE CONTROL is ON or OFF ➔ See SYSSAM10
SYSSAM10	INITIAL DELAY 00HR 02MIN	A delay can be programmed in the Samplers recognition of the external signal. This delay is typically used when a pump is providing the control signal to allow the pump to establish a representative flow ➔ See SYSSAM11 if Bottler is not fitted ➔ See SYSSAM13 if Bottler is fitted
SYSSAM11	OVERFILL PROT ∗ NO [YES]	The number of sample shots can be limited, when using a single composite sample container to avoid overfilling ➔ See SYSSAM12 if YES ➔ See SYSSAM13 if NO
SYSSAM12	MAXIMUM SAMPLES 0100	Set maximum allowable number of samples ➔ See SYSSAM13
SYSSAM13	PRE PURGE 03 SEC	The time required, to expel the standing column of water in the submerged sample Intake Hose prior to the sample shot being collected The PRE PURGE time should be long enough to ensure that water is expelled from the Intake Hose followed by bubbles emitted from the end of the Intake Hose for approximately 2 seconds ➔ See SYSSAM14

SYSSAM14	POST PURGE 06 SEC	The time required, to expel the risen column of water from the submerged sample Intake Hose. The POST PURGE time should be long enough to ensure that water is expelled from the Intake Hose followed by bubbles emitted from the end of the Intake Hose for approximately 2 seconds ➔ See SYSSAM15
SYSSAM15	TIME OUT LIMIT 060 SEC	The period for which the Sampler will attempt to draw the effluent up the Intake Hose can be varied to suit the application. Maximum 199 seconds ➔ See SYSSAM16
SYSSAM16	SYSTEM SETTINGS INSTALLED	Information screen only ➔ See SETPROG if Bottler not fitted ➔ See SYSBOT1 if Bottler is fitted
SYSBOT1	BOTTLER SETTINGS > > > > > > >	Information screen only ➔ See SYSBOT2
SYSBOT2	BOTT LOCATIONS ∗ 24 [etc]	Set according to bottler format ➔ See SYSBOT3
SYSBOT3	RE-CYCLE ∗ NO [YES]	Bottler can either stop on last bottle or continue on to Bottle 1 and repeat its cycle continuously ➔ See SYSBOT4
SYSBOT4	BOTTLER MODE ∗ SINGLE [GROUP]	In SINGLE mode each bottle is addressed individually according to the program selected. In GROUP mode a nominally identical sample is deposited into each bottle of a group simultaneously* - Perhaps a bottle for each interested party, or possibly a separate bottle for each determinant (necessary where preservative dosing of the sample is required for example) ➔ See SYSBOT7 if SINGLE ➔ See SYSBOT5 if GROUP
SYSBOT5	BOTTLES/GROUP ∗ 2 [*other group sizes*]	Select number of bottles to be addressed simultaneously* (2, 3, 4, 6, 8, 12 or 24). This number must be a factor or equal to the number of specified bottle locations ➔ See SYSBOT6
SYSBOT6	BOT 15 SEC PAUS ∗ NO [YES]	To avoid residual effluent drops falling into a subsequent Bottle the Sampler can be programmed to hold the Distributor Pipe over each Bottle for 15 seconds following Sample Release ➔ See SYSBOT7
SYSBOT7	INCREMENT BY ∗ TIME [SAMPLES]	The Bottler can be programmed to advance bottles (or groups) either at regular time intervals or after a fixed number of samples ➔See SYSBOT8 if TIME and SAMPLING MODE is FLOW Otherwise: ➔See SYSBOT9

SYSBOT8	MAX SAMPS/BOTTLE 0005	Set maximum number of allowable samples per Bottle ➔ See SYSBOT9
SYSBOT9	BOTTLE CLEANING NO [YES]	Select this where a 2 x 4.5 litre Self-Emptying Self-Cleaning Bottler has been supplied with your S300 Sampler ➔ See SETPROG

Program Settings

IDENT	DISPLAY	ACTION / COMMENTS
PROGSAM1	SAMPLER SETTINGS > > > > > > >	Information screen only ➔ See PROGSAM2
PROGSAM2	START ROUTINE ∗ IMMEDIATELY [21-05-12 15:30]	Set a date / time for the sample routine to commence, or select IMMEDIATELY. If IMMEDIATELY is selected the sample routine will start at the time the RUN PROGRAM ► button is pressed ➔ See PROGSAM3
PROGSAM3	STOP ROUTINE ∗ NON STOP [22-05-00 15:30]	Set a date / time for the sample routine to stop, or select NON STOP ➔ See PROGSAM4 if time between START ROUTINE and STOP ROUTINE is less than 24 hours and both are within the same day ➔ See PROGSAM5 if SAMPLING MODE is TIME ➔ See PROGSAM6 if SAMPLING MODE is FLOW & IMPULSE ➔ See PROGSAM7 if SAMPLING MODE is FLOW & 4/20MA
PROGSAM4	REPEAT DAILY ∗ NO [YES]	If the duration of the sampling routine is less than 24 hours it can be repeated daily if required ➔ See PROGSAM5 if SAMPLING MODE is TIME ➔ See PROGSAM6 if SAMPLING MODE is FLOW & IMPULSE ➔ See PROGSAM7 if SAMPLING MODE is FLOW & 4/20MA
PROGSAM5	SAMPLE INTERVAL 00HR 01MIN	Set time between samples ➔ See PROGSAM9 if Bottler not fitted ➔ See PROGBOT1 if Bottler is fitted
PROGSAM6	IMPULSES/SAMPLE 0005	Set flow impulses between samples ➔ See PROGSAM9 if Bottler not fitted ➔ See PROGBOT1 if Bottler is fitted
PROGSAM7	INT AT FULLSCALE 001 MIN	Set required sample interval time when flow is at Full Scale i.e. 20mA ➔ See PROGSAM8 if FLOW OVERRIDE is ENABLED ➔ See PROGSAM9 if FLOW OVERRIDE is DISABLED

PROGSAM8	FLOW O/RIDE TIME 00HR 10MIN	Set the time after which a sample will be taken in a situation where the flow during that period has been insufficient to trigger one ➔ See PROGSAM8 if Bottler not fitted ➔ See PROGBOT1 if Bottler is fitted
PROGSAM9	PROGRAM SETTINGS INSTALLED	Information screen only ➔ See DEFAULT
PROGBOT1	BOTTLER SETTINGS > > > > > > >	Information screen only ➔ See PROGBOT2 if INCREMENT BY SAMPLES ➔ See PROGBOT3 if INCREMENT BY TIME
PROGBOT2	SAMPLES/BOTTLE 001	Set the number of samples to be deposited into each Bottle ➔ See PROGBOT4
PROGBOT3	TIME PER BOTTLE 00 HOURS 30 MINS	Set the time duration for which samples are to be deposited into each Bottle ➔ See PROGBOT4
PROGBOT4	PROGRAM SETTINGS INSTALLED	Information screen only ➔ See DEFAULT

Special Options Settings

Special Options is available for functions which are only required for specialised applications

IDENT	DISPLAY	ACTION / COMMENTS
SPECOP1	AUTO RESTART ✱ NO [YES]	The Sampler can be made to automatically restart its program after a power interruption (this option is not available when a Bottler is connected) ➔ See SPECOP2
*SPECOP2 **	SHOTS/BOTTLE(G) ✱ NO [YES]	The Sampler can be made to deposit individually designated numbers of sample shots into each bottle of a bottle array when in GROUP mode ➔ See SPECOP3
SPECOP3	SAMP ACQUIRED OP ✱ ON COMPLETION [DURING ATTEMPT]	'Sample Acquired' relay output can be programmed to operate in 2 ways: • ON COMPLETION – Closes on acquisition of a successful sample shot, at the end of the INTAKE phase *(SPOTSAM3)* • DURING ATTEMPT – Closes for the full duration of the sample shot attempt (whether successful or not), opening at the end of the POST PURGE phase (*SPOTSAM4)* ➔ See SPECOP4

SPECOP4	SAMP ACQUIRED OP ∗ DEFAULT LATCH [AUTO LATCH]	'Sampler Warning' relay output can be programmed to operate in 2 ways: • DEFAULT LATCH - The output will hold for 10 seconds only • AUTO LATCH – The output will hold for a preset time, or when i INFORMATION button is pressed ➔ See SPECOP5 if AUTO LATCH Otherwise: ➔ See SPECOP06
SPECOP5	AUTO LATCH TIME ∗ 00HR 00MIN 10SEC	Set the 'Sample Acquired' relay output latch time ➔ See SPECOP6
SPECOP6	SAMP WARNING OP ∗ DEFAULT LATCH [AUTO LATCH] [MANUAL LATCH]	'Sampler Warning' relay output can be programmed to operate in 3 ways: • DEFAULT LATCH - The output will hold for 10 seconds only • AUTO LATCH – The output will hold for a preset time, or when i INFORMATION button is pressed • MANUAL LATCH – The output will hold indefinitely until the i INFORMATION button is pressed ➔ See SPECOP7 if AUTO OFF Otherwise: ➔ See SPECOP08
SPECOP7	AUTO LATCH TIME 00HR 00MIN 10SEC	Set the 'Sample Warning' relay output latch time ➔ See SPECOP8
SPECOP8 **	SELECT ZONES ∗ SINGLE ZONE [MULTI-ZONE]	Set the number of sampling time zones: • SINGLE ZONE – Normal program settings (i.e. START on TIME/IMMEDIATELY and STOP on TIME/NON-STOP) • MULTI-ZONE – Program settings will request a start date/time and a stop date/time for each of the number of zones selected in SPECOP7 ➔ See SPECOP10 if SINGLE ZONE ➔ See SPECOP9 if MULTI-ZONE
SPECOP9	MULTI-ZONE #02 ZONES	Set the number of desired sampling zones (maximum 24) ➔ See SPECOP10
SPECOP10	WHEN BTL FULL ∗ WAIT FOR INTERVL [ADV TO NEXT BTL]	With a Bottler fitted, sampling by FLOW and advancing the Bottler by TIME, if high flowrate demands more samples than 'MAX SAMPLES PER BOTTLE' this option advances the Bottler to continue taking Samples within the 'TIME PER BOTTLE' period • WAIT FOR INTERVAL – Only one Bottle per 'TIME PER BOTTLE' period will be used • ADV TO NEXT BTL – Multiple Bottles per 'TIME PER BOTTLE' period will be used as Flow demands ➔ See SPECOP11

SPECOP11	SPECIAL OPTIONS INSTALLED	Information screen only ➔ See DEFAULT

* When SPECOP2 'SHOTS / BOTTLE' is selected 2 new screens will appear in the 'System Settings' > 'Bottler' menus, these are shown as follows:

IDENT	DISPLAY	ACTION / COMMENTS
SYSBOT4A	BOTTLES / GROUP ∗ 2 [other group sizes]	Select number of bottles to be addressed sequentially during each sample. This value must be a factor of the number of bottles locations ➔ See SYSBOT5A
SYSBOT5A	BOTTLE = 01 ∗ SHOTS = 02	Use ∗ to select the bottle number and input SHOTS = 02 a 2 digit number using the number keys to select the number of shots required to be deposited into each bottle of the bottle array ➔ See SETPROG

** When SPECOP8 'SELECT ZONES' is selected as 'MULTI-ZONE' the 'Program Settings' screen will change as follows as follows:

IDENT	DISPLAY	ACTION / COMMENTS
PROGSAM2X	START ZONE 01 [21-05-12 15:30]	Set a date / time for each of the sampling zones to start ➔ See PROGSAM3X
PROGSAM3X	STOP ZONE 01 [22-05-00 16:30]	Set a date / time for each of the sampling zones to stop ➔ See PROGSAM4 if total time between START zone 01 and STOP zone 24 (or last zone) is less than 24 hours and both are within the same day

Having selected one or more of the 'SPECIAL OPTIONS' the 'DEFAULT' screen will show a '+' positioned at the bottom left of the display.

Using INFORMATION i button

To assess the Program you have entered, or its progress, press the INFORMATION i button. The display will show as follows:

IDENT	DISPLAY	ACTION / COMMENTS
INFODEF	VIEW ∗ PROG SETTINGS [SHOT PROGRESS] [SAMPLE TEMP] [WARNING LOG] [SAMP/WARNING LOG] [EXIT]	Select YES to see options available or EXIT to return to default display. ➔ See INFO1 if PROG SETTINGS ➔ See INFO2 if SHOT PROGRESS ➔ See INFO3 if SAMPLE TEMP ➔ See INFO4 if WARNING LOG ➔ See INFO5 if SAMP/WARNING LOG ➔ See DEFAULT if EXIT

INFO1	START SAMPLING IMMEDIATE ↓ STOP SAMPLING NON-STOP ↓ SAMPLE INTERVAL OOHOURS 30MINS ↓ SAMPS/BOTTLE 001	Auto-scrolls though key Sampling Program settings ➔ See DEFAULT
INFO2	SHOTS ATTEMPTED 0048 ↓ SHOTS COMPLETED 0048	Auto-scrolls though key shot progress information ➔ See DEFAULT
INFO3	MAX SAMPLE TEMP = 4.0°C ↓ MIN SAMPLE TEMP = 1.0°C ↓ MEAN SAMPLE TEMP = 2.5°C ↓ PRESENT SAMPLE TEMP = 2.0°C	Auto-scrolls though key sample temperature data. This menu choice is only available if the Sampler is fitted with the Sample Temperature Monitoring Facility ➔ See DEFAULT
INFO4	0181 GUARD HIT 19:45 21-05-11 ⇕ ↓ 0295 TIME OUT 15:00 22-05-11 ⇕ ↓ etc.	Allows manual scrolling though all logged Warning Events. Each event has a unique 4 digit reference number, a short form description and a time and date of occurrence ➔ See DEFAULT
INFO5	0179 SAMPLE OK 19:15 21-05-11 ⇕ 0180 SAMPLE OK 19:30 21-05-11 ⇕ 0181 GUARD HIT 19:45 21-05-11 ⇕ ↓ 0182 SAMPLE OK 20:00 21-05-11 ⇕ ↓ etc.	Allows manual scrolling though all logged Sampling and Warning Events. Each event has a unique 4 digit reference number, a short form description and a time and date of occurrence ➔ See DEFAULT

The Event Log

The Samplers Event Log can contain up to approximately 1350 events. When these initially occur they will be momentarily displayed on the Samplers screen in the 'Full Form' format, but when being reviewed in the Event Log they will display in the 'Event Log Form' as shown in the table below.

The following table is a list of normal operational events which may appear in the Event Log, for all full set of Warnings event please see the Maintenance Section later in this User Guide.

FULL FORM MESSAGE	EVENT LOG FORM MESSAGE	ACTION / COMMENTS
INITIALISING	PRG START	Program has been initiated by pressing the ▶ RUN PROGRAM button
None	SAMPLE OK	Sample has been successfully acquired
None	ZONE STA 01	Start of zone
None	ZONE END 01	End of zone
INCREMENTING BOTTLER	INC BOTTLER	Bottler has moved to its next location after programmed time / number of samples
None	REM I/P ON	The external Remote Control input has closed
None	REM I/P OFF	The external Remote Control input has opened
PROGRAM COMPLETE	PRG COMPLET	Program has completed
STOP BUTTON PRESSED	STOPPED	Program has been stopped by pressing the ■ STOP button

Running a Program

To run your program, press the RUN PROGRAM ▶ button. On doing this the following screens will appear:

IDENT	DISPLAY	ACTION / COMMENTS
RUNPROG1	TESTING BOTTLER PLEASE WAIT	Only appears where Bottler is specified in SYSTEM SETTINGS
RUNPROG1	PROGRAM RUNNING 19-02-11 10:35	Shows current status and date / time
RUNPROG3	NEXT SAMPLE DUE 00HR 09MIN 34SEC	Indicates when next sample is due
RUNPROG4	BOTTLE INC. IN 00HR 19MIN 34SEC	Only appears where Bottler has been successfully detected in RUNPROG1 Indicates when next Bottler increment is due

In addition to the above status displays the Sampler will also display warning messages relating to any events which may have occurred during the program. Warning messages are displayed every few seconds and are accompanied by a bleep sound. When the program has completed the display will show:

PROGRAM COMPLETE or MAXIMUM SAMPLES REACHED

Data Connection

The Sampler's event log and optional temperature log can be downloaded via the optional Data Connection to a suitable computer / handheld communication device

The event log can store up to approx. 1350 events, including Sample Shots, Bottler increment events, external signal events etc. and approx. 12,000 Sample Temperature records. Samplers with the Data Connection fitted can be allocated a user defined tag / name

Communicating via the Data Connection

The following assumes that the computer has a suitable serial port communication program installed (such as HyperTerminal). Proceed as follows:

1. Connect the USB cable to the Sampler on the front panel
2. Connect other end of the USB cable to communications port (COMX) on computer
3. Power up computer and Sampler
4. Open a suitable serial port communication program (such as HyperTerminal) on the Computer
5. Set the Computer port properties as follows (settings may vary dependant on communications program):

Bits per second	19,200
Data bits	8
Parity	None

Stop bits 1
Flow control None

6. Set the Computer ASCII Setup as follows:
   Append line feeds to incoming line ends
   Wrap lines that exceed terminal width
   Emulation set to 'Auto detect'
7. Communication with the Sampler should now be possible

The Sampler can receive 7 control codes from the Computer, these are:

CODE	COMMENTS
✳s*[tagname]*	Where [*tagname*] is a user definable tag / ID (up to twenty ASCII characters long) Example: ✳sSAMPLER_123 then carriage return gives the Sampler the name SAMPLER_123
✳i	Shows basic Sampler information plus the full list of control codes: ✳i Unit = SAMPLER_123 Date: 21-05-19 Time 15:30 Sampler firmware: SXX.XX.XX.XX Temperature Correction = 0.0 C Command list: *i - Download Information *e - Download Event Log *w - Download Warning Log *t1 - Download Temperature Log in Spread Sheet Format *t2 - Download Temperature Log in Visual Appraisal Format *s - Change unit name *c - Cancel download
✳e	Calls the full Event Log from the Sampler If the logger contains 150 or more events, the computer will show:

```
*e
Unit = SAMPLER_123
Date: 21-05-19 Time 15:30
Sampler firmware: SXX.XX.XX.XX
EVENT LOG
Record Count = XXXXX
Approximate download time = XXX to XXX sec
Press the '1' button on the Sampler to continue with the download
Press the '2' button on the Sampler to abandon the download
The Sampler is waiting for response...
```

and the Sampler LCD will show:

```
[1] TO DOWNLOAD
[2] TO ABANDON
```

Press the 1 button on the Sampler to continue with the download

The Sampler LCD will show:

```
DOWNLOADING
```

When the download is complete, the screen returns to the DEFAULT

Note: If the logger contains less than 150 events the above choice will not be given and the download will automatically continue

***w**

Calls the Warning Log from the Sampler

The computer will show:

```
*w
WARNING LOG
Record Count = 00001
21-05-19 15:35, 0003 SHOT T/OUT, (for example)
Download Complete
```

***t1**

Calls the Temperature Log from the Sampler in spread sheet format suitable for transferring into a Spreadsheet on a Computer

The computer will show:

	∗t1 NOTE: Temperatures are logged at 5 minute intervals Enter ∗c to cancel the Download Approximate download time = 001 to 002sec SAMPLE TEMPERATURE LOG Spread Sheet format selected… Temperature Correction = 0.0 C Record Count = XXXXX DOWNLOADING Start Date: 21−05−19 Time 15:30 Maximum Sample Temp = 3.0 C Minimum Sample Temp = 3.0 C Mean Sample Temp = 3.0 C 00001, 21−05−19 15:35, 3.0 00001, 21−05−19 15:40, 3.0 *[more temperatures etc.]* Download Complete
∗t	Calls the Temperature Log from the Sampler in visual appraisal format suitable for viewing directly in the download The computer will show: ∗t2 NOTE: Temperatures are logged at 5 minute intervals Enter ∗c to cancel the Download Approximate download time = 001 to 002sec SAMPLE TEMPERATURE LOG Spread Sheet format selected… Temperature Correction = 0.0 C Record Count = XXXXX DOWNLOADING Start Date: 21−05−19 Time 15:30 Maximum Sample Temp = 3.0 C Minimum Sample Temp = 3.0 C Mean Sample Temp = 3.0 C 21−05−19 15:35 3.0, 3.0, 3.0, 2.9, 2.9. 3.0, *[more temperatures etc.]* Download Complete
∗c	Instructs the Sampler to cancel the current download. Once a download has started, if taking too long entering ∗c will cancel that download

5 MAINTENANCE

General

Routine user maintenance on your Aquacell Sampler is made as minimal as possible. It is however strongly recommended that regular preventative maintenance is carried out by an Aquamatic Certified Engineer. Please contact Aquamatic offices for details of annual Maintenance Contracts under which this work can be carried out

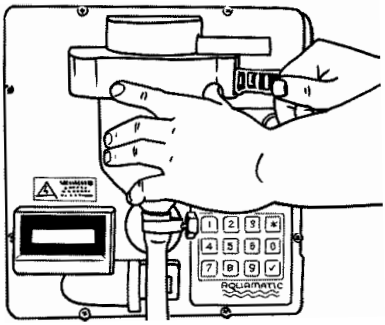
It is good policy to maintain the Sampler and its accessories in a generally clean condition bearing in mind the potential infection hazards associated with wastewater

NOTE: Suitable PPE must be worn when handling / cleaning your Aquacell Sampler

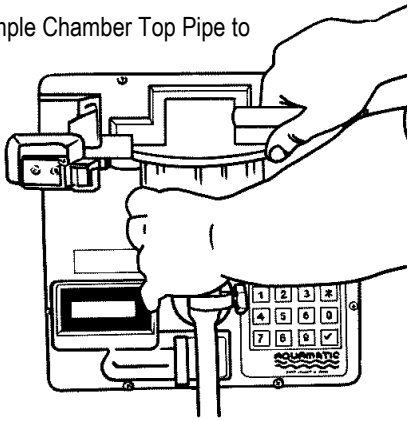
Removing / Refitting the Sample Chamber

Removing and refitting the Sample Chamber is necessary when carrying out a number of different operations. It is therefore useful to become familiar with this simple operation

1. Remove Intake Hose
2. Release retaining clip at right side of Top Clamp



3. Hinge open Top Clamp whilst gripping Sample Chamber Top Pipe to ensure Sample Chamber stays in place
4. Gripping Sample Chamber Top Pipe with one hand and Sample Chamber with the other carefully release the assembly from the Top Clamp
5. Carefully remove the Sample Chamber Top assembly from the Sample Chamber assembly using the top pipe as a lever
6. Carry out the above procedure in reverse order to replace the Sample Chamber



Cleaning Sample Tract (Intake Hose and Sample Chamber)

With all Aquacell Sampler models, in the interests of minimising sample contamination the Sample Tract (Intake Hose and Sample Chamber) should be kept clean. The method adopted to clean the sample tract will depend on how sensitive the application is to cross contamination

Most parts of the sample tract are easily accessible and can be cleaned with a detergent and / or a cream cleaner such as 'CIF' using a suitable brush

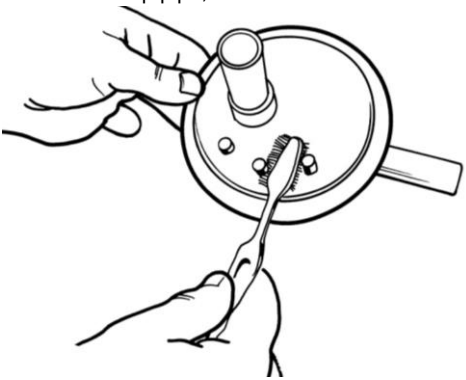
Inaccessible parts of the sample tract are usually flushed out with clean water. Where the Sampler has to be completely free from the contamination of previous sampling operations then replacement of inaccessible parts is the only option

The frequency of cleaning will depend very much on the application. Operational experience with the Aquacell Sampler will enable you to decide how frequently the sample tract should be cleaned in order to ensure that reliable and representative samples are always collected

The parts of the sample tract which need to be kept clean are as follows:

- Intake Hose assembly – Loosen hose clamp to remove. Either flush out with clean water or replace
- Sample Chamber / Chamber Top
  When cleaning the Sample Chamber Top it is important to ensure that the inside surface, particularly between the electrode pins, is kept free of wastewater contamination. Wastewater deposits can form a conductive path between the electrode pins which may lead to the occurrence of CLEAN CHAMBER TOP and / or GUARD PROBE HIT faults. A test for conductive build-up on the Sample Chamber Top is detailed in the 'Test Mode' later in this section
  a) To clean the Sample Chamber Top firstly remove the Sample Chamber assembly as detailed in 'Removing / Refitting the Sample Chamber' earlier in this section
  b) Clean the Sample Chamber with a cleaning sponge using a detergent solution followed by a clean water rinse. Stubborn deposits may require a more aggressive cleaner

c) Clean the sample Chamber Top in a similar manner but using brushes instead of a sponge. A small diameter bottle brush or similar can be used to clean the inside of the horizontal top pipe, and the silicone Volume Control Tube



d) A small toothbrush (or similar) can be used to reach the base of the 3 electrodes and the inside surface of the Chamber Top between the electrodes. Clean the 3 electrodes both above and below the Chamber Top

e) Once cleaned retest the Sample Chamber Top to ensure that any conductive path is removed as detailed in the 'Test Mode' sub section later in this section

- Sample Collection Vessel - The method used to clean the Sample Collection Vessel will vary depending on which format is purchased:

2.5 / 5 / 10 litre HDPE Bottles

Clean with a brush using detergent solution, followed by a clean water rinse

25 litre Polyethylene Container

Remove the central access disc for cleaning. Clean with a brush using detergent solution, followed by a clean water rinse

0.75 litre Glass Bottles

Either clean in a bottle washer or replace

1 litre P.E.T. Bottles

Either flush with clean water or replace

1 litre Polypropylene Containers

Clean with a brush using detergent solution followed by a clean water rinse

Bottler Distributor Pipe

Force the Distributor Pipe out of its white retaining clip. Clean with a brush using detergent solution, followed by a clean water rinse

Changing Desiccant Bag

It is important to ensure that electronic / electrical hardware inside the sealed Sampler Module remains dry. As such periodically it may be necessary to change the Desiccant Bag inside your Aquacell Sampling Module. To do this proceed as follows:

- Switch off and isolate the Sampler module
- Remove Sample Chamber / Top assembly (see removing / refitting the Sample Chamber)
- Remove rubber Desiccant Bag access plug from Sampler Module Front Panel
- Withdraw Desiccant Bag and discard in suitable waste disposal bin
- Remove new Desiccant Bag from its sealed bag and push into Front Panel
- Replace the rubber Desiccant Bag access plug

Lubricating Pinch Valve Piston

Occasionally it may be necessary to lubricate the Pinch Valve Piston, this should be carried out using the appropriate lubricant as follow *:

- For 'Pinch Valve Piston – Series 2' (black) use 'Silicone Grease – 25g' (CL-6179) *
- For 'Pinch Valve Piston – Series 1' (red) use 'Pinch Valve Grease – Series 1 – 25g' (CL-6140) *

* Caution – Using the incorrect grease is likely to cause damage to the Sampler Module

A small deposit of grease should be applied to the Pinch Valve Piston shaft and spread over the working surfaces by manually moving it in and out

Trouble Shooting

If your Sampler is not operating correctly check the symptoms against the following list. If you are unable to remedy the problem then refer back to Aquamatic Ltd or your local dealer (see Service Support section for details)

General Operational Troubleshooting

SYMPTOM	FAULT	ACTION / COMMENTS
1. No Display	a. Power off	a. Connect power
	b. Electronic fault	b. Contact supplier for service advice
2. Reduced sample lift capability / transport velocity	a. Partially blocked sample tract	a. Clean sample tract
	b. Leaking top clamp pneumatic connector	b. Replace 'O' ring, stub pipe
	c. Leaking Chamber Top seal	c. Replace 'O' ring, Chamber Top
	d. Leaking pinch valve (bubbles rising through pinch valve tube)	d. Change pinch valve tube N.B. Often a new pinch valve tube will need to undergo several sample cycles before it seals properly
	e. Leaking intake hose, or intake filter connection (excessive bubbles entrained in water entering sample chamber)	e. Check connections and seal
	f. Pump inefficiency	f. Contact supplier for service advice
	g. Internal pneumatic fault	g. Contact supplier for service advice
3. Sample shot sequence error	a. Purge times are incorrectly set	a. Check purge times and reset if necessary
	b. Internal pneumatic / electronic fault	b. Contact supplier for service advice
4. Samples not being kept at required temperature (P2-COOLBOX only)	a. Cooling Elements spent	a. Re condition Cooling Elements as per 'Section 3 Installation' in this User Guide
	b. COOLBOX lid seal damaged	b. Contact supplier for service advice

Sampler Warning Message Troubleshooting

When Warnings initially occur a warning message will be momentarily displayed on the Samplers screen in the 'Full Form' format (see table below), when being reviewed in the Event Log they will display in the 'Event Log Form'. If a Warning occurs whilst a program is not running the message will only appear temporarily on the Sampler screen

MESSAGE	CONDITION	ACTION / COMMENTS
1. Display shows: Full Form: FAULT Event Log Form: OPEN CIRCT PROBE OPEN CIRCT and sample shot cycle aborts **Notes:** • This fault will not cause the program to abort. It will, however, prevent a program being initiated	a. Chamber not fitted b. One or more contact springs in front panel sample chamber assembly recess not connecting to its respective electrode c. Electronic fault	a. Fit chamber b. Clean tops of electrodes where contact is made with contact springs. See Cleaning Sample Tract / Stainless Steel Electrodes earlier in this Section N.B. Contacts springs should project about 6mm from their location holes c. Contact supplier for service advice
2. Display shows: Full Form: FAULT – CLEAN CHAMBER TOP Event Log Form: CLEAN CHTOP and sample shot cycle aborts **Notes:** • This fault will not cause the program to abort. It will, however, prevent a program being initiated	a. A conductive path is present between the 'common' central Level Sensing Probe and either one or both of the other two Level Sensing Probes prior to commencing the sample intake phase. This is probably due to effluent build up resulting from splashing during the intake phase b. Electronic fault	a. Clean Chamber Top. See Cleaning Sample Tract / Stainless Steel Electrodes earlier in this Section Review Sampler installation to ensure splashing does not occur during the intake phase. See Installation Section of this User Guide b. Contact supplier for service advice
3. Display shows: Full Form: FAULT Event Log Form: GUARD HIT GUARD PROBE HIT but sample shot cycle continues normally **Notes:** • This fault will not cause the program to abort. It will, however, prevent a program being initiated	a. Sample induction phase is terminated by short guard probe because long probes have become insulated due to contamination build-up b. Sample induction phase is terminated by short guard probe because wastewater is entering the Sample Chamber in a turbulent manner causing random triggering due to splashing	a. Clean Chamber Top. See Cleaning Sample Tract / Stainless Steel Electrodes earlier in this Section b. Check for air leaks in the Intake Hose. Ensure Intake Hose Filter is fully submerged in effluent channel

4. Display shows: Full Form: FAULT Event Log Form: LOW VOLTS LOW VOLTAGE and a shot is not acquired **Notes:** • This fault will not cause the program to abort	Supply voltage below minimum threshold	Restore adequate supply voltage
5. Display shows: Full Form: FAULT Event Log Form: SHOT T/OUT SHOT TIMED OUT and a shot is not acquired **Notes:** • This fault will not cause the program to abort	a. Intake filter is out of source effluent b. Channel is dry c. Blocked sample tract d. See Symptom 2 in 'General Operational Troubleshooting' table earlier in the Section	a. Ensure Intake Filter is fully immersed. See Installing Intake Hose (See Operation Section) b. Ensure effluent is present in channel whilst Sampling is in operation c. Clean Sample Tract (see Cleaning Sample Tract / Stainless Steel Electrodes earlier in this Section) d. No further action
6. Display shows: Full Form: FAULT Event Log Form: BOTT FITTED BOTTLER FITTED and a program is aborted	Bottler is connected to the Sampler but not specified in the program settings	Disconnect Bottler or reprogram Sampler
7. Display shows: Full Form: FAULT Event Log Form: BOT MISSING BOTTLER MISSING and a program is aborted	Bottler is not connected to the Sampler but is specified in the program settings	Ensure Bottler is fully connected to Sampler then recheck If fault persists contact supplier for service advice
8. Display shows: Full Form: FAULT Event Log Form: BOTT FAULT BOTTLER FAILED and a program is aborted	Sampler is not receiving correct signals from Bottler	Ensure Bottler is fully connected to Sampler, then recheck If fault persists contact supplier for service advice
9. Display shows: Full Form: FAULT - SAMPLE TEMP SENSOR Event Log Form: TEMP SNSR X and program is aborted	a. Temperature Sensor is not connected to the Sampler but is specified in the program settings b. Electronic fault	a. Connect Temperature Sensor or reprogram Sampler b. Contact supplier for service advice
10. Display shows: Full Form: FAULT - SAMPLE TRACT BLOCKED Event Log Form: TRACT BLKD and Sample is aborted	Some part of the Sample Tract is blocked causing an over pressure in the Sample Chamber during a pre or post purge	Check and remove any blockages from: • Intake Hose • Sample Chamber Top • Top Clamp breather orifice

11. Display shows: Full Form BACK-UP BATTERY IN OPERATION	Event Log Form B BCK-UP ON	Appears where main power is lost with a Sampler being operated on mains with a float charged Back-Up battery option	Restore mains power supply
12. Display shows: Full Form MAINS POWER RESTORED	Event Log Form PWR RESTORD	Appears where main power is restored with a Sampler being operated on mains with a float charged Back-Up battery option	None
13. Display shows: Full Form	Event Log Form WARN LATCH	A Sampler Warning has occurred and Special Option LATCH WARNING OP is set for AUTO OFF or MANUAL	None
14. Display shows: Full Form	Event Log Form WARN T/OUT	A latched Sampler Warning has automatically timed out	None
15. Display shows: Full Form	Event Log Form WARN DISAB	A latched Sampler Warning has been manually disabled	None

Test Mode

The Sampler has a Test Mode which is very useful in helping to diagnose fault conditions both within the Sampler and in its peripheral equipment. The Test Mode can also be useful during the commissioning of a Sampler

Use '∗' button to step from one test to the next. To return to the normal operating mode press 'SET PROG' button

DISPLAY	COMMENTS
AQUACELL READY	Press and hold 'STOP' button to enter Test Mode
total shots 0000000001	Records total number of sample shots taken by the Sampler since its date of manufacture. This display only shows briefly	0000000001
test pump ∗ [test finished]	Press ✓ button to exercise pump. Listen for uneven running or any spurious noises
test level det ∗ 0514 [test finished]	Press ✓ button to check main level probe Reading should be in the range 0507 to 0517 A reading below this range suggests that a conductive path exists between the 2 long electrodes. This probably means that the inside of the Sample Chamber Top needs cleaning A reading above this range suggests a bad contact between one or more of the spring contacts and its corresponding electrode

test guard elec ✳ 0515 [test finished]	Press ✓ button to check guard level probe Reading should be in the range 0507 to 0517 A reading below this range suggests that a conductive path exists between the centre electrode and the short electrode. This probably means that the inside of the sample Chamber Top needs cleaning A reading above this range suggests a bad contact between one or more of the spring contacts and its corresponding electrode
test pwr supply ✳ 12.10 [test finished]	Press ✓ button to check power supply under load On DC power reading should be in the range 11.00 to 12.25 On AC power reading should be in the range 11.30 to 13.50
test sv valves ✳ [driving valve 1] [driving valve 2] [driving valve 3] [test finished]	Press ✓ button to check solenoid valves 1 to 3 in turn Listen for 3 clicks as valves automatically energise in turn
test acquired op ✳ [test finished]	Press ✓ button to drive the Sample Acquired output Contact closure should be detected on yellow and brown cores of Ancillary Signal Cable
test warning op ✳ [test finished]	Press ✓ button to drive the Sampler Malfunction output Contact closure should be detected on white and violet cores of Ancillary Signal Cable
test bottler ✳ [test finished]	Press ✓ button to drive Bottler around to 'Bottle 1' position When the Bottler reaches the 'Bottle 1' position the display will show: 'bottler homed✳' then 'test finished' If the bottler is not operating correctly (or is not connected) the display will show: 'BOTTLER FAILED✳' then 'test finished'
test impulse ✳ 00001 [test finished]	Press ✓ button to show impulse counter Providing a contact closure between red and black cores on Ancillary Signal Cable should increment counter
test 4-20 loop ✳ 0001 [test finished]	Press ✓ button to show 4-20mA input signal representation Feeding 4-20mA current signal via blue core (positive) and red core (negative) on Ancillary Signal Cable should display readings within the following ranges: 4mA (no flow) 0808-0828 12mA (half scale flow) 0399-0419 20mA (full scale flow) 0000-0010
test remote in ✳ input open [input closed] [test finished]	Press ✓ button to show remote input display Contact closures between green and black cores on Ancillary Signal Cable should switch display
temp correction ✳ 24.0ºC [test finished]	Press ✓ button to show temperature probe correction screen With Temperature Probe immersed in a liquid, the temperature of which is monitored by a calibrated thermometer, adjust the Samplers displayed reading to match. Press button 2 ▲ to increase and button 8 ▼ to decrease reading

Service Support

There are no user serviceable parts on the Aquacell apart from those mentioned above. In the event of failure of a Sampler the following procedure should be carried out:

1. Report the failure to Aquamatic Ltd or its approved distributor. Often a telephone call is enough to resolve a perceived problem
2. When a problem cannot be resolved over the telephone then the faulty item must be returned to Aquamatic Ltd or an approved distributor as soon as possible. Proceed as follows:

Returning a Sampler

a. Remove Sampler unit from its mounting / base
b. Do not return the battery (if supplied) with the Sampler unless requested
c. Do not remove the Sample Chamber assembly from the Sampler
d. Pack the Sampler unit (and Battery [separately] if requested) in the original packaging if possible. If original packaging materials have been discarded please contact your supplier who will arrange for a new transit pack to be forwarded to you
e. Return to Aquamatic Ltd or it's approved distributor, for repair

Returning a Bottler

a. Pack the Bottler in original packaging materials if possible. If original packaging materials have been discarded please contact your supplier who will arrange for a new transit pack to be forwarded to you
b. Return to Aquamatic Ltd or it's approved distributor, for repair

Returning other hardware

Either pack in original packaging if available, or use suitable alternative packaging materials

NOTE: For all equipment being return to Aquamatic a Decontamination Certificate must be completed. This will be issued by Aquamatic on or before receipt of the equipment

Please ensure that all items are packed securely such that movement within the box is prevented during transit. Repair of transit damage is chargeable

6 TECHNICAL SPECIFICATION

Operation / Performance

General usage	Aquacell Wastewater Samplers are NOT suitable for use in areas which have been classified as ATEX hazardous zones
Sample media suitability	Non-pressurised wastewater (unless specified with Pressurised Pipeline Interface)
Sample extraction method	Air pump vacuum system
Operating modes	Time 1 min to 100 hour sampling interval Flow Volt-free impulse or 4-20mA Event Externally triggered e.g. by pH meter
Maximum lift height	> 7 metres
Transport velocity	On Mains AC = 0.5 m/s average over 7m On 12VDC = 0.5m/s average over 5m
Sample shot volume range	30-500ml (30-100ml when used with 12 Bottle Removable Bottlers, 30-300ml with PPI)

NOTE: Minimum volume may vary subject to application and Sample Chamber Top configuration

Sample shot cycle time	Approx. 30 seconds (with 4 metres lift)
Data logging	Up to 1350 events can logged and viewed on the Samplers LCD or downloaded via the optional Data Connection (CL-4006). Sample temperature can also be logged / downloaded when an optional Sample Temperature Monitoring connection is specified
Intake Hose	2m flexible braided PVC hose with Stainless Steel Intake Filter incorporating 5 x Ø12mm intake ports 2m Intake Hose Extensions as required
Intake Hose purging	Air / residual effluent purging before and after sample intake
Sample tract diameter	12mm increasing to 16mm (22mm when bottler is in use) between sample intake and sample discharge
Maximum sample media temperature	60°C

Control panel: 17 button keypad. Alpha numeric LCD

Humidity control Desiccant Bag with graduated Humidity Indicator visible on Front Panel

Sample Collection Vessel availability

Aquacell P2-COMPACT	1 x 5 litre MDPE Container
Aquacell P2-COOLBOX	1 x 5 litre HDPE Container
Aquacell P2-MULTIFORM	1 x 25 litre MDPE Container 12 x 0.75 litre Glass Bottler 12 x 1 litre P.E.T. Bottler 24 x 1 litre HDPE Bottler

Note: Contact re-seller for full current list of options

Security Various locking points provided such that when secured with optional Security Padlock – All Weather (CL-4055) the Sampler is rendered tamper-resistant

Ingress Protection Rating (with Front Cover closed)

Aquacell P2-COMPACT	IP65
Aquacell P2-COOLBOX	IP65
Aquacell P2-MULTIFORM	IP65

Ambient temperature operating range

Aquacell P2-COMPACT	-10°C to 50°C (no sample frost protection)
Aquacell P2-COOLBOX	-10°C to 50°C
Aquacell P2-MULTIFORM	-10°C to 50°C (no sample frost protection)

Sample temperature control (0-5°C)

Aquacell P2-COOLBOX	2-5 days @ 15°C ambient temperature

Mechanical

Dimensions

Aquacell P2-COMPACT	H430mm x W320mm x D375mm
Aquacell P2-COOLBOX	H835mm x Ø430mm
Aquacell P2-MULTIFORM	H650mm x Ø445mm with 25 litre Container H780mm x Ø445mm with Bottler

Freezer - Standard H902mm x W540mm x D635mm
(Optional Equipment for P2-COOLBOX)

Freezer - Bulk H965mm x W1280 x D655mm
(Optional Equipment for P2-COOLBOX)

Weight (excluding Power Option / Sample Collection Vessel)

Aquacell P2-COMPACT	7.3Kg
Aquacell P2-COOLBOX	5.0Kg + 12.5Kg COOLBOX Base
Aquacell P2-MULTIFORM	8.5Kg

Typical Optional Equipment:

Integral Battery	2.7kg
Mains Connection	1.6kg
Bottler (24x1 HDPE inc Bottles)	6.4kg

Key materials of construction (standard setup)

Sample Chamber	Acrylic (Glass optional)
Sample Chamber Top	Polypropylene, Silicone rubber, UPVC, Stainless Steel
Sample Collection Vessels	Various materials: HDPE, MDPE, P.E.T., Glass (see Sample Collection Vessels above)
Intake Hose with Filter	PVC with Polyester braid hose, Stainless Steel Intake Filter
Sampler Module	Polyurethane plastic casing mouldings, Polypropylene cover, Stainless Steel, hardware - EEE
Sampler Support Frame	Tubular Aluminium frame, Polypropylene base
Insulated Base (P2-COOLBOX)	MDPE, Polyurethane foam, tubular Aluminium, Stainless Steel hardware
Cooling Elements (P2-COOLBOX)	LDPE, Water filled
Bottler Distributor Unit	Acrylic dome, Polyurethane, Brass, Stainless Steel hardware - EEE
Bottle Carrier (24x1 formats)	Polypropylene, Nylon 6-6, UPVC, Stainless Steel hardware
Bottle Distribution Tray (12x1 formats)	Polypropylene, UPVC, Nitrile rubber, Stainless Steel hardware

Power Supply

Power options

Mains AC	110/120/220/230VAC @ 50/60Hz
Mains AC (as above) with Integral Float Charge Backup Battery	As above + 12VDC 7Ah Sealed Lead Acid Battery
Integral Battery (only)	12VDC 7Ah Sealed Lead Acid Battery
Separate 12VDC Battery Connection	12VDC (Suitable 12VDC Lead Acid Battery supplied by Customer)

Power consumption

Mains powered Samplers	60VA @ 110/230V / 50Hz
Battery powered Samplers	12V @ 5A max
Quiescent current	LOW POWER MODE 'on' = 3mA (approx.) LOW POWER MODE 'off' = 55mA (approx.)
Battery consumption / sample shot	0.0205Ah (approx. with 3m lift)

Optional Connections / Equipment

Ancillary Signal Connection

Remote control input	Inputs should be 'Normally Open' volt free Minimum contact closure period >50ms
Analogue flow input	4-20mA into 255Ω
Digital pulsed flow input	Inputs should be 'Normally Open' volt free Minimum contact closure period >30ms followed by minimum opening period of >20ms
Sample acquired output	Normally open volt free contact (50VDC 1A). Contact closes when sample medium bridges level probes in Sample Chamber
Sampler malfunction output (not available in 'LOW POWER MODE')	Normally open volt free contact (50VDC 1A). Contacts held closed when system is powered and healthy. Contacts open when one or more of the following warning conditions occur:

1. Probe open circuit
2. Chamber Top is contaminated
3. Guard probe hit
4. Low supply voltage
5. Intake phase is timed out
6. Bottler is fitted but sampler is programmed for no Bottler
7. Bottler is not fitted but sampler is programmed for Bottler
8. Temperature Sensor (when optional Temperature Sensor is fitted)
9. Bottler failed
10. Power supply failed (where there is no Battery backup)
11. Ancillary signal cable open circuit
12. Sample Tract is blocked (when Blockage Detection System option is fitted)

Data Connection output Requires Data Connection (CL-4006)	USB cable A-B connecting to suitable USB COM port. Requires serial port PC communication software

Disposal

In the event that this equipment is being disposed of particular reference should be made to the 'Key Materials of Construction' earlier in this section. All parts must be disposed of in line with current UK regulations

Electrical and electronic equipment (EEE) contains materials, components and substances that can be dangerous and harmful to human health and the environment if the waste (WEEE) is not disposed of properly

Products that are labelled with a 'crossed-out wheelie bin' are electric and electronic equipment. The crossed-out wheelie bin symbolises that waste of this type cannot be disposed of with unsorted waste, but must be disposed of separately

Standards Compliance

UK Environment Agency Standard

MCERTS Performance Standard for Continuous Water Monitoring Systems – Automatic Water Sampling Equipment Part 1

European Standard

EN16479:2014 Water Quality – Performance requirements and conformity test procedures for water monitoring equipment – Automated sampling devices (Samplers) for water and wastewater

UK Regulations

The fulfilment of the requirements set out in Schedule I of the **Electromagnetic Compatibility Regulations 2016** has been demonstrated, having applied the following standards:

BS EN 61000-6-3:2007
Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments

BS EN 61326-1:2013
Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements

The fulfilment of the safety objectives for equipment referred to in Part 1.3 and set out in Schedule I of the **Electrical Equipment (Safety) Regulations 2016** has been demonstrated, having applied the following standards:

BS EN 61010-1:2010
Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements

It has been demonstrated that the requirements specified in **The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012** has been met

EU Directives

The fulfilment of the requirements set out in Annex I of the **Electromagnetic Compatibility Directive (EMC) 2014/30/EU** has been demonstrated, having applied the following standards:

BS EN 61000-6-3:2007
Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments

BS EN 61326-1:2013
Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements

The fulfilment of the safety objectives referred to in Article 3 and set out in Annex I of the Low Voltage Directive (LVD) 2014/35/EU has been demonstrated, having applied the following standard:

BS EN 61010-1:2010
Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements

It has been demonstrated that the requirements specified in Article 4 of the **Restriction of Hazardous Substances Directive (RoHS) 2011/65/EU** has been met

ISO International Standard

Generally in accordance with:

ISO 5667–10 : 1992
Water quality - Sampling: Guidance on sampling of waste waters

European & International Standards

See Operation / Performance Section for ratings:

EN 60529 : 1992 + A2 : 2013
IEC 60529 : 1989 + A2 : 2013
Degrees of protection provided by enclosures (IP Code)

AQUA CELL

Established in 1991, Aquamatic Limited is a leading manufacturer of automatic Wastewater Sampling Equipment, based in Manchester, United Kingdom. The company and its product range benefit from over 50 years experience in the wastewater sampling industry

From the outset the Aquamatic philosophy has been to focus strictly on the design and manufacture of uncomplicated, robust and reliable wastewater sampling equipment. By remaining committed to this goal, Aquamatic now offer a true leading edge range of products suitable for the worldwide market

Available both direct from Aquamatic in England and around the world via a network of local distributors, Aquamatic equipment is accessible globally to any company with a requirement for high quality, dependable wastewater sampling equipment

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