

Filtration Media Systems – IRF Iron Removal



Many surfaces and bore water supplies contain appreciable amounts of dissolved iron and occasionally manganese. On contact with air, dissolved colourless iron is oxidised to form insoluble iron oxide which appears as a red-brown sediment or stain. If manganese is present in the water, it will form brown-black sediments and stains. Iron and manganese stains cannot be removed by common soaps or detergents and build-up over time in pipes, water tanks, taps, irrigation systems and pressure tanks. Chemical cleaning may be required to remove these stains or build-up of oxidised material from the internal surfaces of pipes and tanks.

IRF systems use an advanced catalytic media to remove soluble iron and manganese from contaminated waters. An oxidiser (typically liquid chlorine or ozone) is injected into the water stream and passed into the IRF media vessel where there is then a rapid reaction between the oxidiser and any soluble iron and manganese. These contaminants are converted into their insoluble solid forms and retained in the media bed. An automatic control valve periodically initiates a filter bed cleaning cycle to flush trapped sediment to drain on a time, volume, or differential pressure basis according to the controller selected.

Media used is one of the few catalytic water filtration media certified to NSF/ANSI-61 standard suitable for drinking water treatment. Applications include bore and ground water treatment, pre-treatment for reverse osmosis and ultra-filtration systems, irrigation, household supply and stock watering.

Model	Media volume (litres)	*Service/Peak Backwash flow rate range (lpm)	Standard Flow Control Valve	In/Out Thread	Size (Dia x H)
IRF 1465	86	4-20/41/48	WS1-TC	1" BSP	14" x 65"
IRF 1665	108	5.5-26/53/63	WS1-TC	1" BSP	16" x 65"
IRF 1865	145	8-41/80/85	2850/150/293	1.5" BSP	18" x 65"
IRF-2162	187	9-45/91/108	2850/150/293	1.5" BSP	21" x 62"
IRF-2472	250	12-60/119/141	2850/150/293	1.5" BSP	24" x 72"
IRF-3072	390	19-93/186/221	150/293	2" BSP	30" x 72"
IRF-3672	600	27-134/268/318	150/293	2" BSP	36" x 72"
IRF-4872	800	50-239/478/565	150/293	2" or 3" BSP	48" x 72"

**Final sizing of IRF system will vary from published data in the table above according to required flow rate, Total Iron content of feedwater, minimum bed depth of filter media, and intended use for the treated water.*

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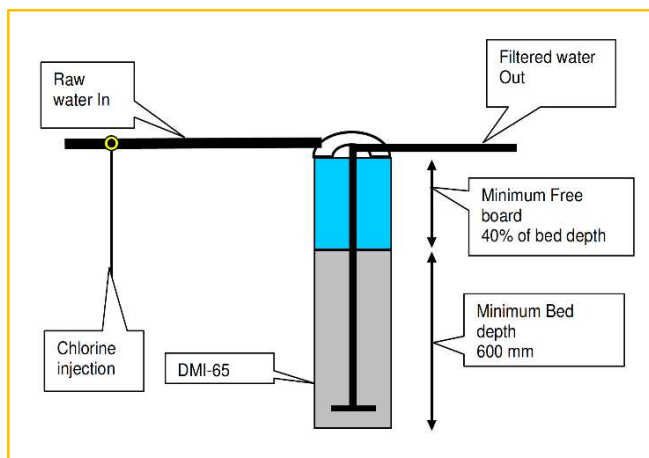
Prior to system selection, a water analysis is recommended as well as an estimate of required treated water flow rate. We can then advise of the appropriate system to best suit your application. Installation is straightforward and operation automatic.

Complete treatment systems include a chemical dosing pump and chemical storage tank, the IRF filter with media and controller, and test kits for measuring iron and chlorine levels. Alternative controllers for backwashing on volume of water treated or differential pressure across the filter media bed are also available.

Sodium hypochlorite (pool chlorine) is commonly used as the oxidising agent. This is automatically injected into the feedwater stream by a chemical dosing pump before water enters the IRF media tank. The oxidiser reacts with soluble iron and converts this to insoluble iron (Ferric hydroxide), the conversion being sped up by the action of the catalytic media. Insoluble iron is trapped in the media bed and removed through periodic backwashing based on either time, volume or differential pressure. Chlorine dosing pumps are available with different injection flow rates and we have a range of chemical storage tank between 60 and 200 litres to store the diluted oxidising agent in. Dosing pumps are generally mounted on the storage tank to simplify installation. Residual chlorine exiting the system will take some time to break down and this can be hastened by passage through activated carbon or similar or left in the treated water to sanitise the storage tank.

Ozone injection systems may also be used if higher iron levels are to be removed or a faster reaction time is required. Ozone is generated on-site as required, removing the need for any hazardous chemical storage, and handling on-site. Ozone is injected into the feedwater immediately prior to the filter media and the mode of action is the same as for chlorine. Residual ozone in the water exiting the system will rapidly break down.

We recommend fitting pressure gauges before and after the IRF media bed to monitor differential pressures across the media bed. Backwashing is generally undertaken based on either time or when differential pressure exceeds 100kPa (maximum). This can be automated using dual pressure sensors and having a differential pressure set point.



The filter media granules are porous so higher differential pressures lead to higher compaction forces being applied. Over time, the interaction between filter media particles during alternated compaction under normal service and bed expansion during backwashing leads to deterioration of media granules. Backwashing the filter when the pressure drop has increased by 50 kPa from the initial clean filter pressure drop is a good reference to minimise this. You must ensure that your pump can deliver sufficient water flow to effectively backwash the filter media. Backwashing with treated water is recommended for best results.

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Flow Control Valve Options

Standard media pressure vessels used for filtration systems have 2.5", 4" or 6" top openings for installation of flow control heads and pipework. Flow control valves may be manual or automatic, electrical, or non-electric, and functions may be initiated through a simple timer, volume of water treated, or an external contact closure from a PLC, differential pressure monitor or contact closure. Choose the flow control valve and controller according to the application, required flow rates, mode of operation and FRP tank size. Some valve types are shown here and details on additional valves to suit particular applications are available by request.

CLACK WS1CI Integrated Flow Control Valve and Controller



The WS1EI multi-cycle valves are simple, easy to use timer actuated 1" softener or filter flow control valves for 6" to 21" diameter FRP tanks with 2.5"-8 NPSM FRP openings. These versatile valves are primarily designed for commercial applications requiring flow rates up to 102lpm at 103kPa pressure drop. The valve uses a 1.05" riser tube and comes with an upper bayonet type screen. Standard supply includes a bypass assembly as standard to simplify service requirements.

NOTE: The WS1EI valve has untreated water bypass during regeneration.

AUTOTROL 263 Performa Valve – 400 Series



The 263 Performa model is an automatic 3-cycle 1" Filter valve designed for larger residential and light commercial applications with higher service flow rates to 95 LPM at 103kpa drop and backwash flow rate of 76 LPM at 170kpa drop. The Performa valves are supplied complete with a 400 or 900 Series Control with transformer and have four external ports that allow the valves to be configured to suit most applications.

NOTE: The 263 valve has untreated water bypass during regeneration. Bypass valve assemblies are available to allow filter system isolation or blending operation.

AUTOTROL 150 Series – Logix 700 Series Flow Control Valve



The 150/153-316 Stainless Steel valve is a 1.5", 3-cycle filter valve designed for commercial and industrial applications with flow rates to 216lpm @ 103kPa pressure drop. The valve is 316 grade stainless steel, piston operated and is available in top or side mount formats.

NOTE: The 150 valves may be ordered with filtered water bypass or no-unfiltered water bypass configurations

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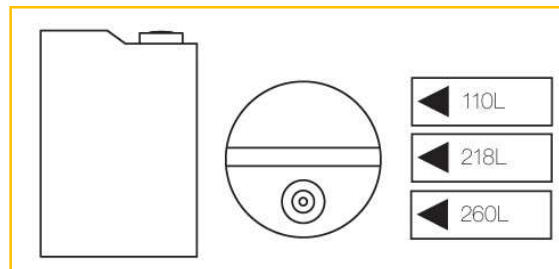
Manual Valve



Economical back-washable filter. Simply turn the rotary valve handle to backwash the filter. Complete with backwash flow control and ball valve. Ideal for sites where electric power is not available or for filtering water where minimum backwash waste is required e.g. tank water.



Chemical Dosing Pumps



Chemical Storage Tanks

Chemical tanks are translucent rotationally moulded polypropylene with a mounting surface for the dosing pump and screw lid for chemical addition.