

Installation Instructions and Owner's Manual

The Duke Series

Indoor Aerator



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Pre-installation Instructions

Description of the aeration system

The DUKE aeration system includes a single aeration tank with 6 spray nozzles. Incoming water flows into the solenoid valve and is directed into the aeration tank. Aeration of the water in the atmospheric tank releases the dissolved gasses from the water which are then blown out via the top mounted fan. The gas free water then flows down to the bottom of the tank where it repressurized by the submersible pump. This entire process allows for the removal of dissolved gasses without the use of chemical injection.

Water Quality Issues Addressed

The DUKE filter will perform under a variety of water qualities and remove a wide range of dissolved gases. However, there are a few things that need to be considered to ensure satisfactory performance. The water should be tested to determine the concentration both before and after treatment.

Hydrogen Sulfide - A naturally occurring gas. Hydrogen sulfide, more commonly referred to as sulfur gas, causes a distinct odor, similar to “rotten eggs.” Aeration is commonly recognized as the best way to remove this gas. Because it is a gas, hydrogen sulfide must be tested at the well site within 1 minute of drawing the sample. If a water sample has been sitting for a while the sulfur gas will dissipate and cause the hydrogen sulfide test to be lower than the actual concentration.

Radon – Chemical symbol Rn, is a slightly radioactive gas that is naturally occurring in ground water. Found in many basements this is odorless and colorless. If tested and found in any concentration, then aeration is can safely remove it from the water supply.

Volatile Organic Compounds – Or VOC's, are manmade bi-products of a variety of manufacturing and sanitation processes that have penetrated the water table. These are typically in the form of industrial solvents, petroleum fuels or products of the chlorination process in water treatment.

Carbon Dioxide – Naturally occurring low lying gas that creates bubbles and makes water look “milky”. When dissolved in water it becomes carbonic acid. This acid will cause corrosion of pipes and anode rods in water heaters.

Iron – While not a gas the Duke aerator can help to reduce iron. A naturally occurring metallic element, Iron concentrations in excess of 0.3 milligrams/liter (mg/l) combine with oxygen causing orange or red (rust) stains on plumbing fixtures. Iron naturally exists in some water sources in either clear water (ferrous) state, red water (ferric) state or bacterial form. The DUKE aeration system will oxidize dissolved iron and when paired with a backwashing sediment filter, it can reduce many ferrous and ferric forms of iron. (Note: if no backwashing filter is installed after the Duke aerator then no iron will be removed.)

*****Warning*** This system should not be used to remove flammable gases! Franklin Water Treatment does not recommend installing this system to remove flammable gases, such as methane, and cannot be held liable any personal injury or loss of property resulting from the misapplication of this product.**

Pre-installation Instructions (cont.)

Water Supply

This aeration system will function properly when the water supply is furnished by a jet pump, submersible pump, variable speed (constant pressure) pump or community water supply. As with all other filter systems, however, it is imperative that the well pump provides enough flow rate for the system to adequately function. The minimum operating flow rate is 6 gpm. To ensure sufficient flow rate for the spray nozzles, the following pumping rate test should be performed prior to installing the DUKE.

1. Make certain no water is being drawn in the house.
2. Open spigot nearest pressure tank.
3. When well pump starts, close spigot and measure time (in seconds) to refill pressure tank (well pump turns back off). This is **Cycle Time**.
4. Using a container of known volume, draw water from pressure tank and measure how many gallons until the pump turns back on again. This is **Draw Down**.
5. Calculate pumping rate by dividing draw down by cycle time and multiplying by 60.

$$\frac{\text{Draw Down (gallons)}}{\text{Cycle Time (seconds)}} \times 60 = \text{Pumping Rate (gallons per minute)}$$

Example: Draw down is 8 gallons
Cycle time is 65 seconds

$$\frac{8 \text{ gallons}}{65 \text{ seconds}} \times 60 = 7.4 \text{ gpm (gallons per minute)}$$

Location Considerations

The proper location to install the DUKE will ensure optimum performance and satisfactory water quality. The following factors should be considered in selecting the location of this system.

1. The DUKE must be installed after the well pressure tank or constant pressure pump (private well system only).
2. A pressure storage tank must also be installed after the duke to ensure the best supply of water and to prevent water hammering from pump startup. (see figure 1) **Not provided with the system.**
3. The system should be installed as close as possible (preferably within 15') to an adequate floor or laundry drain capable of handling the periodic draining of the tank. An air gap should be provided between the DUKE drain line and plumbing drain.
4. All water conditioning equipment should be installed at least 10' prior to the water heater. Water temperatures exceeding 100°F can damage the internal components. An expansion tank must be installed in the line to the water heater to allow for thermal expansion and comply with local plumbing codes.
5. Water pressure must not exceed the range of 30 - 100 psi.
6. The system must not be subject to freezing temperatures.
7. The pump, fan and solenoid valve require 115/120 V, 60 Hz electricity from an outlet that is not wired to a switch.
8. A cartridge or in-line filter (if desired) may be installed before the DUKE system. This will prevent sediment from blocking the spray nozzles.

General Installation

GENERAL INSTALLATION & SERVICE WARNINGS

The Duke aerator is not designed to support the weight of plumbing. Make sure all plumbing connections and vent piping are properly supported by pipe hangers.

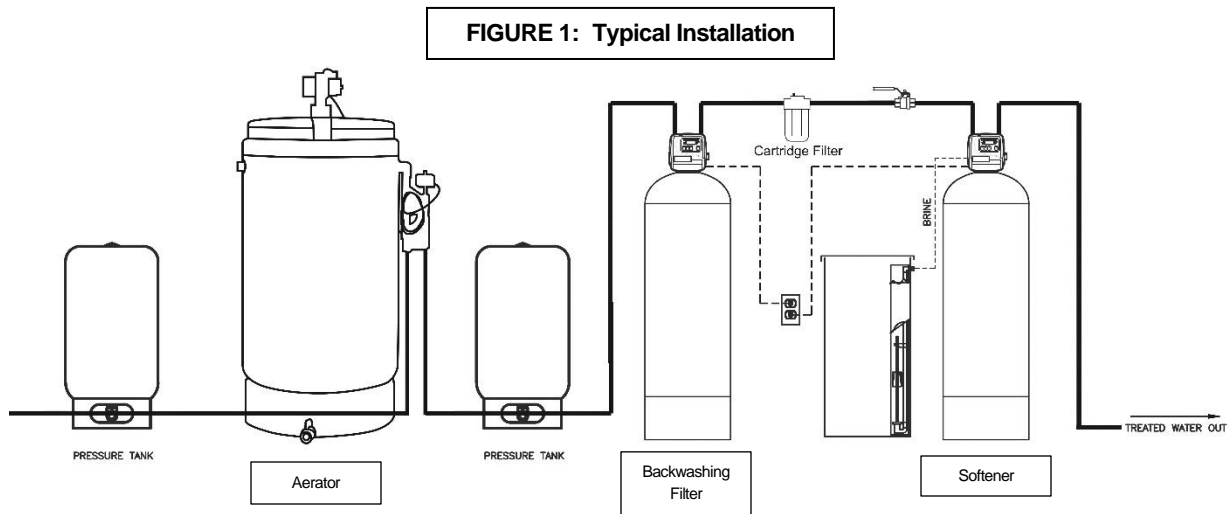
Do not use Vaseline, oils, other hydrocarbon lubricants or spray silicone anywhere. A silicone lubricant may be used on black "O" Rings. *Avoid any type of lubricants, including silicone, on red or clear lip seals.*

Do not use pipe dope or other sealants on threads. Teflon® tape may be used as required. Teflon® tape is not used on any connection where "O" Ring seals are used

NOTE: If the plumbing system is used as the ground leg of the electric supply, continuity should be maintained by installing ground straps around any non-conductive plastic piping used in the installation.

An expansion tank must be used on the water heater supply line to allow for thermal expansion.

All local plumbing codes must be followed.



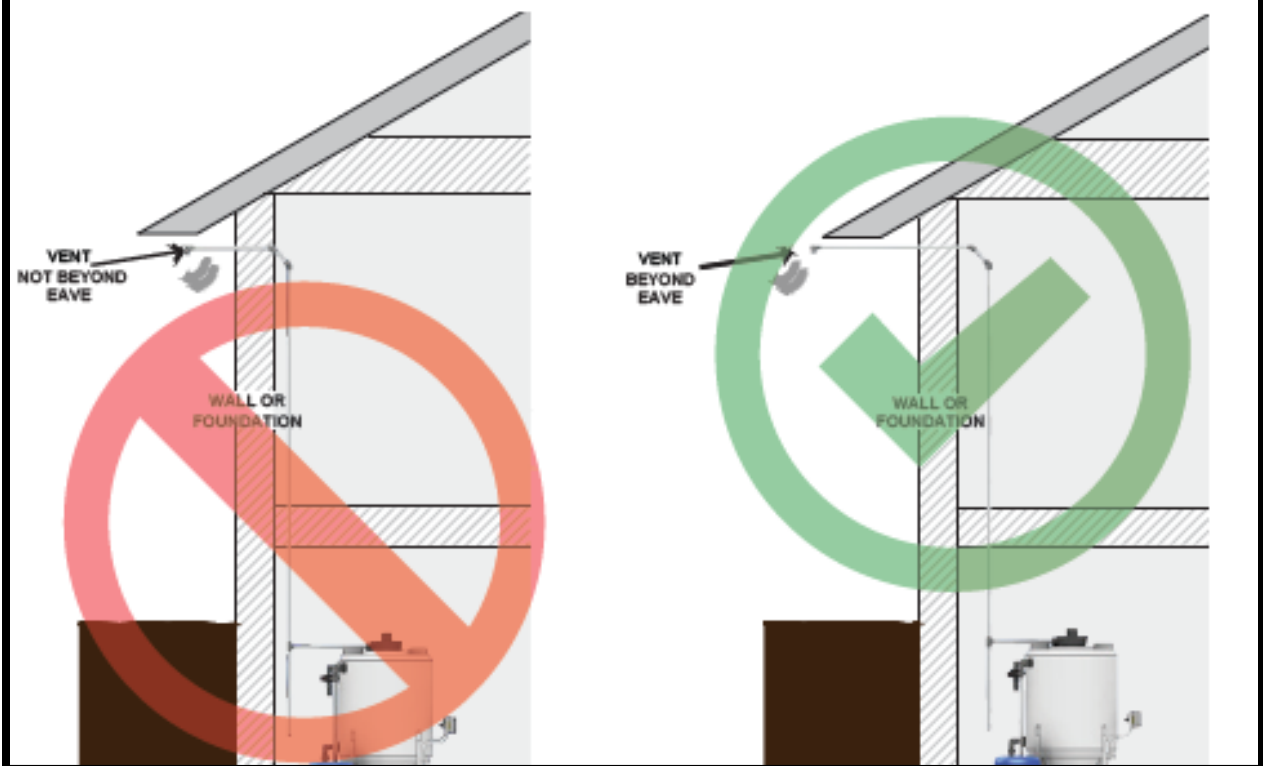
Installation Instructions

- STEP 1:** **Unpack aeration unit**, making sure to remove entire contents of the shipping container prior to disposal. Check all parts for damage prior to their installation.
- STEP 2:** **Select a suitable location**, make sure that the area chosen is level and is swept clean of debris prior to placing the unit. The location must also be able to support a minimum of 920 lbs. There should also be sufficient room for the placement of the post pressure tank with no more than 4 feet of pipe between them. A longer run of pipe between the aerator and the post pressure tank may cause air-hammer and pump damage.
- ***Warning*****This unit cannot be installed outdoors or exposed to the elements.**
- STEP 3:** **Shut off all water at main supply.** On private well system, turn off power to pump and drain pressure tank. Make certain pressure is relieved from complete system by opening nearest faucet to drain system. SHUT OFF FUEL / ELECTRICAL SUPPLY TO WATER HEATER.
- STEP 4:** **Plumb the water supply line** to the unit's inlet solenoid valve. This is located on the right-hand side as you face the label side of the unit and to the immediate right of the outlet pipe.
- STEP 5:** **Plumb the outlet line:** This is located on the right-hand side as you face the label side of the unit. It is directly to the left of the inlet pipe and has a pressure gauge and 40-60 well switch.
- STEP 6:** **Plumb the overflow:** the overflow line is to the left-hand side of the unit facing the label and should be run over to a suitable drain. In the unlikely event of a solenoid valve failure this will allow water to go to drain without spilling out onto the floor.
- STEP 7:** **Install a drain line.** The unit has a drain port at its base. It can either be hard plumbed into a floor drain or a hose bib can be installed to allow for the draining and cleaning of the system.
- STEP 8:** **Connect the exhaust system.** The indoor aerator comes with an exhaust blower which should be connected to a 3" pipe. It is highly recommended to install a union at the blower to allow removing the lid to conduct maintenance. Vent piping needs to be run to the exterior of the building and should be as short as possible and all joints completely sealed. Ensure adequate bracing of the vent pipe to prevent any damage to the tank lid. The vent pipe should end in a 90 degree elbow that is turned downwards to prevent any rain or snow from entering pipe. Make sure that when running vent pipe that it clears the homes eaves and is not venting into the attic. (See figure 2).

Installation Instructions (cont.)

WARNING!

VENT PIPE INSTALLATION MUST COMPLY WITH LOCAL BUILDING CODES. FAILURE TO COMPLY WITH CODES COULD CAUSE ACCUMULATION OF DANGEROUS GASSES INSIDE THE BUILDING, RESULTING IN ASPHYXIATION, EXPLOSION OR FIRE AND SERIOUS PERSONAL INJURY OR DEATH.



STEP 9: **Connect electrical.** Wire the aerator re-pressurization pump to the pressure switch, then the pressure switch wired to the outlet. Plug this into the back of the piggyback plug of the down float switch. The up-float switch should be connected to the solenoid valve, then connected to the outlet.

STEP 10: **Check connections and begin filling unit.** Turn on the main water supply and allow the unit to start filling. Check all connections for potential leaks. After one minute of initial operation, unplug the solenoid to check that it is working properly by shutting off the water. If spray nozzles do not shut off check the electrical connections and condition of solenoid. Otherwise, resume filling unit and start normal operation.

STEP 18: **TURN ON FUEL / ELECTRICAL SUPPLY TO WATER HEATER.**

Maintenance

After installation periodic maintenance should be conducted to ensure the continued operation and effectiveness of the duke aerator. It is recommended that the tank be inspected once every 3 months to determine if cleaning is necessary. Its strongly recommended that the tank be fully cleaned at least once a year.

Instructions for Cleaning:

- 1) Unplug unit and turn off power to the unit.
 - a. Note: if the inlet Solenoid valve is fully functional the secondary storage tank will continue to supply water to the home for a time.
- 2) Disconnect vent piping and remove lid from tank.
- 3) Pour one gallon of Chlorine Bleach into a full tank.
- 4) Using a long handle brush, begin scrubbing the sides and bottom of the tank to loosen any deposit build up. Make sure to also clean the lid and spray bar with disinfection wipes. Ensure that any debris or buildup on spray nozzles is cleaned off.
- 5) Once scrubbing is complete open the bottom drain and empty the tank of water, bleach and deposits.
- 6) Plug in the inlet solenoid valve in and allow for water to begin spraying into the unit. While water is spraying into the unit continue to brush down the side of the tank to push any remaining deposits down to the open drain.
- 7) Once unit has been rinsed and all the bleach has been washed out, reverse above procedure and return unit to operation.

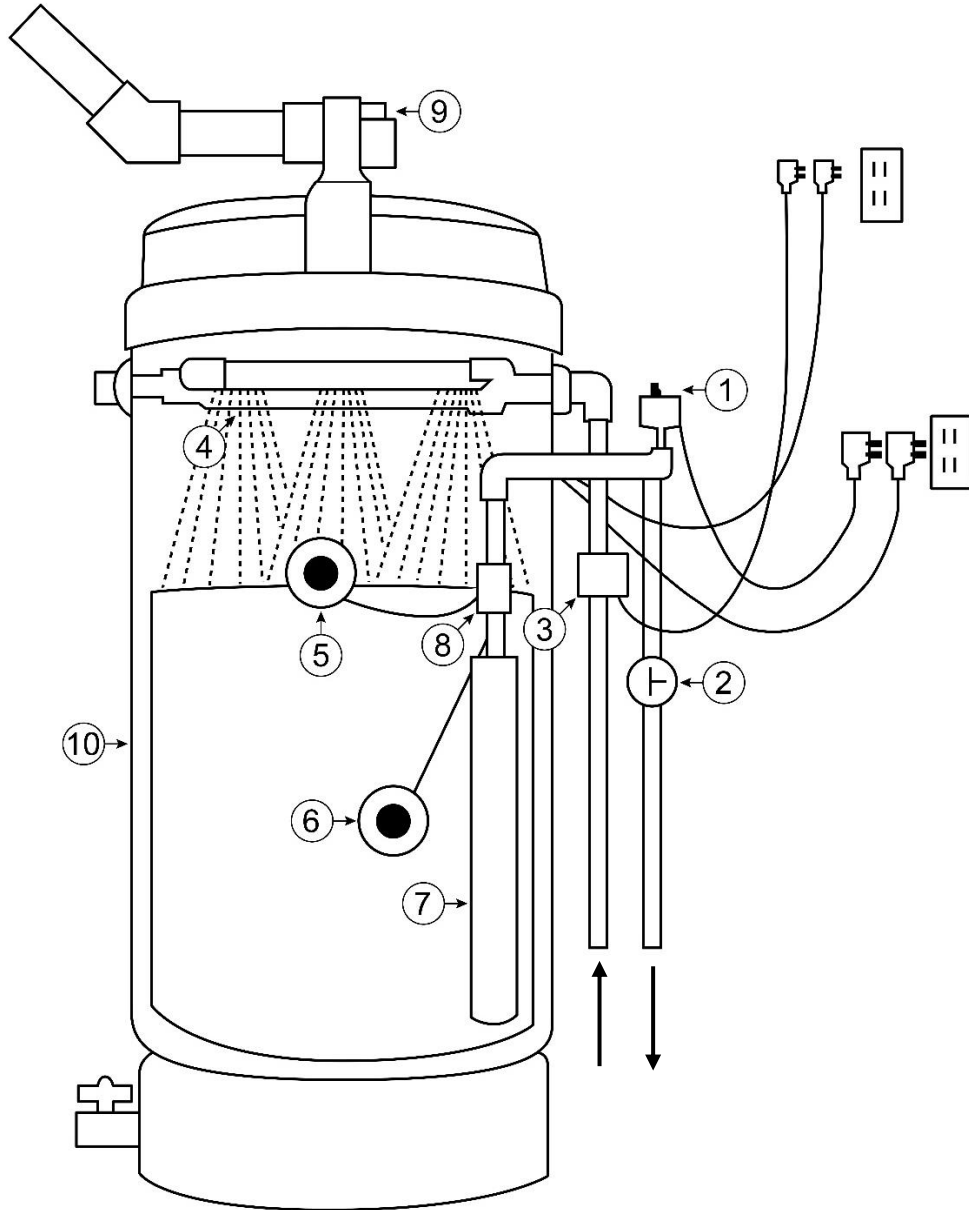
Troubleshooting

PROBLEM	CAUSES	SOLUTIONS
Continuous flow from overflow fitting	A) Solenoid valve not shutting	<ol style="list-style-type: none"> 1) Ensure that solenoid valve is connected to up-float switch. 2) Replace solenoid valve 3) Replace up-float switch
Continues flow to drain	A) Bad or open ball valve	<ol style="list-style-type: none"> 1) Replace or fully close ball valve
Water hammer from pump	<ol style="list-style-type: none"> A) No secondary pressure tank B) Faulty pressure tank C) Too long of pipe run to pressure tank 	<ol style="list-style-type: none"> 1) Install second pressure tank after aerator 2) Replace pressure tank 3) Move pressure tank to within 4' of aerator.
Re-pressurization pump won't turn on.	<ol style="list-style-type: none"> A) Lack of power B) Inadequate water supply C) Defective float or pump 	<ol style="list-style-type: none"> 1) Ensure electrical outlet is supplying power to unit 2) Check wiring in pressure switch or replace pressure switch 3) Guarantee that solenoid valve is opening and well pump has adequate pumping rate to feed unit operation. 4) Check to make sure nozzles are free of debris. 5) Replace float or Pump
Re-pressurization pump won't shut-off	A) Pump is not wired correctly to well switch	<ol style="list-style-type: none"> 1) Ensure that down float is wired in front of pump 2) Check to see if nozzles are clear 3) Check solenoid for operation 4) Check well pump for adequate pumping rate.
Vent fan not turning on	<ol style="list-style-type: none"> A) Fan not powered B) Defective fan 	<ol style="list-style-type: none"> 1) Ensure outlet is supplying power to unit 2) Check Up float for operation 3) Replace Fan
Insufficient gas removal	<ol style="list-style-type: none"> A) Underpowered spray nozzles B) Insufficient venting 	<ol style="list-style-type: none"> 1) Ensure that spray nozzles are clear of debris and flowing freely 2) Check that incoming pressure is at least 30 psi 3) Ensure that well pumping rate is at least 6 gpm 4) Remove 1-2 spray nozzles to increase pressure/spray pattern on remaining nozzles. 5) Check that the vent fan is working and vent piping is not blocked.
Rust Color Water Post unit	A) Lack of backwashing system	<ol style="list-style-type: none"> 1) Install backwashing filter post aerator 2) Inspect backwashing filter to ensure operation

SPECIFICATIONS

Description	AERO1IRM-L-PT
Voltage	110 v
Amps	11 amp
Pump HP	0.5
Submersible Pump Output GPM	20
Maximum Inlet Flow Rate GPM	40
Exhaust Pipe Size, in.	3
Bottom Drainpipe Size, in.	1.25
Inlet/Outlet Pipe Size, in.	1
Tank Diameter x Height, in.	40 x 70
Max Storage, gallons	130
Approximate Ship Wt., lbs.	110
Total Weight Full	920

Component Parts Breakdown



REF#	Part #	Description
	AER01IRM-L-PT	Complete Duke indoor aerator system
1	9013FSG2-40/60	40/60 PRESSURE SWITCH
2	IPPG1002-4L	PRESSURE GAUGE 0-100 PLASTIC
3	210-100	SOLENOID VALVE 1" THD 115
4	NOL004	1/2" SPIN NOZZEL AERATION 4.2
5	10JSU120V	FLOAT 120 VOLT UP 10' W/PLUG
6	10JSD120V	FLOAT 120 VOLT DOWN 10' W/PLUG
7	20XC1-05P4-2W115	20 GPM BOTTOM DRAW 115V SUB
8	LC125	CHECK VALVE 1 1/4" PLASTIC
9	PP/BLR001A	PREPPED 115V BLOWER
10	PP/AER01N	AERATOR SHELL FOR INDOOR UNITS

TEN YEAR LIMITED WARRANTY

WARRANTY – Franklin Water Treatment, LLC warrants this aerator against any defects that are due to faulty material or workmanship during the warranty period. This warranty does not include damage to the product resulting from accident, neglect, misuse, misapplication, alteration, installation, or operation contrary to printed instructions, or damage caused by freezing, fire, flood, or Acts of God. From the original date of consumer purchase, we will repair or replace, at our discretion, any part found to be defective within the warranty period described below. Purchaser is responsible for any shipping cost to our facility and any local labor charges.

- One year on the entire aerator
- Ten years on the retention aerator tank

GENERAL CONDITIONS – Should a defect or malfunction occur, contact the dealer that you purchased the product from. If you are unable to contact the dealer, contact Franklin Water Treatment, LLC @ (260)693-1972. We will require a full description of the problem, model number, date of purchase, and selling dealer’s business name and address.

We assume no warranty liability in connection with this aerator other than specified herein. This warranty is in lieu of all other warranties, expressed or implied, including warranties of fitness for a particular purpose. We do not authorize any person or representative to assume for us any other obligations on the sale of this water conditioner.

FILL IN AND KEEP FOR YOUR RECORDS

Original Purchaser	Date of Purchase	Model #	
Address of Original Installation		City	State
Dealer Purchased From	Dealer Address	City	State

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