

Engineers Guide to Designing Smaller Flow Chambered UV  
Systems

# Chambered Wastewater UV Systems

Up to 120,000 gallons per day (83 gpm)

30" lamps (considered small flow)

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# Why and Thoughts

1. Vessel should always remain flooded. If empty and the lamps are “on” in the air, they will overheat and cause damage and quartz sleeve fouling. Piping should be configured to keep system flooded or use the bottom for inlet in the vertical.
2. Can the system be on with no flow? Yes. As long as it is flooded. If left on for a long time and water heats up, system will be fine. The UV output – as read by sensor – may alarm because as lamps heat up, the UV light falls off. Once water moves, lamps will cool down and perform as intended.
3. Can the system be turned On/Off? Yes, but not rapidly cycled on and off. Lamps can be started multiple times during the day for decanting and require 1 minute to warm up. UV system will be provided with a Hand Off Auto switch. This is very common as plants have intermittent flows.
4. Why Power Center located within 12 feet? UV lamps may not be driven properly by ballasts. The cable to and from are all pre-wired and conduited. Electronics are better off the unit and up and away from any flooding.

# Vertical UV (SUN-MV)

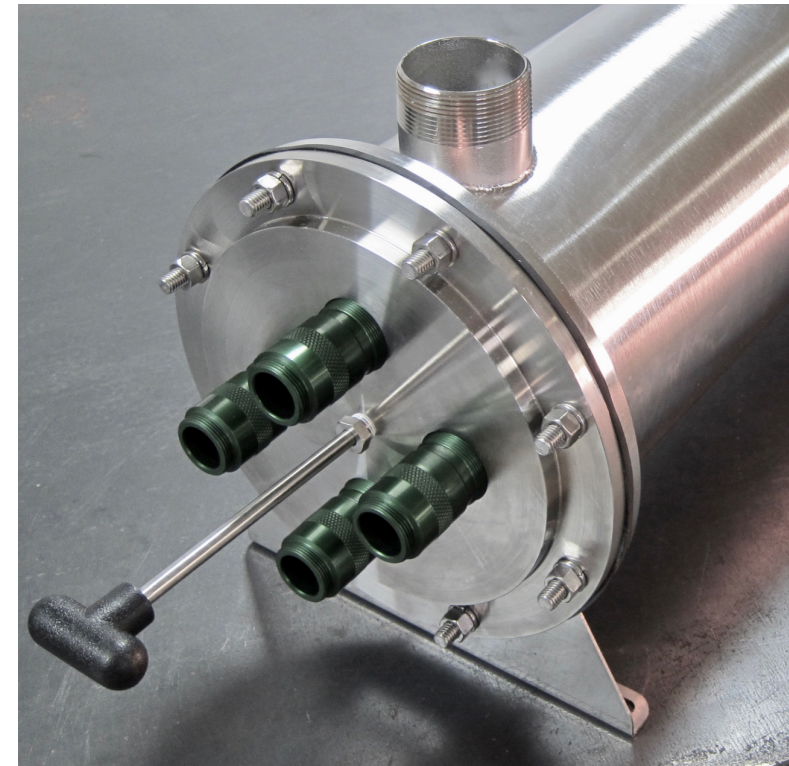
- 4 to 6 30" lamps – up to 120,000 gpd (typical wastewater)
  - Vertically Installed
  - <12-foot cable to electrical controls
  - Systems have “opposing” inlet and outlets and water goes from bottom up (to keep lamps submerged).
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- UV Lamps go in top – need room above
  - Manual quartz wiping system on top
  - Sensor looks at a lamp in the side
  - System has drain port
  - **Options:** connection type, size, location and flow pattern of inlet/outlet.



Vertical with Opposing Inlet and  
outlet with 4" RF flange  
Floor mounted

# Horizontal UV

- 4 to 6 30" lamps – up to 120,000 gpd (typical wastewater)
  - Horizontally Installed
  - <12-foot cable to electrical controls
  - Systems ***typically*** have inlet and outlet on the same side "U". Unit is piped in a way to keep the lamps submerged.
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- UV Lamps go in horizontally – need room to remove
  - Manual quartz wiping system
  - Sensor looks at a lamp in the side
  - System has drain port
  - **Options:** connection type, size, location and flow pattern of inlet/outlet



Inlet and outlet shown with 1.5" and 2" NPT  
Legs on Chamber

# Physical Design Considerations (dims)

Installation Location and Thoughts (review following photos)

1. Horizontal or Vertical Chamber
2. Connection type, size and desired location (2" to 4" typical)
3. Space to put 30" lamps in and out (40")
4. Location of Power and System Controls (accessible - away from water)
5. Distance between Chamber and Power System Controls (<12' typical)
6. Junction box to be mounted at the chamber or placed near the chamber

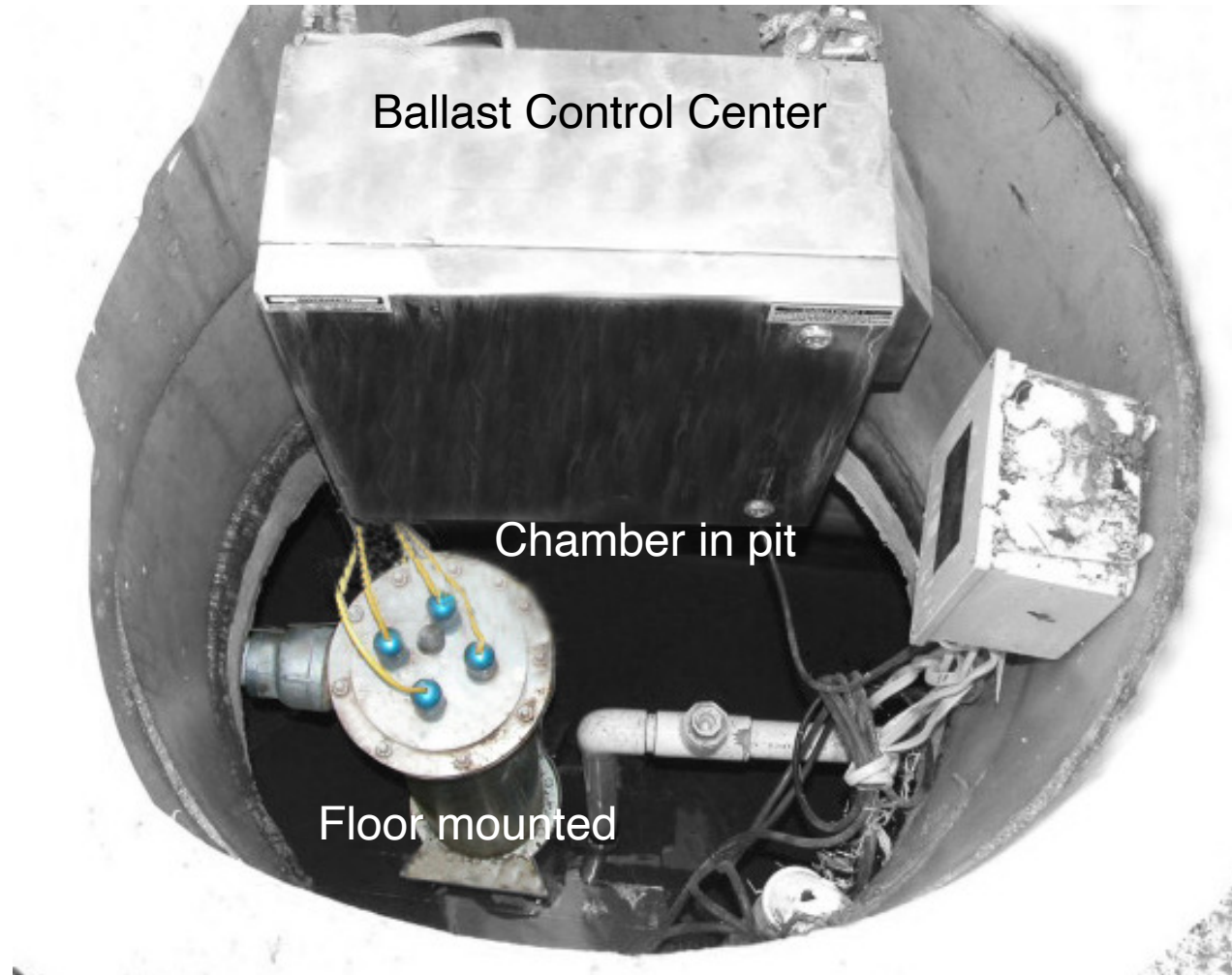
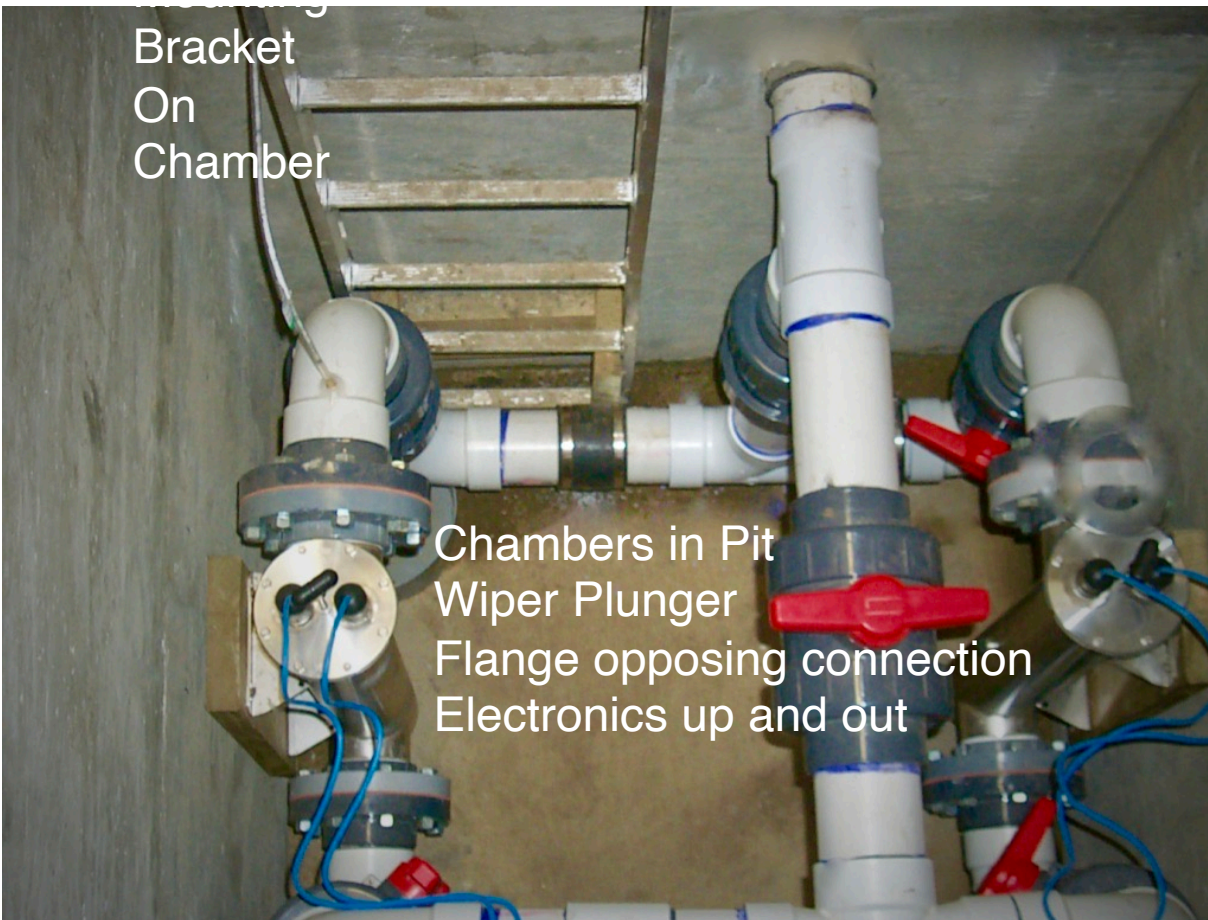
# Chamber Components (terms)

Installation Location and Thoughts (review following photos)

1. UV Chamber (pressure vessel) holding quartz sleeves and UV lamps
2. Built in Manual Quartz Wiping mechanism
3. Cable connecting the Power Control Center to the Chamber
4. Cable from Power Control Center attaches to the Junction Box, which holds lamp harness connectors. J Box is mounted to chamber or attached to a wall



# Vertical Chambers (explanations)





Junction Box

Junction Box

Junction boxes attach to the Power and System Controls  
Located <12 feet out of the pit.

Wiper Arm

Wiper Arm

Flanged Outlet

Flanged Outlet

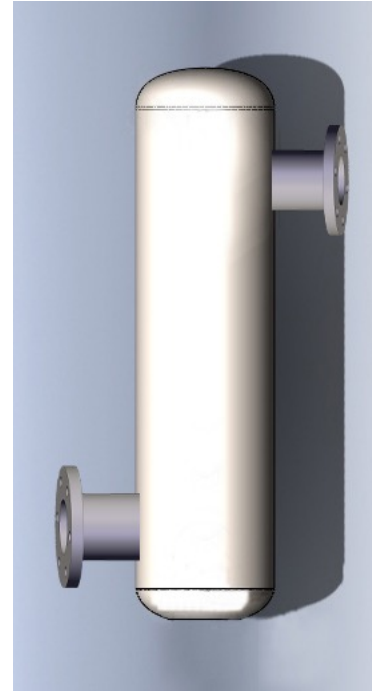
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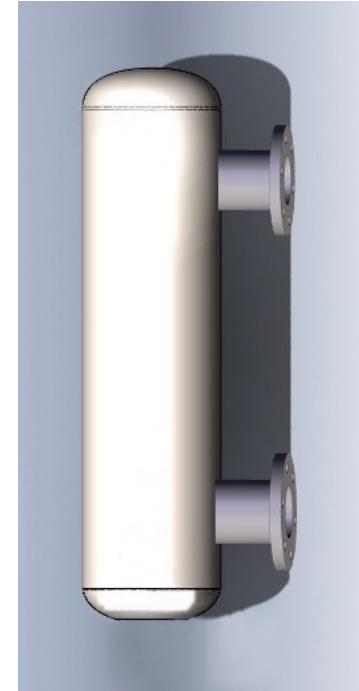


# Vertical Chamber

1. Opposing, Same Side or Custom
2. Type of connector (flange, NPT)
3. Size of connector (inches)
4. System mounts on floor
5. J-box on chamber or wall
6. Power Control System location
7. Manual wiper and UV monitoring



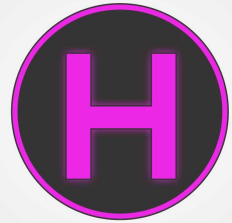
Opposing



Same Side



Side & Top



# Horizontal Chamber

1. Same Side. Opposing or Custom
2. Type of connector (flange, NPT)
3. Size of connector (inches)
4. System has mounting legs
5. J-box can be on chamber or wall
6. Power Control System location remote 12'
7. Manual wiper and UV monitoring

