

Industrial Pressure Filters and Softeners

Contamination Control's own range of high flow rate pressure filters and softeners for commercial, industrial and potable water applications features GRP reinforced polyethylene vessels with proven Autotrol valving and backwash control systems that are fully automatic. A minimum head of 200kPa(30psi) is required to operate and backwash the filter - more for peak flows. If pressurised water is required after the filter add the required pressure to the minimum head.

Freeflo filters are usually installed to backwash using raw water, followed by rinsing to waste. Filtered water backwashing from a parallel filter, or a filtered water storage tank, is possible. Several automatic backwash initiation options are available, all models can be backwashed manually.

Multimedia filters (AFM series)

The graded filter media includes anthracite, sand, garnet and a gravel support layer. This combination achieves particle removal down to 10-15 microns, but may not achieve turbidity removal without using a coagulant or polishing filter. As well as cleaning the media, backwashing reclassifies it and is essential for good filtration, preventing channelling and compaction. Backwash frequency can range from weekly to more than once a day depending on water quality and throughput. It is common to use head loss to automatically initiate a backwash which takes about 30 minutes. The length of the backwash and rinse cycles can be adjusted.



Anthracite



Fine sand



Fine garnet



Coarse garnet



Gravel

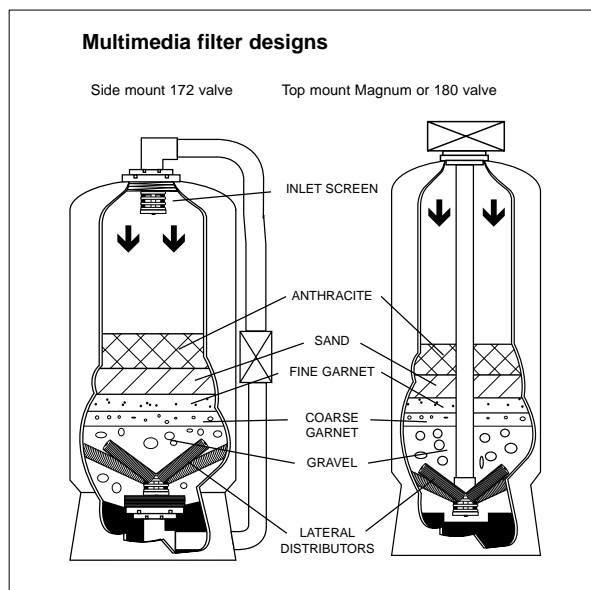
| Model | Valve options | Service flow m ³ /hr ⁽³⁾ | Peak flow m ³ /hr ⁽⁴⁾ | Backwash flow m ³ /hr | Approx. weight kg |
|----------------------|---------------|------------------------------------------------|---------------------------------------------|----------------------------------|-------------------|
| AFM14 | 180 | 3.4 | 5.0 | 3.4 | 160 |
| AFM16 | 180 | 4.5 | 6.5 | 4.4 | 225 |
| AFM20 | 180/Magnum | 6.9 | 9.6 | 6.8 | 320 |
| AFM24 | Magnum | 10.0 | 13.5 | 10.0 | 500 |
| AFM30 ⁽¹⁾ | 172/Magnum | 15.6 | 23.0 | 16.2 | 870 |
| AFM36 ⁽²⁾ | Magnum/172 | 22.6 | 32.5 | 20.5 | 1150 |

⁽¹⁾ Maximum flow rate for the Magnum valve is 22m³/hr.

⁽²⁾ An auxiliary backwash valve is required for the AFM36/172 to achieve good backwashing.

⁽³⁾ Reduced flow rates apply when using a coagulant chemical in line.

⁽⁴⁾ Reduced performance at peak, which should be short term, select service flow for continuous use.



Carbon filters (AFC Series)



Carbon

The carbon media used is high quality purification grade with a normal service life of over 5 years. The commonest application for carbon is the removal of chlorine, taste and odour from water for the food industry or other industrial process use. Flow rates are based on removal of a feed water chlorine level of 1mg/L. These rates would be reduced for higher levels of chlorine or for colour and organics removal. If carbon is being used to adsorb organics such as pesticides or dissolved colour, life is reduced as the contaminants cannot be backwashed off. The adsorption is not reversible under practical conditions and therefore performance should be monitored.

| Model | Valve options | Service flow m ³ /hr | Peak flow m ³ /hr | Backwash flow m ³ /hr | Approx. weight kg |
|----------------------------|---------------|---------------------------------|------------------------------|----------------------------------|-------------------|
| AFC14 | 180/268F | 3.0 | 4.0 | 2.4 | 80 |
| AFC16 | 180/Magnum | 3.9 | 4.5 | 3.0 | 110 |
| AFC20 | 180/Magnum | 6.0 | 7.0 | 5.0 | 140 |
| AFC24 | Magnum/172 | 8.8 | 10.2 | 6.8 | 240 |
| AFC30 | Magnum/172 | 13.6 | 16.0 | 10.8 | 410 |
| AFC36⁽¹⁾ | Magnum/172 | 19.6 | 23.0 | 16.2 | 500 |

⁽¹⁾ Maximum flow for Magnum version 22m³/hr

Greensand filters (AFG Series)



Greensand

The natural mineral greensand is used for the removal of iron in conjunction with continuous chlorine dosing and manganese in conjunction with potassium permanganate. It is usually the best practice to use greensand filtration between a bore and storage so that the iron (or manganese) is present as a dissolved ion. Success has been achieved with treatment after storage or even surface water however it is essential to carry out a trial to verify the performance of greensand and this is recommended for most applications.

| Model | Valve options | Service flow m ³ /hr ⁽¹⁾ | Capacity gm iron | Backwash flow m ³ /hr ⁽²⁾ | Approx. weight kg |
|--------------|---------------|------------------------------------------------|------------------|-------------------------------------------------|-------------------|
| AFG24 | Magnum/172 | 3.6 | 1370 | 6.8 | 240 |
| AFG30 | Magnum/172 | 5.6 | 2190 | 10.8 | 410 |
| AFG36 | Magnum/172 | 7.8 | 3200 | 16.2 | 500 |

⁽¹⁾ Peak flow 20% higher with possible loss of performance

⁽²⁾ Filtered water backwash advised

Filter capacity between backwashes is determined by the level of the contaminant and if a significant sediment load exists prefiltration with a multimedia filter is recommended. If some sediment is present in the water it is possible to put anthracite above the greensand as a prefilter layer but this will reduce the volume of greensand and therefore the capacity between backwashes.

Greensand is to be used with a water pH between 6.5 and 8.8.

Water softeners (AS Series)

Freeflo softeners use quality high capacity ion exchange resin to remove calcium and magnesium hardness ions from water for potable or industrial purposes. Salts of hardness ions are relatively insoluble and are the cause of limescale deposits in water systems, particularly when the water is heated or evaporated (such as in a boiler or humidifier). These scales are difficult to remove, can cause premature failure of equipment and incur energy costs. Softening replaces the calcium and magnesium ions with sodium which has only soluble salts. Removal of soluble iron is also practical with increased regeneration frequency.

A separate tank for the brine regenerant is included. Softeners are available with an optional water meter regeneration control to avoid unnecessary salt usage, however if demand is steady time controlled regeneration is appropriate.



Softener resin

| Model | Valve options | Max capacity gm CaCO ₃ ⁽²⁾ | Salt use per regen kg ⁽³⁾ | Service flow m ³ /hr | Peak flow m ³ /hr ⁽⁴⁾ | Backwash flow m ³ /hr | Approx. weight kg |
|---------------------|---------------|--------------------------------------------------|--------------------------------------|---------------------------------|---------------------------------------------|----------------------------------|-------------------|
| AS14 | 180 | 5500 | 20 | 3.5 | 5.6 | 1.1 | 160 |
| AS16 | 180 | 7000 | 24 | 4.5 | 7.0 | 1.4 | 200 |
| AS20 | 180/Magnum | 10500 | 36 | 6.9 | 10.0 | 2.4 | 260 |
| AS24 | Magnum | 21000 | 61 | 12.0 | 18.0 | 3.3 | 450 |
| AS30 ⁽¹⁾ | Magnum | 31000 | 96 | 18.0 | 24.0 | 4.9 | 750 |
| AS36 ⁽²⁾ | Magnum/172 | 42000 | 144 | 24.0 | 36.0 | 7.5 | 980 |

⁽¹⁾ Maximum continuous flow rate for the Magnum valve is 22m³/hr.

⁽²⁾ To determine throughput divide capacity by raw water hardness as CaCO₃.

⁽³⁾ This figure is the maximum salt use per regeneration and in most cases will be less than this.

⁽⁴⁾ Reduced performance at peak, which should be short term, select service flow for continuous use.

The salt used in softening is stored in a tank, usually polypropylene, where the salt is automatically dissolved to make brine. This is drawn through the resin when required to regenerate the resin, recharging it with sodium ions so the ion exchange softening can resume. This process takes approximately 40 minutes and at the end the control valve refills the brine tank to dissolve more salt. The operator simply has to ensure that solid salt is present in the brine tank so that the brine solution is always saturated. Contamination Control supply a washed grade of coarse salt ideal for softening use. The calcium and magnesium ions are flushed to waste during regeneration.



Coarse salt

Nitrates are a problem in some groundwater supplies used for drinking, usually in agricultural areas where fertilisers have contaminated the groundwater. Using a nitrate specific ion exchange resin and regenerating using the chloride component of the salt is effective in removing nitrate, without adding to the sodium level.

| Valve connections | 268F | 180 | Magnum | Magnum Plus | 172 |
|-------------------|------|-----|--------|-------------|-----|
| Inlet mm | 25 | 40 | 40 | 50 | 50 |
| Outlet mm | 25 | 40 | 40 | 50 | 50 |
| Drain mm | 10 | 20 | 40 | 40 | 40 |

| Filter specifications | |
|--------------------------------|-----------------|
| Temperature | 5-50°C |
| Power | 230V, 3W |
| Height | Up to 2.4m |
| Power consumption | 5 Watts |
| Power supply 180 and 172 valve | 230 Vac |
| Power supply Magnum and 268F | 12 Vac |
| Max pressure | 850kPa (125psi) |

Valve features and options

All valves can be supplied with timer control for time/day backwash initiation, impulse control for external contact closure initiation (eg head loss or batch control) or throughput control with a turbine included for flow metering. Timers are available with 6, 7 or 12 day clocks depending on the valve used. For example a 7 day clock would allow regeneration to be skipped at weekends while a 12 day clock permits regeneration daily, every second or third day, etc.

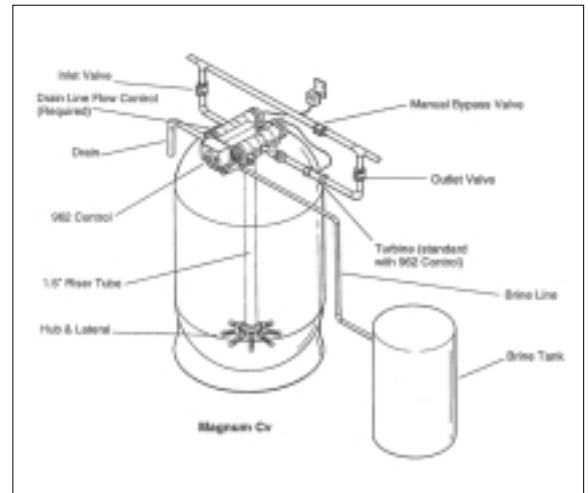
172 and Magnum valves have a hydraulic signal available during backwashing, an electrical contact closure is optional. The 180 valve has an electrical contact closure available during the backwash. These signals can be used to operate a valve, stopping downstream water flow during a backwash ensuring full flow is available for the backwash. The Magnum valve is available in versions that either allow unfiltered water to bypass to service or stop any bypassing, whichever suits the process requirements. The 268F valve has an optional electrical contact that changes state during the backwash.

Typical Magnum Valve Installation



Installation space requirements

Smaller units up to 24" models (AFM24 - 600mm dia) require up to 1m² area for good access, allow 1.5m² for larger models. Access is needed front and rear except for 172 valves. Softeners require an additional 1m² to allow for the brine tank.



Installation Notes

1. The control valve is shipped as a sub-assembly to avoid damage in transit.
2. Install a pressure reducing valve if pressure is near to or greater than 850kPa.
3. Install a water hammer arrestor if water hammer is likely.
4. Media is supplied separately bagged for loading after installation of the filter vessel.
5. The service flow rate is the highest flow rate at which optimum performance can be expected. It should be the greatest flow rate at which the filter is required to operate for a sustained period.
6. Allow for drainage of the design flow rate for up to 30 minutes during backwashing.
7. Magnum, 180 and 268 valves are top mounted, the 172 valve is usually side mounted.
8. At maximum flow rates the pressure drop across the filter will be 15-25psi. At low pressure maximum flows or even service flows may not be achievable - consult CCL for a recommendation.
9. All piping should be supported independently of the filter.
10. Install manual isolating valves and a bypass valve to permit removal of the valve for service.
11. Load media after pressure testing installation, allow 3m height for loading.
12. Allow media to soak after installation (24 hours for carbon).



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