

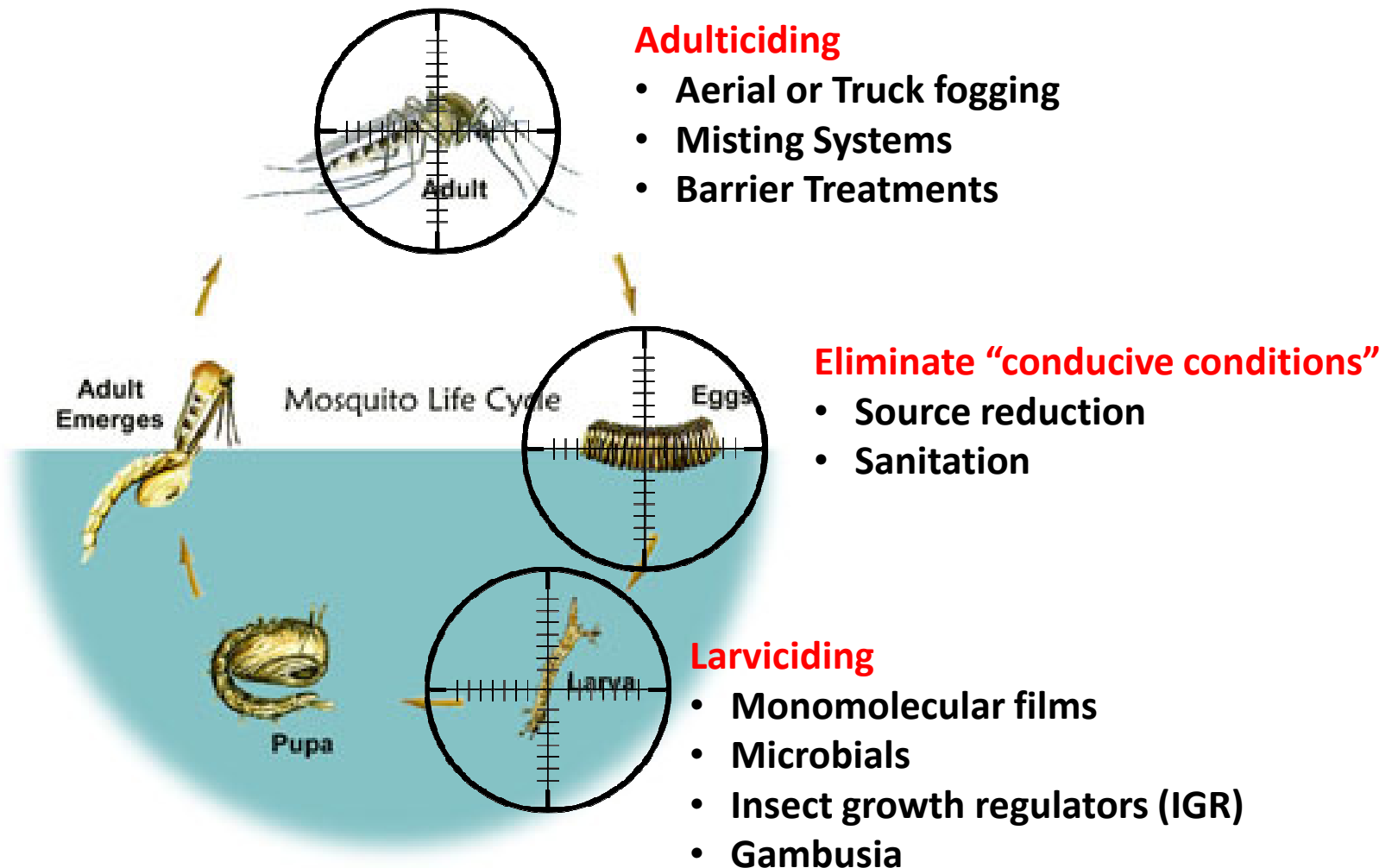


# Study Materials

- 1.0 Understanding the Enemy
- 2.0 Fundamentals of Misting
- 3.0 MistAway's Equipment
- 4.0 Mosquito Misting System Design
- 5.0 Managing Concentrates
- 6.0 Installing the Nozzle Circuit
- 7.0 Working with the Misting Units
- 8.0 iMistAway

## 1.0 Understanding the Enemy

# Mosquito Life Cycle and Control Measures



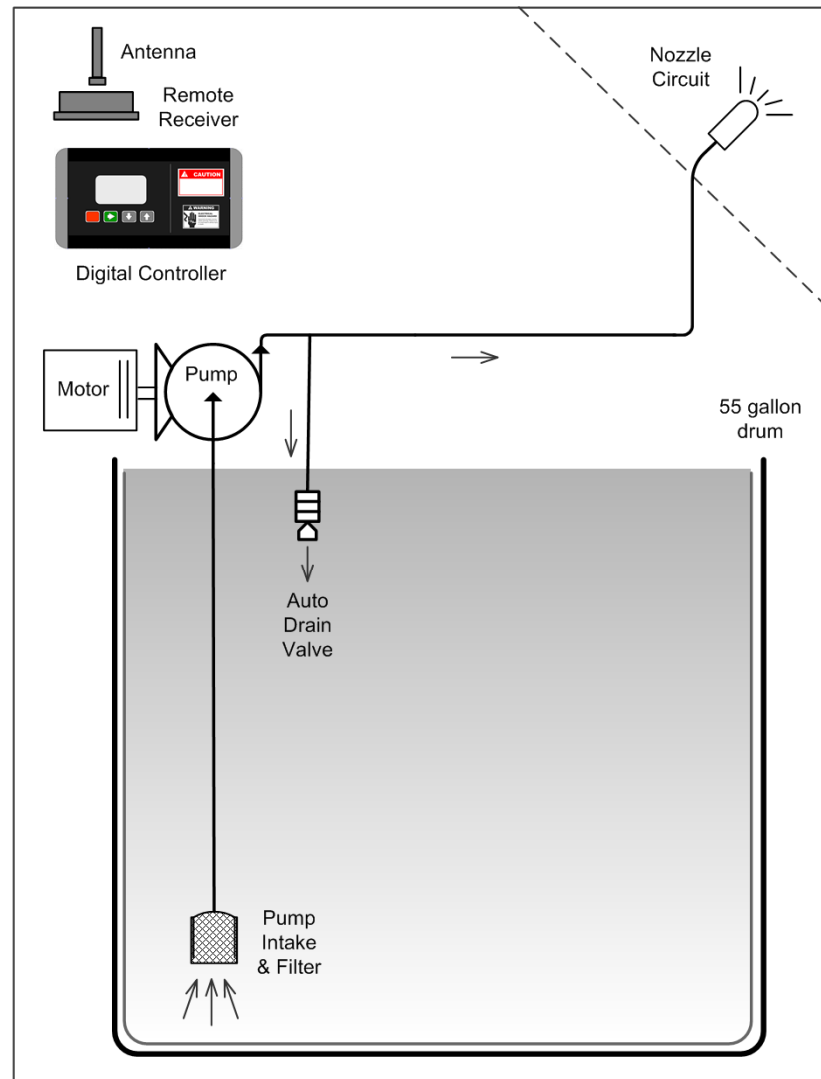
## *2.0 Fundamentals of Misting*

# **Pressure Engineering Rules**

1. Adjust the pump bypass to produce 250 psi at the unit, never higher.
2. Each nozzle should operate in the Target Misting Zone, between 200 – 250 psi and mist 40 – 50 ml per minute.
3. Tee the nozzle circuit as close to the pump as possible and divide the flow.
4. Don't install any more than 35 nozzles in a single run of ¼" tubing.
5. If you have to put more than 35 nozzles on a run, use a parallel 3/8" line to boost the pressure at the middle of the run.
6. Try to loop the nozzle circuit if the nozzle runs from the pump are very different in length and nozzle count.
7. For runs greater than 30 feet with no nozzles, use 3/8" tubing instead of ¼" tubing.

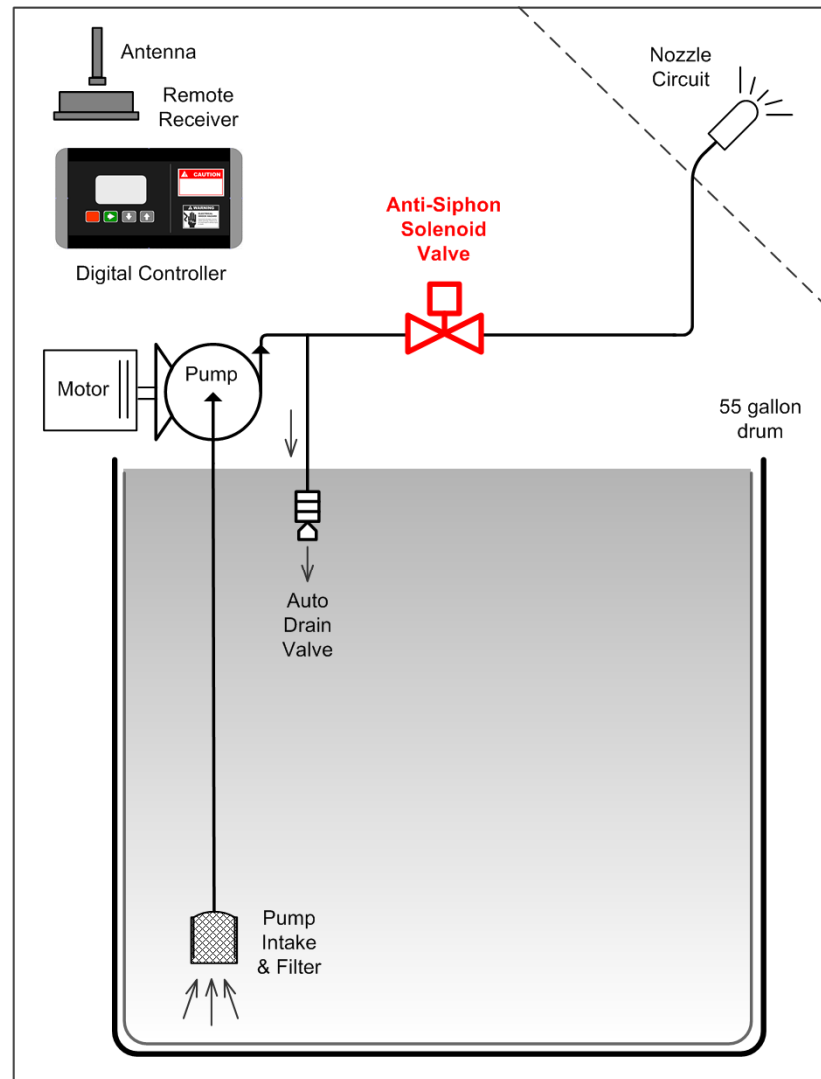
### 3.0 MistAway's Equipment

# Non-agitated Gen 1.3 Drum Unit



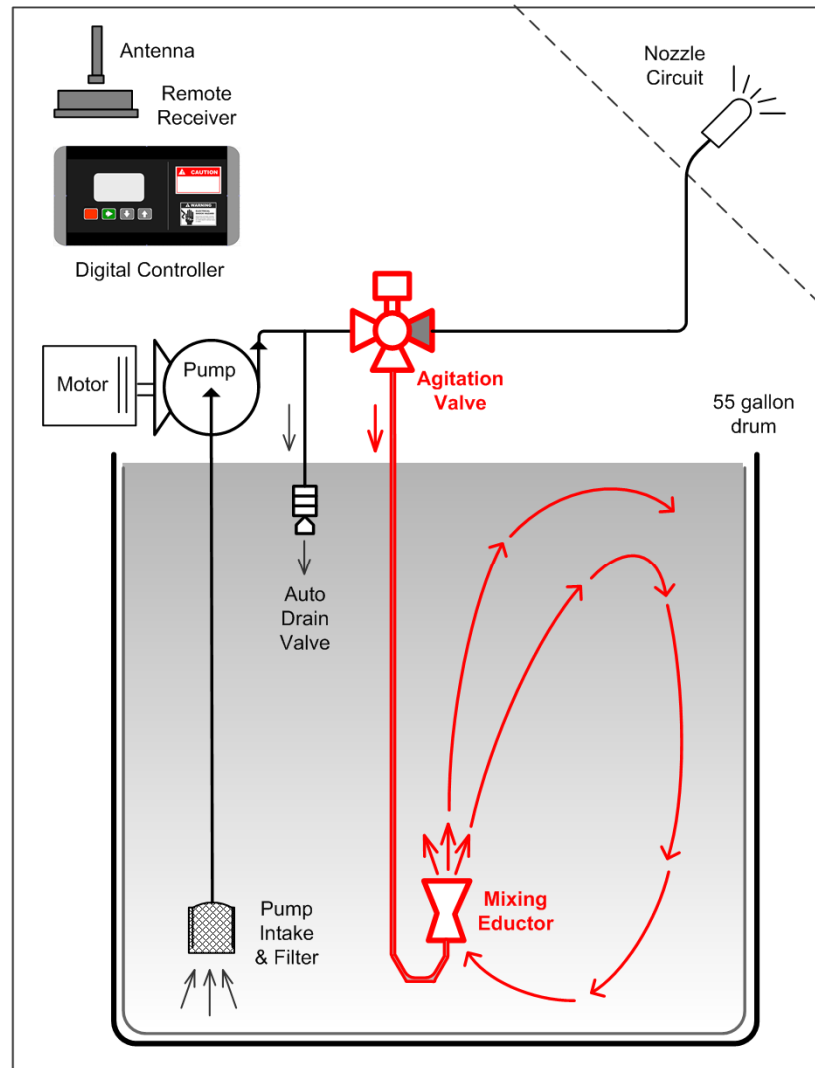
### 3.0 MistAway's Equipment

## Non-agitated Gen 1.3 Drum Unit With Anti-siphon Valve



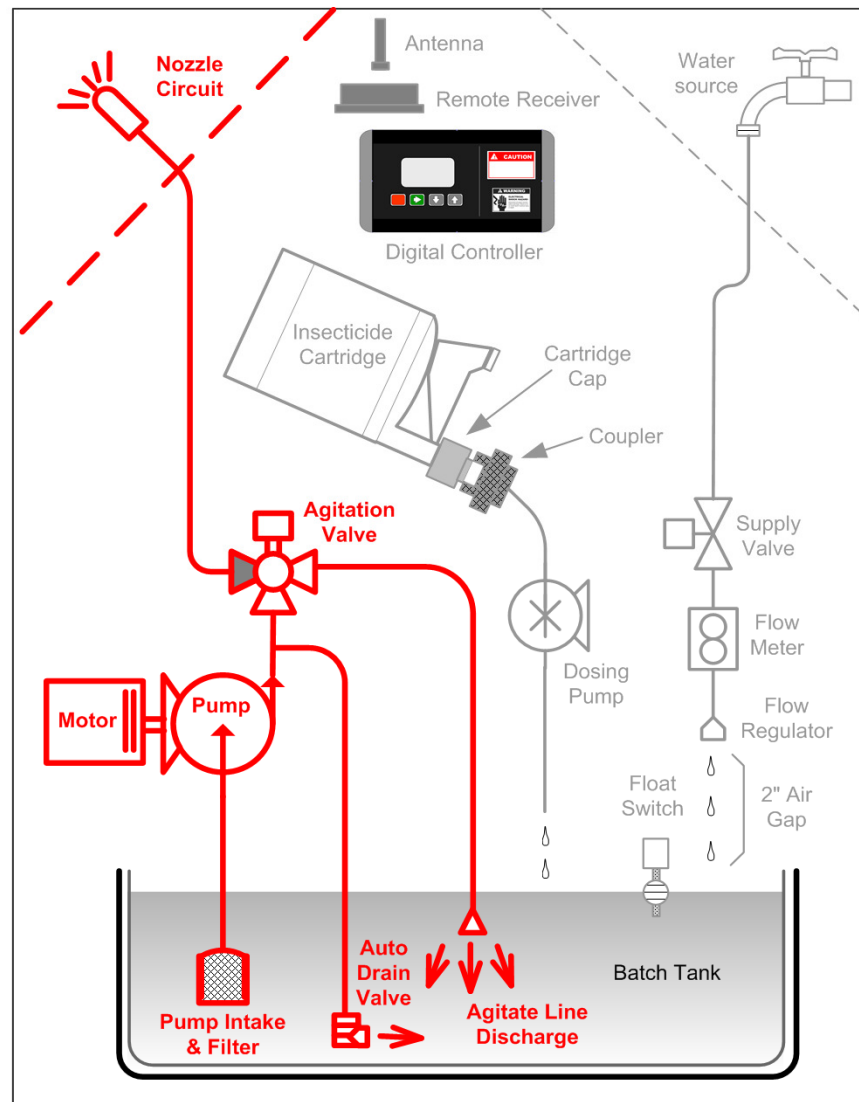
### 3.0 MistAway's Equipment

# Agitated Gen 1.3 Drum Unit



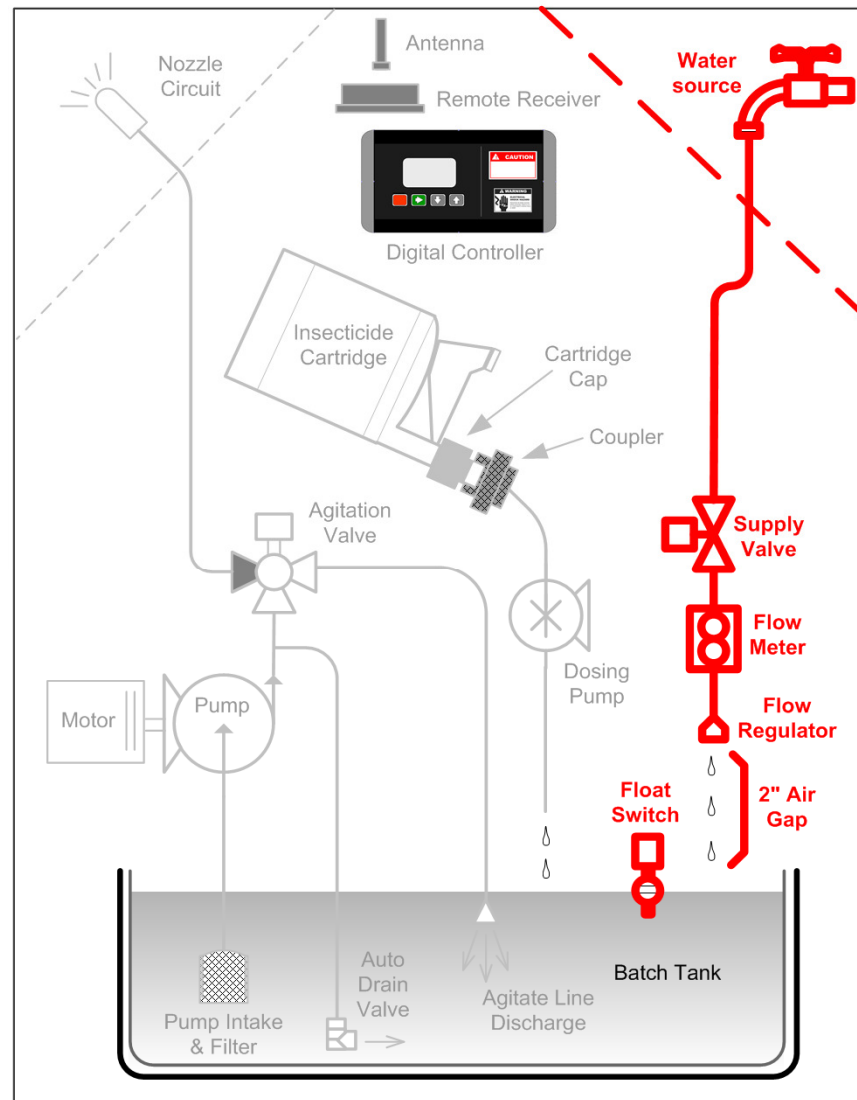
### 3.0 MistAway's Equipment

# Gen III+ Tankless Unit (Misting Sub-system)



### 3.0 MistAway's Equipment

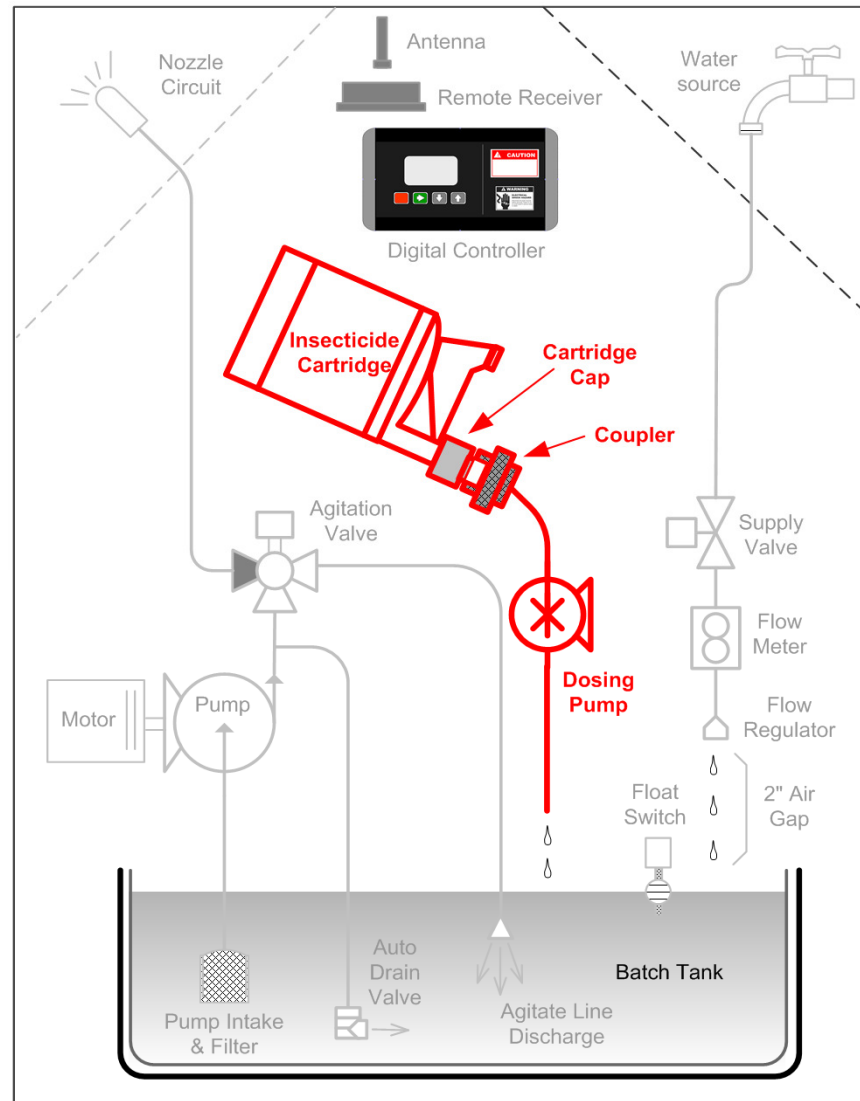
## Gen III+ Tankless Unit (Fresh Water Sub-system)





### 3.0 MistAway's Equipment

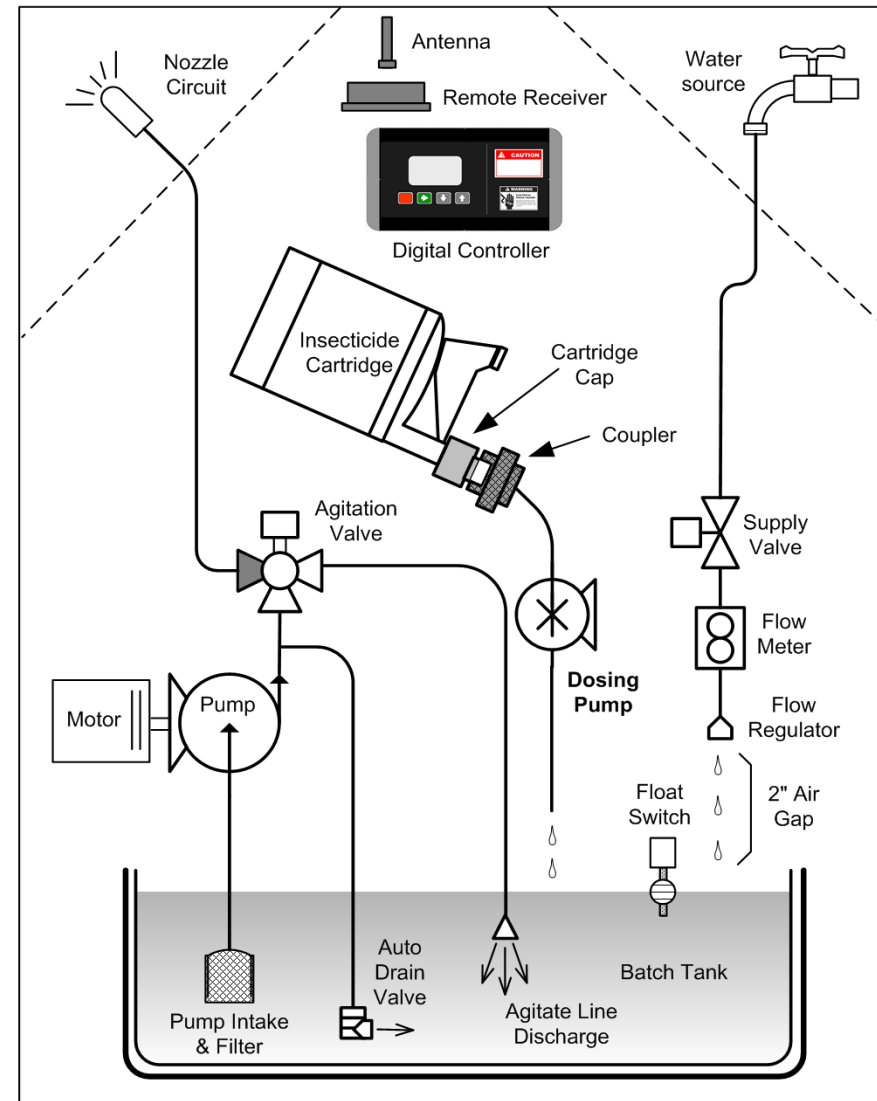
# Gen III+ Tankless Unit (Concentrate Sub-system)



### 3.0 MistAway's Equipment

## Gen III+ Batch Makeup (After Mist Cycle)

1. Controller opens Supply Valve.  
Fresh water flows into Batch Tank.
2. Float Switch floats. Supply Valve closed.
3. Controller reads Flow Meter for  
water volume into tank.
4. Controller calculates insecticide  
requirement and length of dose  
cycle and activates dosing pump.
5. Controller initiates agitation cycle.



## **System Design Process**

- 1. Survey property and conceptualize nozzle circuit path**
  - Envision “Perimeter of Protection”
  - Consider wind drift
  - Identify need for interior nozzles
  - Identify areas requiring extra treatment
  - Recognize features requiring special consideration
- 2. Identify nozzle locations and “transitions”**
  - Fences or walls, structures, trees, landscape risers
  - Ground to Eave, Tree and Fence
- 3. Decide where to place the unit** – flat, accessible, sheltered location, with access to water and power
- 4. Create scaled drawing of installation plan** – develop proposal, configure order, plan other materials, communicate with installers
- 5. Test design against Pressure Engineering Rules** - modify design if necessary

## *4.0 System Design*

# **System Design Guidelines**

1. Design a “perimeter of protections.”
2. Place nozzles ten feet apart.
3. Consider the prevailing wind.
4. Use interior nozzles if the perimeter is large.
5. Place nozzles 8 feet apart in areas requiring more treatment.
6. Don’t put nozzles too near the water, koi ponds or on or near jungle gyms or swing sets.
7. Avoid installing nozzles over 10 feet high.
8. Avoid installing nozzles at the top of a fence.
9. Place landscape risers at least two feet from plants.
10. Protect tubing in ground transitions with conduit.
11. Place the unit on a flat surface near water and power, so it is accessible and protected from rain and sprinklers.

## 5.0 Managing Insecticides

# Active Ingredient Comparison

	<i><b>Pyrethrins</b></i>	<i><b>Permethrin</b></i>
<b>Chemistry and Source</b>	<ul style="list-style-type: none"> <li>• Botanical extract</li> <li>• Found in pyrethrum, the extract from parts of a chrysanthemum flower</li> <li>• Chemical “cocktail” of 6 closely related molecules</li> </ul>	<ul style="list-style-type: none"> <li>• Synthetic compound</li> <li>• Consists of single molecule</li> </ul>
<b>Common Products</b>	<ul style="list-style-type: none"> <li>• Indoor bug bombs or foggers</li> <li>• Human head-lice treatments</li> <li>• Pet flea sprays</li> </ul>	<ul style="list-style-type: none"> <li>• Same as pyrethrins, plus</li> <li>• Ornamental garden and turf products</li> <li>• Repellent/insecticide for clothing</li> </ul>
<b>Mode of Action</b>	<ul style="list-style-type: none"> <li>• Broad Spectrum – affects many different insects</li> <li>• Nerve toxin – inhibits sodium channel function</li> <li>• Commonly synergized with PBO at 1:5 or 1:10</li> </ul>	<ul style="list-style-type: none"> <li>• Same broad spectrum as pyrethrins</li> <li>• Same Na<sup>+</sup> channel mode of action</li> <li>• Commonly synergized with PBO at 1:1</li> </ul>
<b>Effect on Insects</b>	<ul style="list-style-type: none"> <li>• Contact Activity</li> <li>• Flushes insects, causes excitation</li> <li>• Fast knockdown and kill</li> </ul>	<ul style="list-style-type: none"> <li>• Residual Activity</li> <li>• Not known for flushing</li> <li>• Slower acting</li> </ul>
<b>Stability and Persistence</b>	<ul style="list-style-type: none"> <li>• Unstable in UV light, heat, water</li> <li>• Rapid degradation</li> <li>• Unstable outside of fairly narrow pH range (5.5 – 7.0)</li> </ul>	<ul style="list-style-type: none"> <li>• Somewhat degraded by sunlight, but significantly more stable than pyrethrins</li> <li>• More stable than pyrethrins when outside of pH range</li> </ul>

## 5.0 Managing Insecticides

# Risk Profile

	<b><i>Pyrethrins</i></b>	<b><i>Permethrin</i></b>
<b>Human Health</b>	<ul style="list-style-type: none"><li>• One of the least poisonous insecticides to mammals, because they are quickly broken down into inactive forms and pass from the body.</li><li>• Inhalation can cause coughing, wheezing. Skin contact can cause rash, itching, etc.</li><li>• On EPA misting page, “EPA does not expect risks of concern to humans . . .”</li><li>• Cancer – EPA classifies as “unlikely to cause”</li></ul>	<ul style="list-style-type: none"><li>• Same as pyrethrins</li></ul>
<b>Wildlife</b>	<ul style="list-style-type: none"><li>• Highly toxic to fish and tadpoles</li><li>• Toxic to beneficial insects (butterflies, honeybees)</li></ul>	<ul style="list-style-type: none"><li>• More toxic to fish than pyrethrins but similar otherwise.</li></ul>
<b>Environment</b>	<ul style="list-style-type: none"><li>• Rapidly degraded into non-toxic breakdown products.</li><li>• Binds tightly to soil, greatly limiting ability to migrate into groundwater.</li></ul>	<ul style="list-style-type: none"><li>• More persistent in the environment, with similar binding to soil</li></ul>
<b>Potential for Resistance</b>	<ul style="list-style-type: none"><li>• Not an issue</li></ul>	<ul style="list-style-type: none"><li>• Is an issue in public control districts.</li></ul>

## *5.0 Managing Insecticides*

# **Calculator**

**Calculator (mobile-optimized)**

<http://mistaway.com/calculator/>

## **5 Universal Truths**

- 1. Consider the service consequences of every nozzle you install.**
- 2. Keep nozzles, tubing and fittings clean during installation**
  - Wear a tool belt with pouches for fittings
  - Blow through fittings before you install them
  - Plug tubing end while working in dirt
  - Flush lines before pressure up and inspection
- 3. “Push in, then pull out to leave no doubt” when installing fittings**
  - Use tube or cable cutter, to make a clean perpendicular cut in tubing
  - Push tubing into fitting, then pull back to confirm seal
- 4. Stretch the tubing taught, but not tight**
  - Count on slight shrink
  - Use clamps every 2-3 feet to prevent sagging
- 5. Don’t kink, and if you do, cut!**
  - Use a 90 degree elbow to make a turn in a tubing run
  - Tubing has memory. If you accidentally kink it, cut out the kink.



## 8.0 iMistAway Schematic

