

# Side Stream Filter Engineering Specifications

## Excalibur Water Systems Model EWS FSC2MQC4AG14SS5 Quadplex System Controlled Side Stream 5-micron Filter Electronic Metered Service Operation

Supply one (1), only Excalibur Water Systems Model EWS FSC2MQC4AG14SS5 Quadplex System Controller Side Stream 5-micron Filter. The system shall be designed to operate under pressure from 40 psig (minimum) to 110 psig (maximum).

**Mineral Tank:** Supply four (4), 30" diameter x 72" high 6.0" top flange opening premium quality PE liner with FRP filament winding mineral tank. Maximum operating pressure up to 150 psig with a maximum operating temperature of 120°F. Mineral tank must be NSF/ANSI Standard 44 as well as PED certified.

**Collection & Distribution:** Supply four (4), 2.0" OD high impact FDA approved ABS hub and lateral high flow distributor at bottom and upper basket at top shall be utilized to evenly collect and distribute the flow of water over the entire bed.

**Control Valve:** Supply four (4) main operating 2" quick connect control valve shall be made of epoxy coated lead free brass and all wetted parts shall be non-corrosive. The control valve must have a quick connect style base with hinged clamp to allow for quick connect or disconnect to the 316 Stainless Steel 4" base adapter. The drain port consists of a 1.5" FNPT receives a 1.5" flow control adapter. The distributor pilot for the control valve is 2" NPS pipe. Control valve utilizes a remote inline electronic flow meter with Hall Effect sensor which must be installed on the outlet port of the control valve. Control valve will have a single main piston, patented 1-piece compressible seal/ spacer stack assembly. Valve must be a top-mount design with a 12-volt electronic microprocessor controller. Control valve shall have fully adjustable regeneration cycle duration times for backwash, fast rinse and return to service. The control valve must also be certified to NSF/ ANSI 61 and NSF/ ANSI 372.

**Microprocessor Controller:** The solid state microprocessors shall have a coin cell lithium battery for 8-hour time of day up keep. Microprocessor will have front panel displays to show current time of day, volume remaining, current flow rate, a system totalizer and days to regeneration if day over ride is programmed (availability range of 1 day to 28 days). The controller will allow for five methods to initiate regeneration; meter immediate, meter delayed, time clock delayed, or pressure differential delayed or immediate. It shall provide operating history for days since last regeneration, gallons used since last regeneration, total days in service, and total number of regenerations since it was installed which will all be stored in non-volatile memory. The relay output shall be provided controlled by the microprocessor to allow output signal based on time, error logged, a specific regeneration cycle window or volume of processed water from the meter output signal.

**Skid Frame:** Supply one (1), only blue powder coated carbon steel free standing frame. The frame shall be equipped with stands on four corners to fasten with floor. The pump, inlet piping and controller shall be fastened on frame.

**Booster Pump Control System:** The booster pump is centrifugal pump which shall be assembled on a skid to boost the inlet pressure for proper filtration. The pump shall be 10.0 HP powered with 460 VAC 3 phase with 14 amperes at full load. The booster pump must be logic controlled by control valve, inlet pressure switch and outlet/boost pressure switch to maintain the optimum pressure in the feed line of filter. The pump logic control system shall be powered with 12V DC current. The pump shall be able to provide the boost pressure of 40psi at the flow rate of 196gpm.

**Pump Inlet Pressure Switch:** Supply one (1), pump inlet pressure switch shall be able to trigger the single pole double throw switch fully adjustable range from 2.0 to 15.0 psi and can withstand the maximum pressure of 500.0 psi. Electrical current rating shall be 15 amperes at 120/240/480V AC. This pressure switch shall be able to switch off the pump in condition of no inlet water supply. The switch shall be CE, cUL and UL approved.

**Pump Outlet/Boost Pressure Switch:** Supply one (1), pump outlet/boost pressure switch shall be able to trigger the single pole double throw switch fully adjustable range from 58 to 130.5 psi and can withstand the maximum pressure of 145 psi. Electrical current rating shall be 21 amperes at 125/250 VAC. This pressure switch shall be able to switch off the pump to control boost pressure and protects the plumbing and filter components.

**Differential Pressure Switch:** Supply four (4), differential pressure switch shall be able to initiate the regeneration at fully adjustable differential pressure from 10 to 25 psi between the inlet and the outlet ports of control valve. The high pressure port shall be threaded to outlet sample port and low pressure port at inlet sample port of control valve. The electrical current rating shall be 5 amperes at 30 VDC. The switch shall be CE and UL approved.

**Pressure Relief Valve:** Supply one (1), only bronze body safety relief valve. The relief valve shall have 1.5" FNPT ports for inlet and outlet. The pressure relief valve shall release the pressure at 100psi to the drain. The valve shall be ASME section IV certified.

**Motorized Alternating Valve:** Supply four (4), only 2" NPT full ported motorized alternating valve made of epoxy coated lead free brass. This allow unit to be regenerated by separate source water or filtered water and again uses the unfiltered water during service operation. Its internal non-corrosive single piston & patented 1-piece compressible seal/ spacer stack assembly allow it to be hydraulically balanced. The MAV has a sight glass that allows you to view the position of the valve to know which valve is on-line and which is on stand-by without removing any covers. This motorized alternating valve must be certified to NSF/ANSI 61 and 372.

**No Hard Water Bypass Valve:** Supply four (4), only 2" full ported made of 316 stainless steel no hard water bypass valve which prevents the raw water bypass during the regeneration cycle. Its internal non-corrosive single piston & patented 1-piece compressible seal/ spacer stack assembly allow it to be hydraulically balanced. The no hard water bypass has a sight glass that allows you to view the position of the valve to know whether the unit is on-line or on stand-by without removing any covers. This no hard water bypass valve must be certified to NSF/ANSI 61 and 372.

**Turbine & Volumetric Meter:** Supply four (4), only 2" Male X Female NPT made of 316 stainless steel meter with magnetic pulse Hall Effect turbine remote meter accuracy must be +/- 5% with a flow rate range of 1.5 – 150.0 GPM. Other meters will not be accepted. This meter must also be certified to NSF/ANSI 61 and 372.

**Filter Media:** Excalibur Turbidity media shall be a natural zeolite with high sediment removal capacity. The media shall have a mesh size of 14x30 with effective size of 0.55mm. Hardness must be 4-5 at Mohs Scale and must provide wide pH range to the maximum temperature of 140°F. The media shall be NSF 61 certified.

**Flow Rate:** Continuous flow rate of filtered water may be drawn at a service flow rate 196.4 GPM (12.39 l/s), and a peak flow rate up to 245.6 GPM (15.50 l/s).

**Drain Flow Rate:** Water shall be discharged during the regeneration process at a flow rate of 74.0 GPM (4.67 l/s) for proper regeneration bed expansion process.

**Start-up:** Successful equipment provider shall follow the manufactures printed instructions to start up the system after plumbing and electrical requirements are completed. This includes raw water testing, programming, individual start-up for each filter column, system operation, and product water testing for each column and training of personnel. Set system for differential pressure operated immediate regeneration. If needed, the successful bidder shall contract an approved authorization service agent from the manufacture to assist with these procedures.

**Warranty:** Equipment and /or parts shall be covered by manufacturer's replacement warranty as follows:

- Fiberglass Mineral Tanks – TEN (10) YEARS
- Filter Media – TEN (10) YEARS
- Control Valves, MAV and NHWB - FIVE (5) YEARS
- All other components – ONE (1) YEAR