

# Activated Carbon Filter

## Installation Operation Maintenance Manual



## Activated Carbon Filter WS1 Series Valve

### Models

FA 1054

FA 1354

FA 1665

FA 2160

FA1248

FA1465

FA1865

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### 1.0 UNPACKING AND PARTS LIST

#### 1.1 UNPACKING NOTES

The unpacking of the Filter is quite straightforward, and there are no 'hidden' items. It is advisable to keep the packages sealed until such time as they are used, to prevent dust or water entry.

#### 1.2 BASIC PARTS LIST

1. VALVE (c/w flow controllers on outlet and drain)
2. CLACK MANUAL
3. INSTRUCTIONS
4. VESSEL (c/w riser and distribution system)
5. 4" - 2 1/2" REDUCER (if required)
6. ACTIVATED CARBON (qty as specified)

#### 1.3 MISSING OR DAMAGED GOODS

Immediately on receipt of the goods, it is advisable to check that all items ordered have been received. If you have any doubt that goods have been supplied as requested, please contact your supplier immediately. If any items are missing or damaged, the carrier and your supplier must be notified within 2 days of receipt if a claim is to be made.

### 2.0 TEMPORARY STORAGE

If installation is not to start immediately after delivery, the equipment should be stored in a clean dry area, where it will not be damaged, or be subjected to temperatures below freezing.

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### 3.0 GENERAL NOTES

These instructions cover the ACTIVATED CARBON Range of filters, which includes model numbers from CA1054 to CM 2469.

It is recommended that these instructions are read thoroughly before commencing any work on the unit, particularly if you have no previous experience of installing and using a filter.

#### 3.1 Chlorine removal

Chlorine removal with Carbon is a catalytic process in which the media does not become blinded or exhausted, but it instead acts as a trigger to the dechlorination process. The active sites on the surface do eventually become blinded by other contaminants in the raw water which means that the media will need to be changed every 1-3 years.

#### 3.3 Organic removal

With organic removal, the contaminant molecules are trapped and retained on the active sites and eventually all of the media will become blinded and will need to be changed.

The control valve completes the backwash cycle automatically at the intervals and times set during installation. Backwash and fast rinse times are set for 20 minutes per cycle but can be altered to suit individual requirements.

All filter valves have the option of an additional volt free microswitch, which can be used to initiate a regen pump etc.

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### 4.0 REGENERATION/BACKWASH

#### 4.1 The Backwash Process

The backwash process consists of two stages:-

**Backwash** - Water flows upwards through the media bed, and out to a drain. As it does so it separates the deposits from the filter media and cleans off any particles of dirt or pipework corrosion products, which may have accumulated during the service cycle.

**Fast Rinse** - This follows the backwash cycle and entails rinsing away any residual deposits from the media and re-packing the media bed. This is carried out down flow with water flowing through the media in the direction of service.

#### 4.2 TIME CLOCK CONTROL OF REGENERATION INITIATION

Most filter application systems are supplied with a time clock configuration valve, which initiate regeneration at a pre-set time (usually 2:00 AM) after a pre-set number of days. The frequency of regenerations is fully adjustable, but a minimum of once every 3 days is recommended.

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### 5.0 PRE-INSTALLATION CHECKS

#### 5.1 MECHANICAL

##### 5.1.1 Foundation/Drainage

The filter will not require any special foundations, provided that a firm, level area, which is capable of supporting the working weight, is available. (See Engineering Data, Section 11.2)

Unwanted water from the backwash process must flow to drain, and so an open drain or gully, capable of passing the necessary flow is required (see Process and Operating Data, 11.1, for relevant flows). The total flow of water to drain depends on site conditions, but will be at least the same as the service flow. Preferably the drain should be level but no higher than 500mm above the filter valve.

##### 5.1.2 Operating Space

The space occupied by the filter can be found in the Engineering Data (Section 11.2).

Access will be required to carry out adjustments or maintenance on the equipment. It is therefore recommended that a minimum of 500mm clearance be allowed around the unit for this purpose.

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### 5.1.4 Pipework

Pipework to be connected to the filter should not have an excessive amount of deposits. Piping that is heavily built up with scale (or Iron deposits) should be replaced.

Make sure that the pipework can be connected to the filter in such a way as to impose no stresses on the control valve, and that it is properly aligned and supported.

A system for the complete by-passing and isolation of the filter should be installed.

### 5.1.5 Water Supply Company Requirements

During backwash the accumulated debris is flushed to drain. Please contact your local Water Authority for advice on effluent issues if concerned with flow to drain.

## 5.2 ELECTRICAL

All filter valves are supplied as 12v complete with a transformer for 240v. A continuous supply of 240v, 5 VA is required which should be provided by an uninterrupted mains supply, which is separately 1 Amp fused, and does not have any additional switch.

A plug is provided with this filter, the cable should be connected to fused spur outlet. However if that is not possible then a plug should be fitted to the cable with a 1 amp fuse. The socket used should be unswitched to prevent the filter from being inadvertently turned off.

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### 6.0 ASSEMBLY/INSTALLATION

#### 6.1 MECHANICAL

Check all the items against the parts list and shipping documents, and ensure you have them all before starting work. In addition to the filter you will require installation materials and basic tools, (i.e., spanners, screwdrivers etc., and PTFE tape)

##### 6.1.1 Pipework

Pipework can be constructed from any normally acceptable material (Copper, Galvanised, Plastic), provided it is properly supported and aligned. Ensure that the pipe is sufficiently large to accommodate the flow of water required, making due allowance for the pressure drop between the filter and the point of discharge of treated water.

***NOTE: IF BRAZED OR SOLDERED FITTINGS ARE TO BE USED, THE PIPE WORK MUST BE DISCONNECTED FROM THE VALVE DURING HEATING AND COOLING. EXCESS HEAT CAN CAUSE PERMANENT DAMAGE TO SOME OF THE VALVE COMPONENTS.***

##### 6.1.2 Drains and overflow connections

The drain connection from the backwash valves is a 3/4" or 1" BSPM thread. Flexible tube should be run from this spigot to a drain capable of taking the maximum flow in regeneration (see Section 11.2), and leaving a similar gap above the drain edge. The drain must not be higher than 500mm above the control valve and preferably should have an air break at the same height as the control valve.

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### 6.2 ASSEMBLY

**Refer to the installation diagrams in Section 13 and note the direction of flow through the system.**

Ensure the installation site is clear and level.

Ensure that the piping system in the building transfers the treated water into a vented header tank to feed any hot water systems.

If possible, place the filter vessel into its final location before filling. Check that the riser tube has the cap in place before commencing filling.

Using a hose 1/3 fill the vessel with water. This is to prevent damage to the bottom distributor when pouring in the media.

Using a funnel slowly pour in the support gravel. Next, slowly pour in the Activated Carbon, taking care not to spill any on the floor and that the riser remains central in the vessel during filling.

After pouring in all of the Carbon media, the vessel should be, at most, 70-75% full. This is to allow rising space for the media during the backwashing cycle. Once the vessel is filled, immediately sweep up any spilled filter media.

Remove the cap from the riser tube and brush any debris out of the threads in the neck of the filter vessel.

Unpack the valve and reducer (if used). Screw the reducer into the filter vessel, then slip the valve down onto the distributor tube. The top distributor should be fitted to the valve.

Screw the valve into the filter vessel, taking extreme care not to cross the threads. As the valve is being run into the vessel excessive force should not be required. Finally tighten to approximately 20ft.lbs torque.

Adjust the position of the filter vessel to line up with the pipework connections, not the position of the valve on the vessel.

Connect the inlet and outlet pipework to the valve using flexible connections or plastic high pressure piping. Flexible pipework is essential to prevent stress on the vessel as it cycles during service since it will expand and contract longitudinally.

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Connect the drain line to the outlet of the drain line flow controller on the valve.

**Ensure** that there is an air break in the drain at the same height as the valve to prevent negative pressure on the vessel.

Connect the power supply to the valve and the unit is now ready for commissioning.

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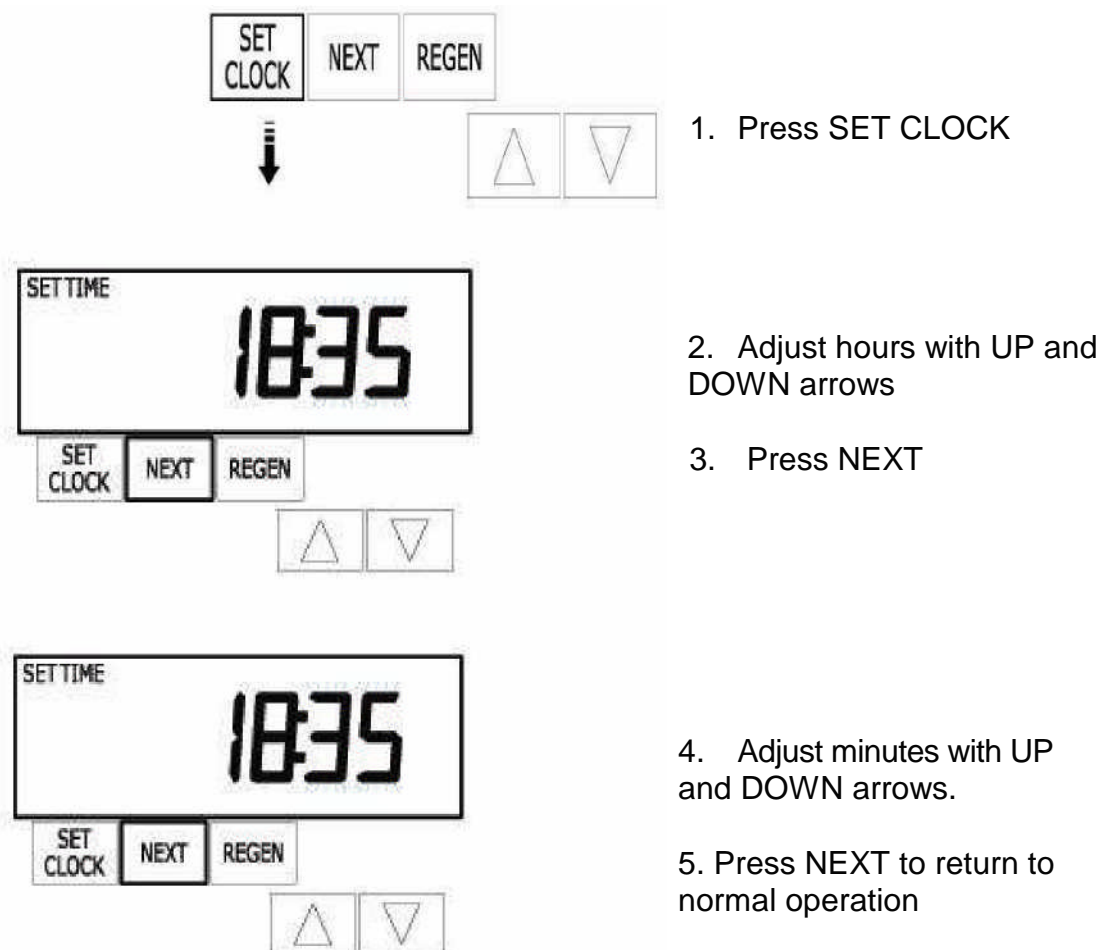
### 7.0 COMMISSIONING

#### 7.1 INTRODUCTION

It is recommended that the commissioning of the plant is undertaken by a trained service engineer, who will be able to put the plant into service quickly, and most efficiently. However, if the services of an experienced engineer are not available, following the steps outlined below will result in the system being properly commissioned.

#### 7.2

#### Setting the Time of Day



The diagram illustrates the process of setting the time of day on the control panel. It shows three stages of the process:

1. Press SET CLOCK
2. Adjust hours with UP and DOWN arrows
3. Press NEXT
4. Adjust minutes with UP and DOWN arrows
5. Press NEXT to return to normal operation

The filter regeneration cycles have been factory programmed.

The time of day for regeneration to take place has been entered as 2.00 AM and this can be altered depending on site requirements.

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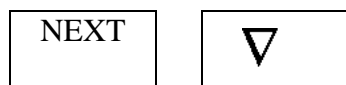
## Regeneration Programming

(All programming below is Factory set)

To alter settings – Press “□” and “□” keys

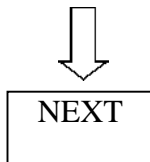
To back up at any stage – Press “REGEN”

To save any changes – Press “SET CLOCK”

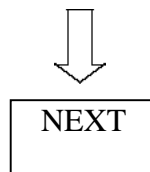


Press and hold together for 5 seconds

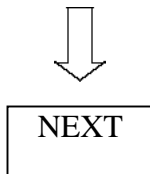
“Filtering” will be flashing in top right corner



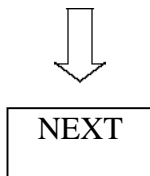
Set 1<sup>st</sup> cycle time in minutes –  
BACKWASH set at 10 min



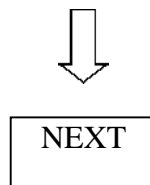
Set 2<sup>nd</sup> cycle time in minutes – RINSE set  
at 6 min



Regen set to oFF



Regen set to NORMAL



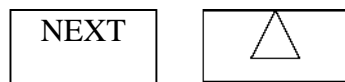
Programming Finished – Return to time of  
day

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### User Programming

To alter settings – Press “□” and “□” keys  
To back up at any stage – Press “REGEN”  
To save any changes – Press “SET CLOCK”



Press together and hold for 5 seconds



Set influent Hardness to nA



Set effluent Hardness to nA



Set number of days to next regeneration  
(set to 3 days)



Set time for regeneration.  
Time for Immediate regeneration valves  
cannot be altered and will show “on 0”

Returns to time of day

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## 7.3 COMMISSIONING

- 7.3.1 The objective of commissioning is to fill the filter with water, check for leaks and prepare it for service. The simplest way to commission the unit is to initiate a backwash. This will eliminate the air from the system and flush the media prior to use.
- 7.3.2 Before opening the inlet water supply switch on the power, which will activate the piston motor and the timer motor.
- 7.2.3 Next, start a manual backwash by pressing the regen button for 3 sec or until the motor starts to turn.
- 7.2.4 When the motor has stopped switch off the power and slowly open the inlet water supply. At first, air will be expelled from the drain line, followed by water once the vessel is full. Allow water to run to drain on the backwash cycle for 10-15 minutes in order to rinse the filter media and remove any fines.
- 7.2.5 Turn the power back on and allow the complete a manual regen in full by pressing the regen button for 3 sec and allowing the valve to complete the cycle.
- 7.2.9 The filter is now commissioned.

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### **8.0 ROUTINE MONITORING**

The following recommendations are made to help the user of the filter confirm that it is performing as required, and to give early warning of possible problems. The operation of the filter is completely automatic, and should not require adjustment.

#### **Weekly**

Check the treated water quality with a test kit.

#### **Monthly**

Check raw water quality, and record. Compare with original quality and adjust frequency of backwash if required.

#### **Six Monthly**

Perform a chlorinated backwash to remove any organic build up on the media. Check filter media depth against original level.

#### **Annually**

Inspect and clean/replace as necessary the piston and the internal seals. A competent engineer familiar with Clack valves should perform this.

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## 9.0 FAULT FINDING AND RECTIFICATION

### 9.1 NO FLOW TO SERVICE

Check mains pressure is above 1.7 bar.

Check inlet water supply

Check inlet and outlet isolating valves are open.

Check service outlet valve is open.

Check pressure drop across media. If excessive, media may be fouled, or internals blocked. Initiate a backwash. If this does not free up the media the filter will need to be inspected and serviced by a competent engineer.

Backwash with chlorine solution to remove organic build up

### 9.2 POOR TREATED WATER QUALITY

Check manual by-pass closed.

Check raw water pressure above minimum. If flow is less than design rate, channelling of water can occur in media, which results in inadequate treatment.

Increase frequency of backwash as media may be becoming overloaded.

Increase backwash flow.

Check piston and seals & spacers. Check raw

water analysis for changes

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### 9.3 NO BACKWASH

Check electrical supply, fuses etc. satisfactory.

Check program.

Check timer motor is running.

Check drive motor runs, by manually initiating a backwash, and listening for drive motor as it advances between cycles. Replace if necessary.

### 9.4 UNSATISFACTORY CAPACITY BETWEEN BACKWASHES

Increase frequency of backwash

Check age of media and media level

Increase backwash flow

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## **10.0 WARRANTY AND SERVICE**

### 10.1 AFTER SALE WARRANTY

Your filter is covered by a parts warranty for a period of one year from purchase.

Consumable filter media is excluded from this warranty

Should you have any problems with your filter or require a routine service, please contact your supplier.

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### 11.0 TECHNICAL DATA

#### 11.1 PROCESS AND OPERATING DATA

##### 11.1.1 ACTIVATED CARBON CA1054 TO CA1465

Model		CA1054	CA1248	CA1354	CA1465
Parameter	Units				
Flow Rate	M3/hr	0.4	0.5	0.7	1.0
Backwash Flow	M3/hr	0.5	0.9	1.0	1.2
Regeneration Time	Mins	20	20	20	20
Max. Operating Temperature	Degrees C	45	45	45	45

##### 11.1.2 ACTIVATED CARBON CA1665 TO CA2469

Model		CA1665	CA1865	CA2160	CA2469
Parameter	Units				
Flow Rate	M3/hr	1.4	1.9	2.25	3.25
Backwash Flow	M3/hr	1.5	2.2	2.60	3.40
Regeneration Time	Mins	20	20	20	20
Max. Operating Temperature	Degrees C	45	45	45	45

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## 11.2 ENGINEERING DATA

Activated Carbon Series Filters CA1054 to CA1465

Model		CA1054	CA1248	CA1354	CA1465
Valve		WS1	WS1	WS1	WS1
Filter Vessel		1054	1248	1354	1465
Parameter	Unit				
Height of Filter	Mm	1601	1458	1601	1984
Diameter of Filter	Mm	254	305	331	356
Height of Valve	mm	170	170	170	170
Filter Inlet Conn.	Inches BSPM	1	1	1	1
Filter Outlet Conn.	Inches BSPM	1	1	1	1
Drain Conn.	Inches BSPM	3/4	3/4	3/4	3/4
Qty of Gravel	Bags	1	1	1	1.5
Qty of Carbon	Bags	0.8	1	1.4	2
Electrical Power	Watts	1.2	1.2	1.2	1.2

PRESSURE 1.7 Bar MAXIMUM OPERATING TEMPERATURE 45.0C  
HEADROOM - Allow 100 mm greater than overall height.

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Activated Carbon Series Filters CA1665 to CA2469

<b>Model</b>		<b>CA1665</b>	<b>CA1865</b>	<b>CA2160</b>	<b>CA2469</b>
<b>Valve</b>		<b>WS1</b>	<b>WS1</b>	<b>WS1</b>	<b>WS1</b>
<b>Filter Vessel</b>		<b>1665</b>	<b>1865</b>	<b>2160</b>	<b>2469</b>
<b>Parameter</b>	<b>Unit</b>				
<b>Height of Filter</b>	<b>Mm</b>	<b>1984</b>	<b>1984</b>	<b>1800</b>	<b>2288</b>
<b>Diameter of Filter</b>	<b>Mm</b>	<b>407</b>	<b>460</b>	<b>534</b>	<b>609</b>
<b>Height of Valve</b>	<b>mm</b>	<b>170</b>	<b>170</b>	<b>170</b>	<b>170</b>
<b>Filter Inlet Conn.</b>	<b>Inches BSPM</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Filter Outlet Conn.</b>	<b>Inches BSPM</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Drain Conn.</b>	<b>Inches BSPM</b>	<b>3/4</b>	<b>3/4</b>	<b>3/4</b>	<b>3/4</b>
<b>Qty of Gravel</b>	<b>Bags</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>Qty of Carbon</b>	<b>Bags</b>	<b>2.5</b>	<b>3</b>	<b>4</b>	<b>6</b>
<b>Electrical Power</b>	<b>Watts</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>

PRESSURE 1.7 Bar MAXIMUM OPERATING TEMPERATURE 45.0C  
 HEADROOM - Allow 100 mm greater than overall height.

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## 13.0 SPARES LIST

### 14.1 WS1 Valves

<b>PART NO.</b>	<b>DESCRIPTION</b>
XCV3011	Piston
XFR1	Riser Tube c/w 1" Dist
XCV3005	Seal & Spacer kit
XCV3107-01	Drive Motor 12v
XCV3108	PCB
VDLFC3	3/4" Brass flow controller (please specify)
VDLFC4	1" Brass flow controller (please specify)

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## 15.0 CE Certificate

### Manufacturer's Declaration of Conformity

We the undersigned

**EURAQUA UK, HITCHIN, ENGLAND**

Certify that the product

***TYPE: ACTIVATED CARBON FILTER WITH WS1 AC VALVE***

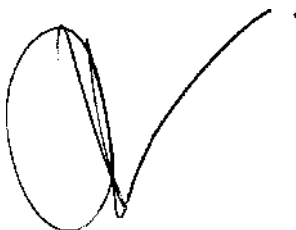
*has been designed and manufactured in accordance with the specifications of the following:*

#### **Directive**

Machinery Directive 89/392/EEC  
Low Voltage Directive 73/23/EEC  
EMC-Directive 89/336/EEC

#### **Standard**

EN 292-1, EN 292-2  
EN 60 335-1  
EN 55 014



RT Adam

**03/01/02** Director

**Hitchin, England**

*Issue place & date*