

# ***Aqua-Recycling-Control***

## ***Greywater Recycling System***



# Greywater Recycling

## Introduction

Water, or the lack of water, is becoming an ever increasing issue in the UK and needs to be addressed as a matter of urgency. Climate change, over extraction of water resources and population growth are largely to blame for the current and future areas of water stress in the UK. Indeed, we are seeing an increasing use of Hosepipe Bans being implemented by a number of Water Companies in the UK as part of the measures to combat this very real problem.

We have a plentiful supply of water that could be used - from the roofs of our buildings or the waste from our baths and showers

Why not make use of them?



### Great benefits with little effort:

- Saving mains water and sewage charges
- Mains water savings independent of the weather
- Quick financial returns compared to other renewable technologies
- Long storage periods of treated water
- Combinable with rainwater harvesting
- Little space requirements due to compact systems
- Adoptable to every type of building due to modular based above or below ground systems
- No use of chemicals
- Enhanced Capital Allowance applicable via Water Technology List.
- Complies to BREAAAM, LEED, CFSH requirements

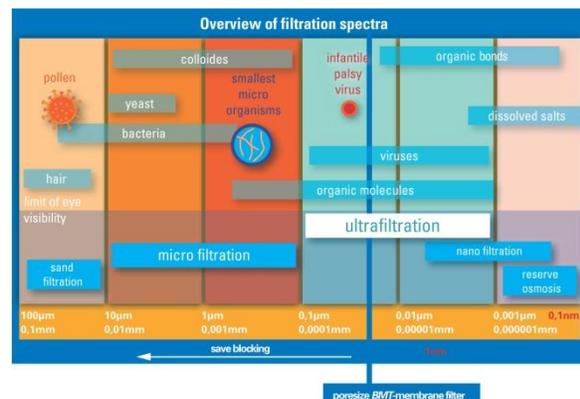
### Best water quality due to most modern BioMembrane Technology

The chemical free treatment process is using the latest technology and safest water treatment method for greywater recycling: Bio-Membrane-Technology (BMT). The membrane has a 38nm filter pore size.

Every Membrane pore is 2.500 times finer than the human hair and therefore creates an impassable barrier for every particle and even bacteria. After treatment the water is available again as clean, clear, odorless and germfree non-potable water.

### The treated greywater complies with:

- British Standard BS8525-1:2010
- European Bathing Water Regulation 2006/7/EG



# AQUALITY'S Aqua-Recycling-Control

Space saving, highly efficient, modular system

- 1) Coarse filter**  
with back wash facility
- 2) Greywater buffer tank**  
collects the incoming water for treatment
- 3) Aerator**  
supplies water with oxygen and keeps membranes free from dirt deposits
- 4) Membrane filter**  
guarantees the high water quality
- 5) Clear water storage**  
keeps water available for use
- 6) Aqua Recycling-Control**  
monitors and controls the treatment process
- 7) Aqua-Control (AC1100 shown)**  
booster pump set with mains water back-up facility and controls
- 8) Floor drain**  
is needed as a safety measure



## Operation

The greywater is filtered/treated in three controlled stages in the Aqua-Recycling-Control (ARC) system. First the water passes a coarse filtration stage in order to separate larger dirt particles (hair etc). Then, the water enters the aerobic treatment buffer tank. Here, the incoming water is collected and aerated. Next, in the membrane tank the water is passes through the BMT-Membrane and is lifted to the clear water storage tank. From the clear water storage tank the water is pumped via the Aqua-Control booster pump set to the serviced appliances. If no treated greywater is available or the tanks are undergoing maintenance the Aqua-Control will change to mains water back-up using a WRAS compliant air gap.

### Low running cost and simple maintenance:

The biomechanical Aqua-Recycling-Control only uses electricity to operate its effective treatment process. No chemical additives, no refilling of expensive non environmental substances.

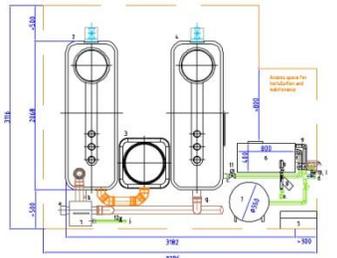
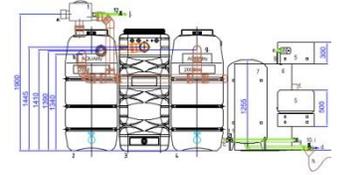
The only element that needs cleaning is the membrane. When the filtration rate is reduced, the system will automatically indicate the need for maintenance - even remotely (maintenance on demand). The membrane is simply exchanged for cleaning by our service team - Quick and without hassle or down time on site.

# Installation examples

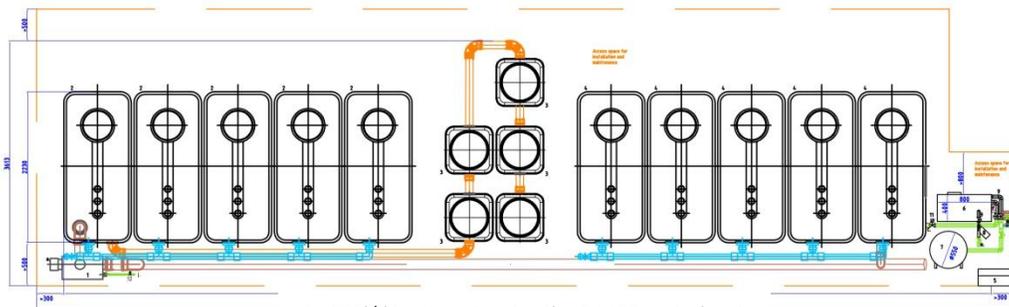
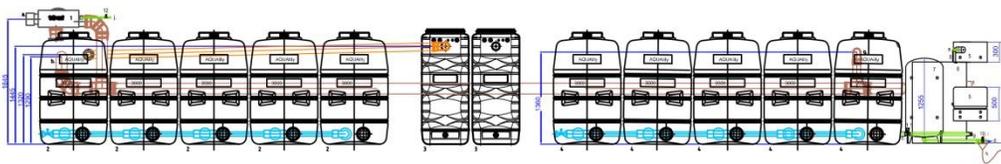
## Above ground system

The Aquality greywater systems are very flexible in design, due to their modular construction. Moreover, they use little space to treat significant amounts of water. Here are just two examples of possible plant room configurations.

The table below states typical plant layouts which will help to get a first idea on space requirements.



3,000/d treatment unit with AC 1100 control unit



15,000/d treatment unit with AC 1100 control unit

Item number	Unit	Treatment Capacity in ltrs per day	Typical space Requirement W x D x H in mm
G 17301	ARC 40 B+	1,000	1,415 x 3,240 x 2,100
G 17302	ARC 80 B+	2,000	2,570 x 3,190 x 2,100
G 17303	ARC 120 B+	3,000	2,730 x 3,770 x 2,100
G 17304	ARC 240 B+	6,000	2,730 x 6,240 x 2,100
G 17305	ARC 360 B+	9,000	2,730 x 8,400 x 2,100
G 17306	ARC 480 B+	12,000	2,730 x 11,610 x 2,100
G 17307	ARC 600 B+	15,000	2,730 x 13,690 x 2,100
G 17308	ARC 900 B+	22,500	2,930 x 13,000 x 2,300

For residential buildings the size could be reduced as the incoming greywater is spread through the day. Allow for a minimum of 500mm working space around equipment and minimum of 800-1000mm headroom. For more detailed design please contact our design team. We reserve the right for technical changes.

# Below ground greywater recycling

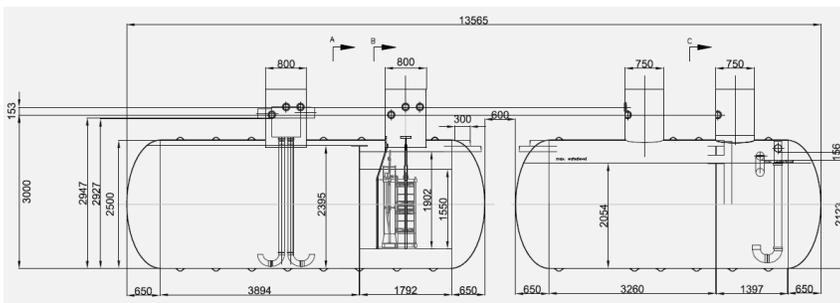
## No basement or plant room available...no problem

If there is no space within the building, the greywater recycling system can be installed underground. The different treatment processes stages, mirroring the above ground system, are carried out in either separate tanks or by using structural baffles in a single tank.

Generally the control as well as the compressor units would be installed in a plant room. In case there is no plant room available these components can be housed in a weather proof housing/kiosk.



Waterproof cabinet for outdoor system



Tank design for large outdoor greywater recycling system with rainwater add-on

## Combined systems

### Why not use both sources – greywater and rainwater?

Greywater can be limited especially when looking at offices or other building types that do not include showers. All buildings will have some kind of roof which might not have been sufficient for rainwater harvesting but in combination with greywater becomes a viable option.

Combining these systems also has the advantage that whenever the clear water storage tank is full, due to sufficient rain, the greywater recycling system stops treating any further greywater. This will not only reduce energy demand but also minimises maintenance for the greywater recycling system.

The add-on costs are minimal. Only a rainwater filter and an enlarged clear water storage tank are needed to go from a greywater only system to a combined greywater & rainwater system.



Indoor combined rainwater harvesting and greywater recycling system in an office building

# Aqua-Control 1100/1500 and 2100/2500

## Compact booster pump set with integrated mains water back-up and controls

### Features:

- Integrated self-priming double booster pump set with multiple-staged, horizontal centrifugal pumps, max. flow rate up to 14m<sup>3</sup>/h
- Demand activated booster pump control (cascade principle)
- Automatic, demand activated and water efficient mains water back-up via integrated break tank and AA-type air gap (BS 8515 / BS 8525)
- Dual storage tank control
- Integrated **touch screen** (AC 1500/2500 Eco) or 4-line LCD display (AC 1100/2100) for indication of operation status, system pressure, level in rainwater holding tank, run time meter per pump, settings and detailed failure indication etc.
- Automatic and manual changeover to mains water supply
- Integrated dry run protection, mains water back-up fault alarm, switchable **pipe burst and leakage alarm** function
- Fully adjustable **stagnation prevention** for mains water pipe
- Volt free contact (3A @ 30VDC) for alarm signal or general fault message to building management systems.
- Pressure and water level sensor included, control and all internal components pre-wired and pre-installed in a compact powder coated steel housing with isolation switch



### Aqua-Control 1500 / 2500 Eco only:

- Leading pump with **variable speed** control
- Integrated **UV-synchronizer** control for low energy use of UV treatment system

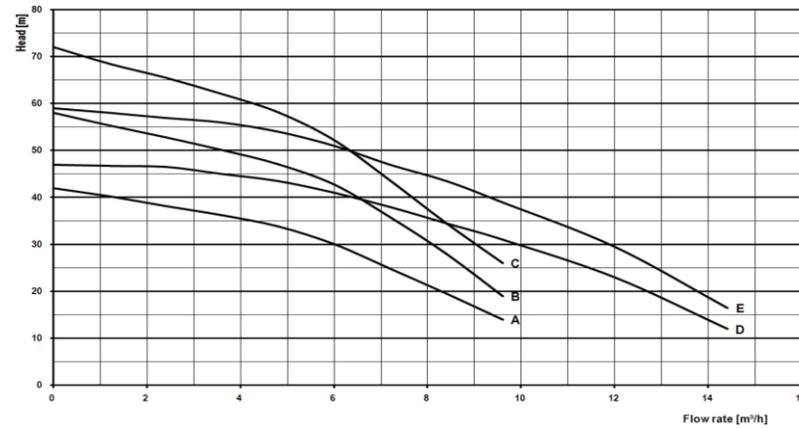
### Operation

The Aqua-Control is a fully equipped control unit with integrated break tank, double booster pump set and electronic control. The control unit monitors the water level in the greywater tank as well as in the mains back up break tank. The self-priming double booster pump set supplies the water directly to the applications. In case of greywater shortage or manual setting, the Aqua-Control feeds mains water automatically and according to demand into the intermediate tank (in compliance with BS 8515 / BS 8525 / WRAS). As an automatic maintenance feature the solenoid valve of the mains water back-up system is regularly opened. If mains water has not been used for a certain time period the unit will flush the mains water pipe and thereby avoid stagnation. Preset standard settings can be adjusted to meet project specific needs.

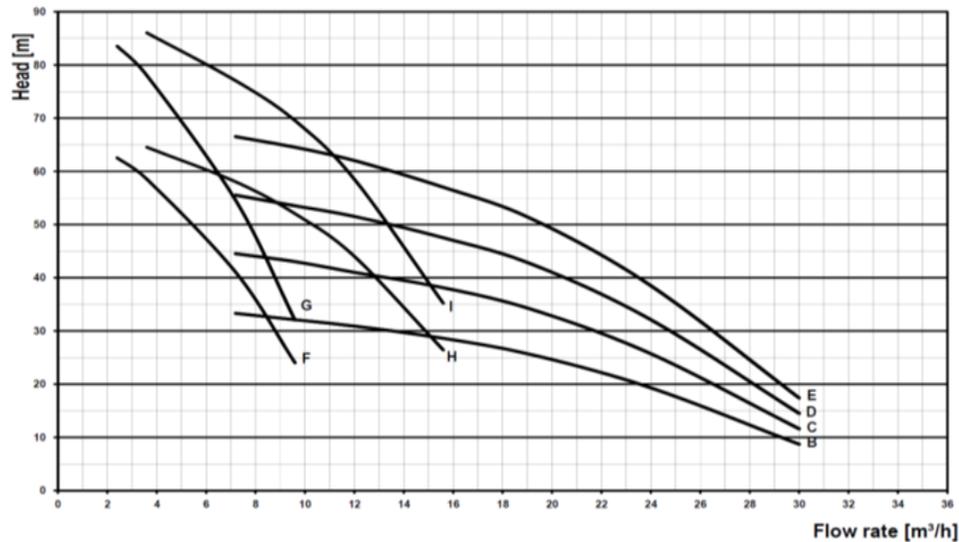
## Technical data:

Technical data:	AC1100/1500	AC2100/2500
Width [mm]	800	570
Depth [mm]	400	650
Height [mm]	1,200/1,400*	1,750
Weight empty [kg]	95/105*	180
Weight max. [kg]	135/145*	240
Integrated break tank [L]	40	60
Emergency overflow [mm]	110 OD	110 OD
Pressure pipe connection	1 ½"	2"
Suction pipe connection	1 ½"	2"
Mains water connection	1 ¼"	1 ½"

(\*only AC 1500 400V version)



Power supply (1~230 V / 50 Hz)	A	B	-	D	-
Power supply (3~400 V / 50 Hz)	-	-	C	-	E
Max. flow rate [m³/h @ minimum head]	8	8	8	14	14
Max. head [m @ minimum flow rate]	42.2	57.7	72	47.3	59
Motor output [kW]	2 x 0.880	2 x 1.200	2 x 1.200	2 x 1.200	2 x 1.440
Max input current [A]	7.8	10.6	10.6	10.6	5
IP rating control housing	54	54	54	54	54
Item No Aqua-Control 1100 S	G13320	G13321	G13322	G13323	G13324
Item No Aqua-Control 1500 Eco	G13325	G13326	G13327	G13328	G13329



Power supply (3 ~ 400 V / 50 Hz)	B	C	D	E	F	G	H	I
Max. flow rate [m³/h @ minimum head]	30	30	30	30	9.6	9.6	15.6	16.6
Max. head [m @ minimum flow rate]	33.3	44.5	55.5	66.6	62.6	83.5	64.5	86
Motor output [kW]	2 x 1.3	2 x 1.5	2 x 2.2	2 x 2.2	2 x 0.9	2 x 1.3	2 x 1.3	2 x 2.2
Max input current [A]	7	6.8	9.2	9.2	5.2	7	7	9.2
IP rating control housing	54	54	54	54	54	54	54	54
Item No Aqua-Control 2100 S	G13361	G13362	G13363	G13364	G13381	G13382	G13383	G13384
Item No Aqua-Control 2500 Eco	G13367	G13368	G13368	G13370	G13385	G13386	G13387	G13388

There are units with higher flow rates and pressure supply available on request.

# Project References

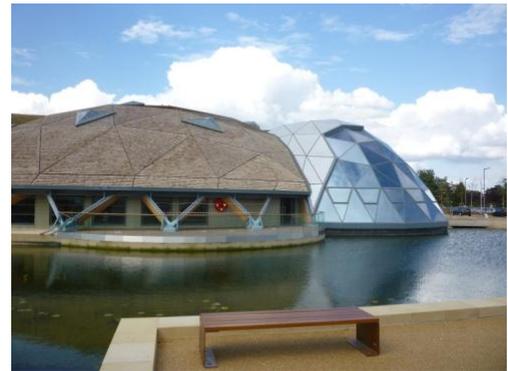
Greywater recycling can be used in many buildings... here are a few examples.



## Severn Trent HQ, Coventry

Building type: **Office**

Combined rainwater harvesting (12m<sup>3</sup> tank) with greywater recycling (500l/d) and bore hole water system



## Scunthorpe Leisure Centre

Building type: **Leisure Centre**

10,000l/d system.

Treated greywater is used for WC flushing and pond top-up



## Mann Island, Liverpool

Building type: **Office**

Very compact 12,000l/d system built on two floors.

## Watford Fire Station

Building type: **Fire Station**

500l/d underground system



## Commonwealth Pool, Edinburgh

Building type: **Leisure Centre**

12,000l/d system installed under pool in two process strings



## Mariners Quay, Newport

Building type: **Apartment Blocks**

System size: 3x 3,000l/d



## Aquality Trading & Consulting Ltd.

Aquality Trading & Consulting Ltd is one of the longest established and leading suppliers of rainwater harvesting and greywater recycling systems in the UK and France.

With decades of in-house experience in this market, we pride ourselves in offering a complete package to Designers, Consultants, Mechanical Contractors, Building Contractors, Civil Engineering Contractors and end users in both the Commercial and Domestic market.

We offer:

- free initial design assistance,
- detailed design,
- system supply,
- installation,
- maintenance and
- a full after sales service package.



We provide Rainwater Harvesting and Greywater Recycling Systems covering all project types, from a single domestic house to some of the largest ever projects in the UK, such as the Westfield Shopping Centre in London.

We provide individual tailored solutions for stormwater and non-potable water management, including sustainable urban drainage systems such as green roofs and attenuation systems.

We offer Rainwater Harvesting and Greywater Recycling CPD presentations for industry professionals seeking to learn more about how this simple, yet effective, technology can enhance their building project.

We are members of UKRHA (UK Rainwater Harvesting Association), UKGBC (UK Green Building Council), FBR (German Rainwater Harvesting Association) ARCSA (American Rainwater Catchment Systems Association) as well as CIBSE (Chartered Institute of Building Services Engineers).

Our Managing Director, Lutz Johnen, is well respected in the industry and served three years as the chairman of the UK Rainwater Harvesting Association. Lutz is also a member of the British Standards Committee (dealing with BS 8515 - Rainwater Harvesting and BS 8525 - Greywater Recycling) and currently representing the UK on the European Standard regarding the subject.

**Aquality Trading & Consulting Ltd.**  
**c/o Bizspace, 6 Wadsworth Road**  
**Perivale UB6 7JJ**  
**Tel: 0845 2707171**  
**[www.aqua-lity.co.uk](http://www.aqua-lity.co.uk)**