

Alternating Duplex Demand (Model 122 Control Panel)

Manufacturer: SJE Rhombus

Model:

- 1221W914X (115 V)
- 1221W114X (115/208/230 V)

Phase: Single

Number of Pumps: 2

Float Tree(s) Required: One 3-Float Tree

Electrical Schematic Available at:

www.waterloo-biofilter.com → Products → Control Panels → Alternating Duplex Demand

Dosing Type: Alternating Demand

Typical Applications:

Dosing to Disposal for Large Configurations (> 3000 L/d)

Operational Description

In this operation, 2 pumps placed in the same chamber take turn pumping water down on a demand basis. The pumps alternate after each dosing sequence. The duplex (2 pumps) dosing unit provides a safety factor in case one of the pumps fails. It also prolongs the service life of each pump.

The disposal bed polishes the Biofilter effluent by aerobic processes. To ensure optimal polishing, it is crucial to keep the bed aerated and not to hydraulically overload the bed. These could be accomplished by dosing intermittently and balancing flow to the bed. Since flow entering the Biofilter treatment unit is balanced by timer-controlled pumps, flow from the Biofilter to the chamber for disposal is consequently intermittent and balanced. Flow entering the chamber does not need rebalancing and is pumped to the disposal bed on demand.

Typically, a Model 122 panel requires 3 float switches (3-float tree) for operation. They include (from lowest to highest in elevation):

1. *Stop float* (Turns both (LEAD & LAG) pumps off)
2. *Lead float* (Starts LEAD pump)
3. *High Water Alarm/Lag float* (Activates audible and visual alarms/starts LAG pump)

The *Stop float* ensures that the pumps are completely submersed in water for adequate cooling. When this switch drops, both pumps turn off. The *Stop float* should be clamped to 12" from the bottom of the pump chamber.

The *Lead float* turns on the leading pump. This pump stays on until the *Stop float* drops, upon which the two pumps swap duty assignment (i.e. LEAD pump becomes the LAG pump and vice versa). The *Lead float* should be clamped to above the *Stop float*. The height of this float will depend on:

- a) Required dose volume to disposal area
- b) Size of the disposal pump tank (volume and surface area of the floor)

The following is an example of how to calculate the height in which the *Lead float* should be mounted.

Example – Determining Where to Clamp LEAD Float

Given

- Tanks Dimensions (W x L x H): 1m x 3m x 1m
- Volume Dose to Disposal = 500L
- Volume of Pipe Fill = 100L

Calculations

- Total Dose Volume = 500L + 100L = 600L
- Volume of Tank = 1m x 3m x 1m = 3m³ = 3000L
- Depth of Tank = 1m = 3.2808' = 40"
- Volume per inch = 3000L / 40" = 75L per inch
- Inches to achieve a dose of 600L = 600L / 75L per inch = 8"

Solution

To achieve a 600L dose, the *Lead float* must be clamped 8" above the *Stop float*.

The *High Water Alarm/Lag float* notifies the operator of a high water level in the tank. When this switch rises for more than 2 seconds, it activates the audible and visual alarms. The float also turns on both pumps (LEAD & LAG) to prevent water from

overflowing the tank. Both pumps stay on until the *Stop float* drops low, at which point, both pumps are turned off.

The *High Water Alarm/Lag float* should be clamped to $\frac{3}{4}$ the height of the pump chamber from the bottom of the chamber. This is a safety factor to provide time for the operator to investigate and react to the problem before outbreaks occur.

3. High Water Alarm / Lag

High Position (>2 seconds)
Turns ON audible and visual alarm and turns ON both pumps

Low Position
Turns OFF audible and visual alarm and turns OFF both pumps

57"

1. Stop

High Position
Nothing happens

Low Position
Turns OFF pump

varies with tank size

13"

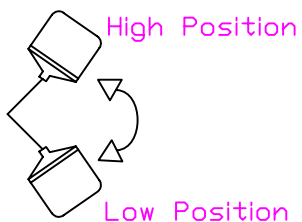
2. Start

High Position
Turns ON pump

Low Position
Nothing happens

varies with tank size

Legend



Alternating Duplex Demand Float Tree