Water Treatment

Engineering & Construction

Filtration
FAD Mod.

Rev 06/01

FAD deferrization, demanganization filters

OVERVIEW

FAD deferrization, demanganization filters allow to remove from the water the iron and manganese in a non-oxidised form. FAD filters are usually used before a preliminary oxidation treatment, with air or more frequently, with sodium hypochlorite, or other oxidising agents (e.g. potassium permanganate)
The initial oxidation stage allows, in presence of iron, the oxidation from Fe^{2+} to Fe^{3+} that precipitates as hydroxide. The removal of manganese is through a catalytic process following an in-line chlorination. The oxidation of the soluble manganese is through free chlorine by the catalytic action of the mineral granules in the filter bed. FAC active carbon filter is used for the removal of the exceeding remaining chlorine, at the bottom of the FAD filter.
The selection of the filter bed, composed by a mix of catalytic acting minerals and suitable inert particles, has been studied in order to guarantee the contact time required for an efficient removal of iron and manganese. Periodic filter washing (backwashing with water and final washing) enables the expulsion of the retained impurities and clearing the filter bed.

APPLICATIONS

- Weel water filtration
- Iron removal
- Manganese removal

NOTE: A complete analysis of the water to be treated is necessary, in order to guarantee reduction of iron and manganese under legal admissible limits

WORKING DATA

➢ Operating pressare min/max	2,5/5	bar
➢ Project/testing pressure	5/7,5	bar
➢ Backwashing pressure	1,5	bar
➢ Water temperature range	3÷40	°C
➢ Electric power voltage/frequency	220/50	V/Hz
➢ Electric absorption	20	W
➢ Load losses with blocked filter (values read at pressure gauges) medium/high low	0,8/1,3	bar
➢ Service station for valves control	5-7	bar

CONSTRUCTION CHARACTERISTICS

Models from FAD 45(1) to FAD 160

- Tank: vertical cylindrical in electro-welded carbon steel with convex bottoms, complete with 2 inspection hatches for loading filtering media, supplied in bags. The interior and exterior tanks are sanded to a finish class of SA 2.5. The internal surface is subsequently treated with a coat of epoxy food paint to obtain a total dry film of 250 μm. The external surface, after a coat of epoxy base, is protected with epoxy base paint RAL 3020.
- Water distribution system: the lower distributor comprises a robust filter-nozzle star with calibrated holes in PVC/PP. The upper section is fitted with a flow break disk with a calibrated design.
- Automatic valves: butterfly type in painted cast iron, lens in nodular cast iron, double pneumatic actuator with relative solenoid valve. On FAD 45 and FAD 55 models, the valves are membrane type with pneumatic control.
- Filter piping in AISI 304 stainless steel, flat stub in AISI 304, flanges in hard aluminium.
- Pressure gauges diameter 63 mm, scale 0-10 bar, complete with pressure gauge holder valve and test point.

Models from FAD 180 to FAD 250

- Tank: vertical cylindrical in electro-welded carbon steel with convex bottoms, complete with 3 inspection hatches for loading filtering media, supplied in bags. The interior and exterior tanks are sanded to a finish class of SA 2.5. The internal surface is subsequently treated with a coat of epoxy food paint to obtain a total dry film of 250 μm. The external surface, after a coat of epoxy base, is protected with epoxy base paint RAL 3020.
- Water distribution system: the lower distribution system comprises a nozzle plate complete with nozzles and calibrated outlets secured with locknuts. Upper distribution is guaranteed by a central conveyor which terminal section is an upturned truncated cone form.
- Automatic valves: butterfly type in painted cast iron, lens in nodular cast iron, double pneumatic actuator with relative solenoid valve.
- Filter piping in AISI 304 stainless steel, flat stub in AISI 304, flanges in hard aluminium.
- Pressure gauges diameter 100 mm, scale 0-10 bar, complete with pressure gauge holder valve and test point.

OPTIONS
PVC filter piping is also available, with PVC pneumatic control valves (FAD-PVC Model)

AUTOMATION

- Filter operation and washing cycle are ensured by solenoid valves, pneumatically connected to the valves on the filter piping, and electrically powered by a PLC fitted with an operator panel and display.
- The solenoid valves and PLC are inserted in a small panel in anti-corrosion material with IP55 protection rating.
- Operating times, backwashing and final washing are adjustable as required according to the effective working conditions.
- Voltage-free contacts are available for an external permissive.
- Start-up can also be manual.

FILTRATION MEDIA

The filter bed is composed by a mix of catalytic material and quartziferous sand. Inert particle size guarantees a constant materials distribution inside the filter bed. Only in this way maximum contact time is obtained between the water and catalytic material optimising the removal of iron and manganese. Under the filter bed one or more inert layers are envisaged (quartziferous sand) active carbon layer with an high porosity and a very high active surface.

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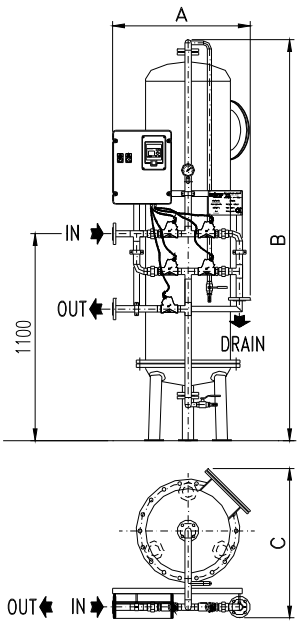
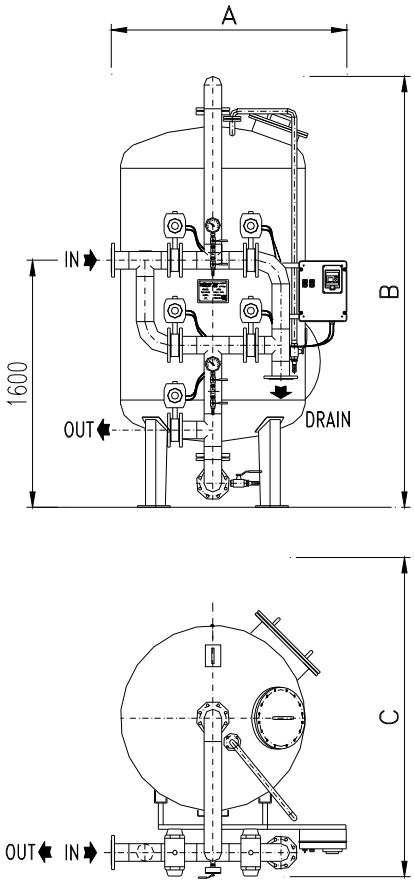
FAD 45 – 55[1]

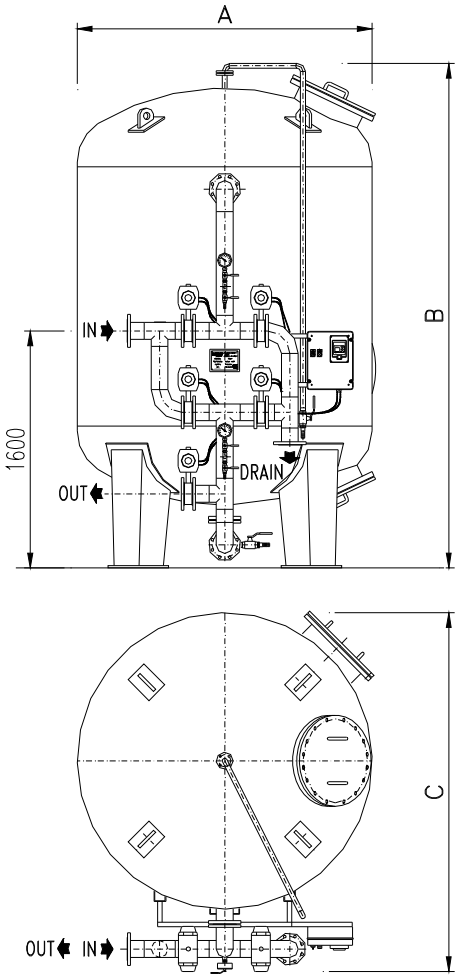


[1] **NOTE:** For FAD 45 and FAD 55 models, an upper manhole and flanging of the convex bottom below the plating are envisaged

FAD 65 - 160



FAD 180 - 250



TECHNICAL DATA

Model	Flow Rates	
	Operating v = 10 m/h	Back washing
	m^3/h	m^3/h
FAD 45	1.6	4.0
FAD 55	2.4	5.9
FAD 65	3.3	8.3
FAD 80	5.0	12.6
FAD 100	7.9	19.6
FAD 120	11.3	28.3
FAD 140	15.4	38.5
FAD 160	20.1	50.2
FAD 180	25.4	63.6
FAD 200	31.4	78.5
FAD 220	38.0	95.0
FAD 240	45.2	113.0
FAD 250	49.1	122.7

NB: - For constructional reasons dimensions and weights are not binding.
- The company holds the right to modify the technical and aesthetic characteristics of each equipment.

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