PYROLOX FILTER SYSTEM

INSTALLATION OPERATION MAINTENANCE MANUAL

Pyrolox Filter
WS1, WS1.5 & WS2 Series Valve

Models

CF 1054/EN	CB 1248/EN
CF1354/EN	CF1465/WC
CF1665/WC	CF1865/WC
CF 2160/WC	CF2469/WC
CF3072/WC	

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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. PYROLOX (qty as specified)
7. GRAVEL (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.

3.0 GENERAL NOTES

These instructions cover the PYROLOX Range of filters, which includes model numbers from CF1044 to CF 3072.

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.

3.1Iron & Manganese Removal

Heavy metallic contaminants, and some non-metallic contaminants can be removed from water using specific media. These media can be mixed in a multi-layer bed which, when combined with an appropriate backwash or regeneration system, can be tailored to solve a wide range of specific contaminant problems.

Iron and manganese and sometimes aluminium and hydrogen sulphide can be removed with a catalytic filter media, which uses oxygen in the water to convert the metal ions from the soluble to an insoluble form. The insoluble precipitate is then filtered out onto the surface of the media. Depending on the composition of the raw water a choice of media can be used.

Pyrolox filter media is one of these medias and just requires backwashing with the raw water to clear the bed. The operating parameters for Pyrolox make it suitable for a number of water types.

3.2 System Management

In order to remove accumulated deposits from the filter bed, the water flow through the filter is reversed (backwashed). Water is run to drain at a high rate to separate the filter media from the deposits. The control valve completes the backwash cycle automatically at the intervals and times set during installation. Backwash and fast rinse times are set for 16 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.

3.3 Pyrolox System Operation 'Frequently Asked Questions'

The main uses for a PYROLOX filter are for domestic and commercial removal of Iron, Manganese, Hydrogen Sulphide and general turbidity. The Pyrolox media is a catalytic media that is not used up in the reaction however oxygen has to be present in the water to enable the oxidisation to occur. If the feed water does not contain the necessary level of oxygen then a system for adding this will be required

The feed water flows under pressure to the control valve on the vessel where it is directed through to the filtration media. Pyrolox systems built with WS1, 1.5 or 2 valves will bypass raw water during backwash. For this reason the systems are set to backwash at 2:00 AM.

Maximum Iron levels: Pyrolox systems can be used on Iron levels of up to 20 ppm with certain reservations. There are a number of examples working satisfactory at higher levels.

Manganese removal: Manganese removal in a Pyrolox system is dependent on the level of Iron and other contaminants in the raw water. The greater the amount of Iron, the easier it is to remove the Manganese. With an Iron: Manganese ratio of 10:1, the Manganese is extracted very well at a pH of 7.0-7.5. When the ratio reaches 5:1 then the pH needs to be between 7.8-8.2. When the Manganese level exceeds the amount of Iron then a pH of above 8.3 is required. While the pH correction media in the Pyrolox blend will raise the pH of acid water, it cannot raise it above 8.0 consistently if the general level of dissolved solids is high and the Langellier index is saturated. A full water analysis is essential when considering using the Pyrolox system primarily for Manganese removal.

Hydrogen Sulphide: Hydrogen sulphide is removed at concentrations of up to 3 ppm.

Humic acid/tannins: Decaying organic matter in the raw water supply creates Humic acid or tannins, sometimes seen as light brown colour in low pH 'peaty' water supplies. These tannins can combine and complex with Iron and Sulphur, coating and blinding the media reducing its effectiveness. The tannin level in the raw water should be less than 2 ppm and ideally less than 1 ppm to eliminate the need for frequent changes or rejuvenation of the filter media. With high tannin water supplies it will be necessary to oxidise the tannins to an insoluble floc that is filtered out with the other contaminants. The most effective oxidiser is Ozone, and an Ozone generator with injection venturi and off-gas valve has proved to be very successful at preventing tannin blinding. An alternative is to remove the tannins with an Organic Scavenger. Moreover, Organic Scavengers need to be regenerated with Caustic Brine requiring the control and addition of two consumables, one of which is corrosive and difficult to handle.

Chlorides: Very high Chloride levels in the raw water can inhibit the performance of the Pyrolox system by preventing Iron and Manganese from precipitating. In normal circumstances the Chloride level in the raw water should be less than 100 ppm and ideally below 50 ppm.

Backwash: While the Pyrolox system is designed to operate and backwash at the same flow rate, it essential that there is sufficient pressure and volume of water at the recommended backwash flow. It may be necessary to fit a larger backwash flow button, or even a higher flow valve on larger systems if the pressure is low, just to achieve the required cleaning of the filter bed. Alternatively a longer backwash may be needed to achieve the same effect.

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.

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.

5.1.3 Incoming Water

The raw water to be fed to the filter must comply with the following:-

1. Maximum iron level = 20ppm
2. pH range = 6.0-9.0
3. Organic matter = less than 5ppm
4. Free chlorine = less than 0.5ppm
5. Chloride below 100 ppm
6. Temperature = 3 - 45□C (35 - 110□F)
7. No Oil or Polyphosphates
8. Backwash flow rate must be at least the same as the service flow rate available with a pressure of 3 bar

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.

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.

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 Gravel and then Pyrolox, 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 filter media, the vessel should be, at most, 50% 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. No top distributor is used on filter valves to allow the maximum amount of debris to be backwashed off the media.

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.

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.

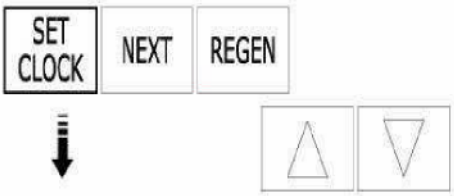
Connect the power supply to the valve and the unit is now ready for commissioning.

7.0 COMMISSIONING

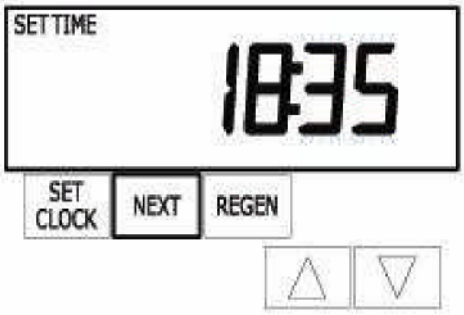
7.1 INTRODUCTION

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

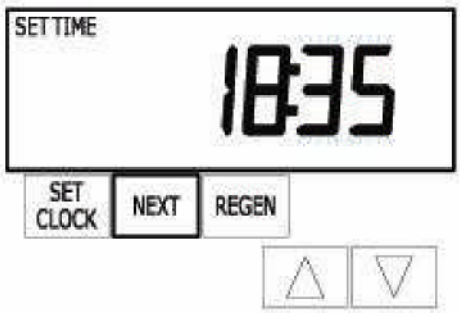


1. Press SET CLOCK



2. Adjust hours with UP and DOWN arrows

3. Press NEXT



4. Adjust minutes with UP and DOWN arrows.

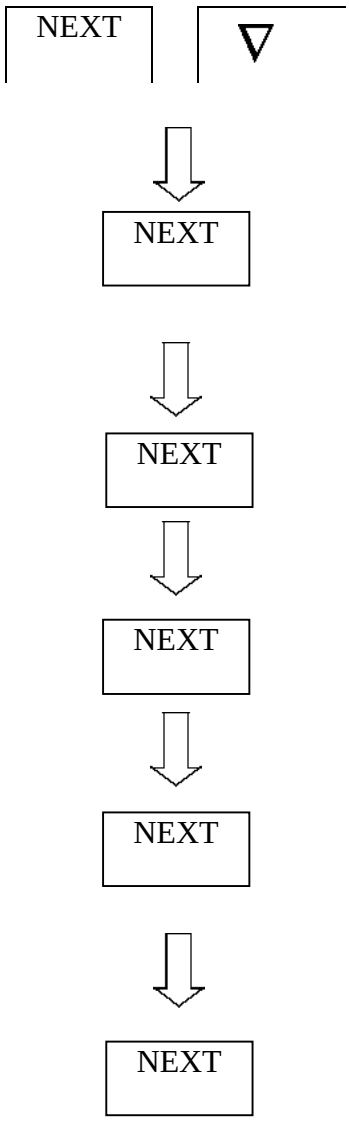
5. Press NEXT to return to normal operation

The filter regeneration cycles have been factory programed.
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.

Regeneration Programming

(All programming below is Factory set)

To alter settings – Press “Next” and “Up” 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 1st cycle time in minutes – BACKWASH set at 10 min

Set 2nd cycle time in minutes – RINSE set at 6min

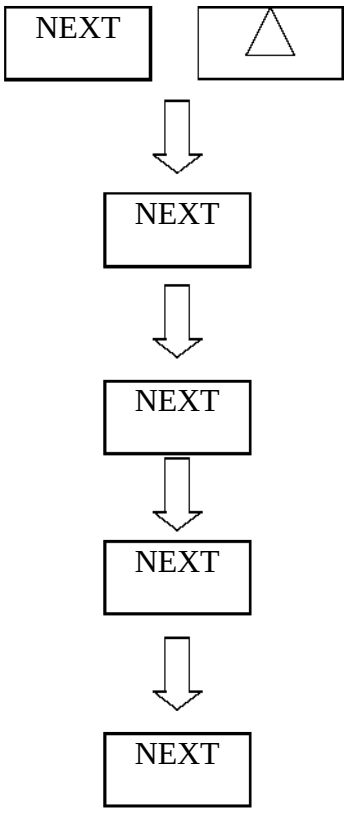
Regen set to oFF

Regen set to NORMAL

Programming Finished – Return to time of day

User Programming

To alter settings – Press “Next” and “Up” 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 regeneratuion (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

7.3 COMMISSIONING

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.

Before opening the inlet water supply switch on the power, which will activate the piston motor and the timer motor.

Next, start a manual backwash by pressing the regen button for 3 sec or until the motor starts to turn.

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 until it runs clear to rinse the filter media and remove any fines.

Turn the power back on and allow the complete a manual regen in full by pressing the regen button and allowing the valve to complete the cycle.

The filter is now commissioned.

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.

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.

Backwash with chlorine solution to remove organic build up

Increase frequency of backwash as media may be becoming overloaded.

Increase backwash flow.

Check piston and seals & spacers. Check raw water analysis for changes

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

Backwash with chlorine solution to remove organic build up

Increase backwash flow

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 installation or 14 months 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.

11.0 TECHNICAL DATA

11.1 PROCESS AND OPERATING DATA

11.1.1 PYROLOX CF1054 TO CF1354

Model		CF 1044	CF1248	CF1354
Parameter	Units			
Flow Rate	M3/hr	0.9	1.35	1.8
Backwash Flow	M3/hr	1.8	2.6	3.0
Regeneration Time	Mins	20	20	20
Max. Operating Temperature	Degrees C	45	45	45

11.1.2 PYROLOX CF1465 TO CF 1865

Model		CF 1465	CF1665	CF1865
Parameter	Units			
Flow Rate	M3/hr	2.3	3.65	4.5
Backwash Flow	M3/hr	3.5	4.6	5.7
Regeneration Time	Mins	20	20	20
Max. Operating Temperature	Degrees C	45	45	45

11.1.3 PYROLOX CF 2160 TO CF 3072

Model		CF 2160	CF2469	CF3072
Parameter	Units			
Flow Rate	M3/hr	6.4	9.0	15.0
Backwash Flow	M3/hr	7.9	12.1	17
Regeneration Time	Mins	20	20	20
Max. Operating Temperature	Degrees C	45	45	45

11.2 ENGINEERING DATA

PYROLOX Series Filters CF1044 to CF 1465

Model		CF1044	CF1248	CF1354	CF1465	CF1665
Valve		WS1	WS1	WS1	WS1	WS1.5
Filter Vessel		1054	1248	1354	1465	1665
Parameter	Unit					
Height of Filter	Mm	1601	1458	1601	1984	1984
Diameter of Filter	Mm	254	305	331	356	407
Height of Valve	mm	170	170	170	170	170
Filter Inlet Conn.	Inches BSPM	1	1	1	1	1.5
Filter Outlet Conn.	Inches BSPM	1	1	1	1	1.5
Drain Conn.	Inches BSPM	3/4	3/4	3/4	¾	1
Qty. of Gravel	Bags	0.25	0.5	0.75	1.5	1.5
Qty of Pyrolox	Bags	2	3	4	5	8
Electrical Power	Watts	1.2	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.

PYROLOX Series Filters CF1865 to CF 3072

Model		CF1865	CF2160	CF2469	CF3072
Valve		WS1.5	WS2	WS2	WS2
Filter Vessel		1865	2162	2472	3072
Parameter	Unit				
Height of Filter	Mm	1722	1721	1915	2202
Diameter of Filter	Mm	458	534	610	762
Height of Valve	mm	170	340	340	340
Filter Inlet Conn.	Inches BSPM	1.5	2	2	2
Filter Outlet Conn.	Inches BSPM	1.5	2	2	2
Drain Conn.	Inches BSPM	1	2	2	2
Qty. of Gravel	Bags	2	3	5	8
Qty of Pyrolox	Bags	10	12	16	22
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.

12.0 SPARES LIST

12.1 WS1 Valves

PART NO.	DESCRIPTION
XCV3011	Piston
XCV3005	Seal & Spacer kit
XCV3107-01	Drive Motor 12v
XCV3108	PCB

12.2 WS1.5 Valves

PART NO.	DESCRIPTION
XCV3407	Piston
XCV3430	Seal & Spacer kit
XCV3107-01	Drive Motor 12v
XCV3108	PCB

12.3 WS2 Valves

PART NO.	DESCRIPTION
XCV3725	Piston
XCV3729	Seal & Spacer kit
XCV3107-01	Drive Motor 12v
XCV3108	PCB

13.0 CE Certificate

Manufacturer's Declaration of Conformity

We the undersigned

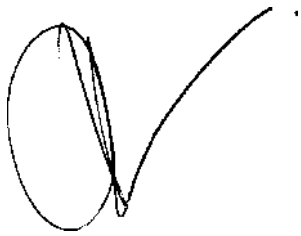
EURAQUA UK, HITCHIN, ENGLAND

Certify that the product

TYPE: PYROLOX FILTER WITH WS1, WS1.5 & WS2 AC VALVE

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

Directive	**Standard**
Machinery Directive 89/392/EEC	EN 292-1, EN 292-2
Low Voltage Directive 73/23/EEC	EN 60 335-1
EMC-Directive 89/336/EEC	EN 55 014



RT Adam

03/01/02 Director

Hitchin, England

Issue place & date