

BIRM Series Filter

Installation Operation Maintenance Manual

Birm Filter 2510-3150 Series Valve

Models

FB1054

FB1248

FB1354

FB1465

FB1665

FB1865

FB2160

FB2469

FB3072

FB3672

FB4278

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1.0	UNPACKING AND PARTS LIST	

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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. FLECK MANUAL
3. INSTRUCTIONS
4. VESSEL (c/w riser and distribution system)
5. 4" - 2 1/2" REDUCER (if required)
6. BIRM (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 Birm Range of filters, which includes models ranging in size from 1054 - 4278.

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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 Iron & 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.

BIRM filter media is one of these medias and just requires backwashing with the raw water to clear the bed. The operating parameters for Birm make it suitable for a number of water types, although not water that is acidic in nature, please see page 20 for full details.

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 20 minutes per cycle but can be altered to suit individual requirements.

Backwashing of Birm is required at twice the service flow rate to ensure a good lift of the bed and to allow all accumulated debris to be removed. All filter valves come complete with an additional volt free microswitch which can be used to initiate a 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 after a pre-set number of days. The frequency of regenerations are 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 approximately 2 times 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 = 15ppm
2. Oxygen level = 15% of iron level
3. pH range = 6.8 - 9.0
4. Alkalinity = greater than 2 x sulphate + chloride
5. Organic matter = less than 5ppm
6. Free chlorine = less than 0.5ppm
7. Temperature = 3 - 45°C (35 - 110°F)
8. No Hydrogen Sulphide, Oil or Polyphosphates
9. Backwash flow rate must be 2 times service rate

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5.1.4 Pipework

Pipework to be connected to the filter should not have an excessive amount of desposits. 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 and oxidised iron and manganese is flushed to drain. Please contact your local Water Authority for advise on effluent issues if concerned with flow to drain.

5.2 ELECTRICAL

All filter valves are supplied as 24v 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 not provided with this filter since 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 softener 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 PIPEWORK 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 valve will range from a 1/2" hose spigot up to a 2" BSPM thread depending on the valve size and configuration. Flexible tube or piping should be run from the drain outlet to a drain capable of taking the maximum flow in backwash (see Section 11.2). 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

Ensure the installation site is clear and level.

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 Birm, 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, 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. 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.

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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 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 regeneration. This will eliminate the air from the system and flush the resin prior to use.

- 7.2.1 Before opening the inlet water supply or switching on the power supply, open the hinged valve cover, lift the timer assembly and turn the timer clockwise to the backwash position. This position is the first bank of pins on the program wheel where both microswitches have been lifted.
- 7.2.2 Switch on the power which will activate the piston motor and the timer motor. When the piston motor has stopped, 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 5-6 minutes in order to rinse the filter media and remove any fines.
- 7.2.3 Next, turn the timer to the first gap in the pins. Ensure that the motor has stopped before indexing to the next position.
- 7.2.4 Turn the timer to the fast rinse position (second bank of pins) and water will swiftly run to drain. When the motor has stopped, turn the timer to the second gap in the pins.
- 7.2.5 When the motor has stopped, index the timer to the last two pins and the main piston will now return to the service position.
- 7.2.6 Wait for the piston motor to stop before turning the timer to the standby position (back microswitch will drop into notch in program wheel and piston motor will momentarily move).
- 7.2.7 Set time of day by depressing red knob and spinning outer dial until the correct time is displayed next to the arrow with a green dot.

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7.2.8 Set frequency of regenerations by pushing out the metal pins on the skipper wheel to the days you wish a regeneration to occur.

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 regenerations if required.

Annually

Inspect and clean/replace as necessary the piston and the internal seals. This should be performed by a competent engineer familiar with Fleck valves.

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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.

9.2 POOR TREATED WATER QUALITY

Check manual by-pass closed.

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

Increase frequency of backwash as media may be exhausted.

Check piston and seals & spacers.

Check raw water analysis for changes

9.3 NO BACKWASH

Check electrical supply, fuses etc. satisfactory.

Check pins have been correctly set for regeneration.

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.

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9.4 UNSATISFACTORY CAPACITY BETWEEN BACKWASHES

Increase frequency of backwash and check capacity details on Birm Data Sheet page 20

Check age of media

Perform a Chlorinated backwash to remove organic matter from the filter media

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.

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 Birm Series Filters FB1054-1865

MODEL		1054	1248	1354	1465	1665	1865
PARAMETER	UNITS						
Flow rate	m ³ /hr	0.60	0.85	1.00	1.20	1.50	1.90
Backwash Flow	m ³ /hr	1.20	1.70	2.00	2.40	3.00	3.80
Regeneration Time	mins	20	20	20	20	20	20
Max Operating Temperature	°C	45	45	45	45	45	45

11.1.2 Birm Series Filters FB2160-4278

MODEL		2160	2469	3072	3672	4278
PARAMETER	UNITS					
Flow Rate	m ³ /hr	2.60	3.40	5.30	7.70	10.50
Backwash Flow	m ³ /hr	5.20	6.80	10.60	15.40	21.00
Regeneration Time	mins	20	20	20	20	20
Max Operating Temperature	°C	45	45	45	45	45

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11.2 ENGINEERING DATA

Birm Series Filters

11.2.1 FB1054-1865

MODEL		1054	1248	1354	1465	1665	1865
VALVE (std)		2510	2510	2510	2510	2510	2750
PARAMETER	UNITS						
Height of vessel (approx)	mm	1370	1220	1370	1650	1650	1650
Height of valve from vessel	mm	170	170	170	170	170	170
Inlet Conn.	ins BSPM	1	1	1	1	1	1
Outlet Conn.	ins BSPM	1	1	1	1	1	1
Drain Conn.	ins	1/2	1/2	1/2	1/2	1/2	3/4
Qty of Gravel	25kg bags	1	1	1	2	2	2
Qty of Birm	20kg bags	1	1.5	2	2.5	3	5
Electrical Power	v	24	24	24	24	24	24
	Hz	50	50	50	50	50	50
	V/A	1.2	1.2	1.2	1.2	1.2	1.2

MAXIMUM OPERATING PRESSURE 8 Bar MINIMUM OPERATING PRESSURE 1.7 Bar MAXIMUM OPERATING TEMPERATURE 45.0C
 HEADROOM - Allow 100 mm greater than overall height.

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11.2.2 FB2160-4278

MODEL		2160	2469	3072	3672	4278
VALVE (std)		2850	3150	3150	3150	3150
PARAMETER	UNITS					
Height of vessel (approx)	mm	1525	1755	1830	1830	1980
Height of valve from vessel	mm	170	255	255	255	255
Inlet Conn.	ins BSPM	1.5	2	2	2	2
Outlet Conn.	ins BSPM	1.5	2	2	2	2
Drain Conn.	ins	1	2	2	2	2
Qty of Gravel	25kg bags	3	4	5	6	10
Qty of Birm	20kg bags	6	8	14	20	28
Electrical Power	v	24	24	24	24	24
	Hz	50	50	50	50	50
	V/A	1.2	1.2	1.2	1.2	1.2

MAXIMUM OPERATING PRESSURE 8 Bar MINIMUM OPERATING PRESSURE 1.7 Bar MAXIMUM OPERATING TEMPERATURE 45.0C
 HEADROOM - Allow 100 mm greater than overall height.

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12.0 BIRM FILTER MEDIA SAFETY INFORMATION SHEET

MANUFACTURER: CLACK CORPORATION, WINDSOR, WI 53598, USA
EMERGENCY TEL NO. 001 608 262 3702

(A) PHYSICAL DATA

(a) Appearance and odour:	Black Granule; no odour
(b) Packaging type and size:	28 litre (1 cu ft) 20kg polyprop bag
(c) Markings/label:	BIRM Regular
(d) Boiling Point:	3806°F
(e) Solubility in water:	Insoluble
(f) Evaporation rate:	Not applicable
(g) pH:	Not applicable
(h) Percentage volatile by volume:	Not applicable
(l) Vapour density (air=1):	Not applicable

(B) FIRE & EXPLOSION DATA & REACTIVITY

(a) Flash point (oC):	Not applicable
(b) Minimum ignition temperature:	Not applicable
(c) Flammability limits in air (% volume)	Not applicable
(d) Special fire fighting precautions or extinguisher:	None
(e) Unusual fire/explosion hazards:	Material can be a mild oxidiser
(f) Possible dangerous reactions:	None

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(C) COMPOSITION

[Hazardous material to be indicated with an asterisk (*)]

3% Manganese Dioxide coating on amorphous and crystalline silica with bonding agents

(D) HEALTH HAZARD DATA

- | | |
|------------------------------------|---|
| (a) Toxicity: | Non toxic either by external or internal contact |
| (b) Threshold Limit Value: | The dust falls into the category of nuisance and the TLV as recommended in Guidance Note EH15 issued by the Health and Safety Executive should not be exceeded. |
| (c) Effect on skin: | Temporary irritation, flush with water and soap. |
| (d) Effect on eyes: | Temporary irritation, flush with water for 15 minutes. |
| (e) Effects of inhalation (dust): | Temporary irritation. Long term inhalation of crystalline dust may cause lung disease (silicosis) |
| (f) Effects of inhalation (fumes): | Not applicable |
| (g) Effects of ingestion: | Dehydration. Give water and call physician. |
| (h) Carcinogenic effects: | None known. Ames test negative. |

(E) EFFECT OF HEAT ON MATERIAL

- | | |
|---------------------------------------|------|
| (a) Does decomposition occur: | No |
| (b) Hazardous decomposition products: | None |

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(F) PROTECTIVE EQUIPMENT

- | | |
|-----------------------------------|-------------------------------------|
| (a) Ventilation requirements: | Normal dust collection apparatus |
| (b) Respiratory protection?: | Yes, Type BS.2091 |
| (c) Gloves?: | Yes, Type - Rubber waterproof |
| (d) Eye protection?: | Yes, Type BS.2092 D |
| (e) Special first aid treatment?: | For dust in eyes, cold water douche |

(G) STORAGE

Store in cool dry area.

(H) DISPOSAL AND SPILLAGE INSTRUCTIONS

Normal dust or powder handling equipment can be used to recover spillage's.
The material can be safely strewn on earth or placed in refuse pits.

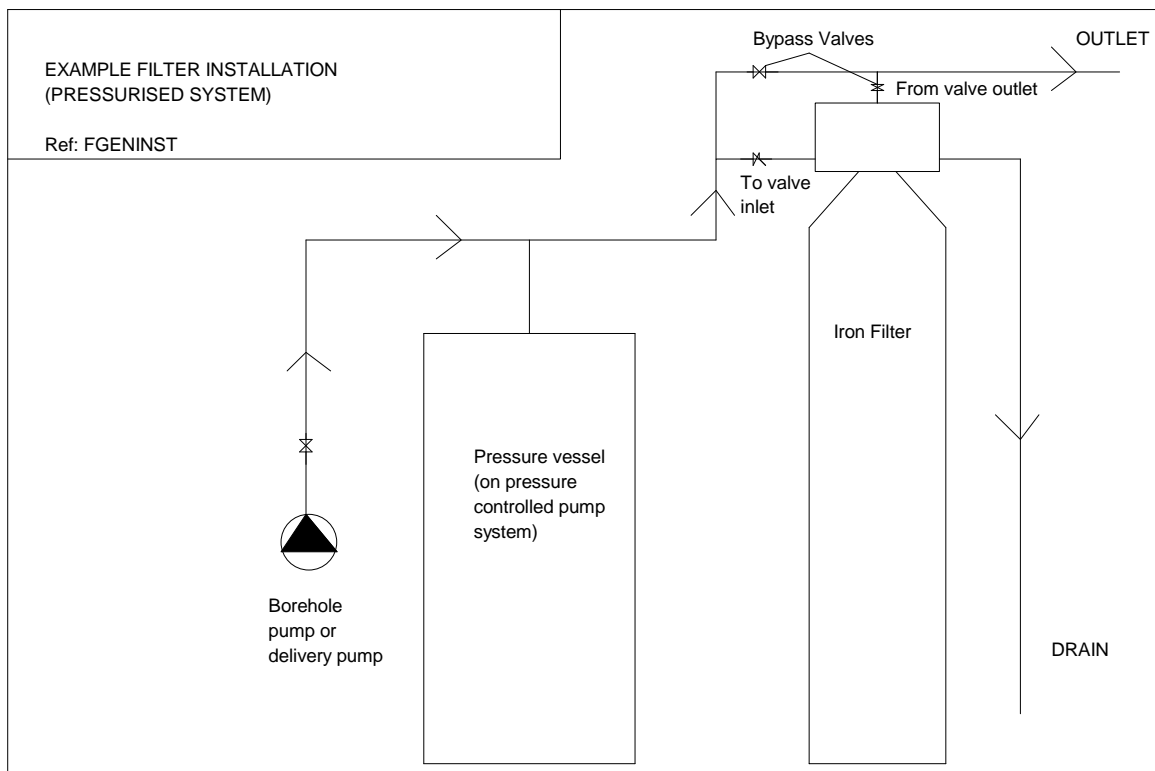
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13.0 Drawings

13.1 Installation Layout

Fig 1 General Installation Layout Filters



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14.0 SPARES LIST

14.1 2510 & 2750 Valves

PART NO.	DESCRIPTION
XF24067	Piston Assembly (WBP)
XF26495-00	Piston Assembly (NBP)
XFR1	Riser Tube c/w 1" Dist
XF24271	Seal & Spacer kit
XF18826	Timer Motor 24v
XF13381	Drive Motor 24v
XF24218/24	Timer Assy (7 day) 24v
XF24219/24	Timer Assy (12 day) 24v

14.2 2850 Valve

PART NO.	DESCRIPTION
XF25155	Piston Assembly (WBP)
XF26494-00	Piston Assembly (NBP)
XF23739	Riser Tube c/w 50mm Dist
XF25156	Seal & Spacer kit
XF18826	Timer Motor 24v
XF13381	Drive Motor 24v
XF24218/24	Timer Assy (7 day) 24v
XF24219/24	Timer Assy (12 day) 24v

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14.3 3150 Valve

PART NO.	DESCRIPTION
XF25710	Piston Assembly (WBP)
XF26496	Piston Assembly (NBP)
TD2450-TM	Riser Tube c/w Dist System
XF18022	Seal & Spacer kit
XF18826	Timer Motor 24v
XF16501	Drive Motor 24v
XF24218/24	Timer Assy (7 day) 24v
XF24219/24	Timer Assy (12 day) 24v

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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: BIRM FILTER WITH FLECK 24 VOLT 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
Director

Hitchin, England 01/01/2006
Issue place & date