Turbo Rain Model 330
Owners Reference Manual
2018 version 1

Statement of Purpose: Turbo Rain Model 330 is an environmentally friendly sustainable solution for irrigation by pumping collected rainwater to drip systems and lawn sprayers with the sun providing for the replenishment of battery power. Reliable sustainable irrigation is now possible anywhere, even in remote areas.

General Specifications: 12-volt DC system. Contains 18-amp rechargeable sealed lead acid battery with safety fuse protection and 3.3 GPM pump built within a lockable, weather resistant carrying case. A mechanical timer model (T) and an automatic timer model (A) are offered. A 20-watt solar panel is included with this sustainable irrigation solution to re-charge the battery anywhere there is sun.

Safety Issues: Owners should always install the Turbo Rain case on a solid, level surface. Battery should always be secured with safety strap. Never use a fuse greater than the rated amperage, which is 10-amps for this system. Limit continuous running of the pump to 45 minutes, then off for 15 minutes to allow motor to cool down. Children should not play with the system. All persons operating Turbo Rain model 330 should be properly trained. This system is for pumping water only, not intended for any other type of liquid including gasoline or other flammable liquids. This "Owners Reference Manual" should remain inside the case for any future reference.

List of Parts Included with Turbo Rain System

This details the components in the kit supplied with the purchase of Turbo Rain to make it easy to set up the Turbo Rain system and get you up and running.

1. 3.3 gallon pump (installed)
2. 10-amp charge controller (installed)
3. 20-watt solar panel with wire and connection (ready to go, found in 2nd box)
4. Either Mechanical Timer or Auto Timer (installed)
5. Quantity 1: filter with female direct loc attached.
6. Quantity 1: 24 inch clear tube with female garden hose connection attached.
7. Quantity 1: 6 inch clear tube with female garden hose & adjustable valve attached.
8. Quantity 3: 24 inch black tubing.
9. Quantity 2: straight black tubing connectors.
10. Quantity 1: T fitting for black tubing
11. Quantity 1: female direct loc fitting for water out to irrigation.
12. Quantity 2: extra 10-amp fuses.
13. Quantity 1: roll of Teflon tape.
14. Quantity 1: Gray connector lever for easy removal of wires.
15. Quantity 1: Water output vacuum breaker.
16. Quantity 1: 18-amp hour sealed battery with nut / bolt connectors.

(Picture 14 for non-installed parts)

You have a choice to mount on top of the water tank, or to place the Turbo Rain system on ground level.

Install on top of water tank:

Step 1: Determine location of Turbo Rain and the filter. Filter should be easy to reach to clean the internal screen.

Step 2: At the location of the filter, drill out a ¾" hole. The black tubing sections supplied will allow for water "vertical pull" of 6 feet maximum.

Step 3: It is recommended that the T fitting be secured to the bottom of the tubing. You may need to enter in from the large gutter connection" hole to do this. Next, assemble the necessary number of black tubing sections and push down through the ¾" hole.

Step 4: With the T fitting sitting on the bottom of that water tank and the excess tubing on the top outside of the tank, lift upwards an inch and make a mark on the tubing level with the top of the tank. Next, add an inch upwards from your mark made on the tubing, and cut the tubing. Insert the top of the tubing into the direct loc fitting on the bottom of the filter. Rotate the direct loc "nut" so that the tubing is locked in tight. If done properly, the bottom of the nut will rest on the surface of the water tank.

Step 5: With the Turbo Rain and filter assembly mounted on the top of the water tank, next step is to connect the female garden hose connection on the 6" clear tubing to the male garden hose connection on the water input side of Turbo Rain. The water adjustment valve is pre-installed.

Step 6: Using the 24" clear tubing, connect the female garden hose fitting to the male garden hose fitting built in to the top of the filter assembly. Using the 6 inch clear tubing with valve attached, connect female garden hose connection to the male garden hose connection on the Turbo Rain case marked "WATER INPUT". Finally, attach barbed fitting on adjustable valve into clear tubing coming from the filter assembly.

Step 7: Install vacuum breaker on "Water Output" garden hose fitting, then install female direct loc fitting for tubing that will flow out to drip system. The vacuum breaker will stop the continuous siphoning of water from the tank to the irrigation. (Picture 15,17 & 20)

Install on level ground:

Step 1: Position Turbo Rain on level ground.

Step 2: Install clear 6" section with female garden hose connection to the Turbo Rain male garden hose connection on the Turbo Rain case marked "WATER INPUT".

Step 3: Next, insert the 24" clear tubing end into the barbed water adjustment valve.

Step 4: Secure the female garden hose connection on the clear 24" tubing to the male hose connection built into the filter. The direct loc fitting that is installed on the filter at time of manufacturing, will now face the water source.

Step 5: Either use the 3 sections of black tubing or your own water tubing to pull water from the water source to the filter.

Step 6: When the Turbo Rain pump shuts off, water will continue to freely flow from the tank to the irrigation. It is recommend that you install a battery operated zone controller in the irrigation line (available local hardware store) or install an in line check valve (available from Turbo Rain Dealer) to stop the water from siphoning out of the tank.

Step 7: On the Turbo Rain case you will note a male garden hose connection identified as "WATER OUTPUT". Connect the female direct loc fitting on the garden hose connection, then connect to the outgoing water lines. (Picture 16,18,19)

Installing the battery: Start by positioning the Turbo Rain case in front of you, with the latch side to the left and water output side towards you. Release the latch, and flip open the top of the case. The pump will be on the left side. Release the safety strap, and insert the battery within the 3 locator bolts and the case wall. The battery should be positioned so that the black terminal is to your left and red battery terminal is positioned to your right. To secure, insert the tapered end of the velcro strap into the cut out section of the velcro strap. Pull both sides until tight, and press down on the strap until it is secure. (Picture 2)

Electrical Connection to Battery: The 18-amp hour battery includes a nut and bolt system to secure the wire terminals. The black wire should be fastened to the left side battery terminal block by tightening the nut on the bolt. Then the red wire should be fastened to the red terminal block. Tighten both connections securely. With the connection complete, the charge controller will come to life. (Picture 2)

Connect the Solar Panel: The 20-watt solar panel can now be attached to the Turbo Rain system. Unpack the solar panel, and there will be 10 feet of wire attached to the solar panel with a gray connector. This gray connector will mate with the gray connector on the Turbo Rain case marked "SOLAR PANEL ONLY". Just push the 2 gray connectors together. Maximum solar panel wattage is 120 watts. (Picture 3)

Position the Solar Panel: Position the solar panel so that it receives direct sun light, and is not obstructed in any way. Having a partial obstruction in front of the solar panel will significantly reduce the solar power that is returned to the battery. Point the solar panel facing south for best results.

Checking the Fuse: The fuse holder is located within the "red" or positive wire circuit that starts at the battery. The white 2-piece fuse holder should be separated by pushing the spring- loaded mechanism together, then rotating each side in opposite directions. The fuse utilized is a 3AG style fuse, rated at 10-amps. Pull out the fuse and visibly inspect the filament. If it is broken, remove and replace. If not, reconnect. Do not operate the system with a fuse rated more than 10-amps. There are 2 extra 10-amp fuses included in the kit. (Picture 1)

Water Volume Adjustment Valve: The pump installed will provide a maximum water flow of 3.3 gallons per minute. If you require less water flow, locate the adjustment valve that is attached on one side to the 6 inch clear tubing, and the other side to the 24" clear tubing. to the 6 inch clear tubing. Start with the valve in full open position and start the pump. Then slowly close the valve until you achieved the correct water volume output. Volume can be adjusted from about 1 GPM to 3.3 GPM. (Picture 4,15 & 16)

Water Flow Through Filter: When in the process of installing the water filter, you will note there is one end with a female direct loc fitting attached. This is the end of the filter that will be closest to the water source. In order for the filter to operate correctly, water must flow first through this end of the filter as it is pulled by the pump up to the water input side of Turbo Rain. (Picture 5,15 & 16)

Cleaning the Water Filter: The water filter is necessary to inhibit debris from entering the pump and drip irrigation emitters or sprayers. To maintain the pump warranty the filter must be utilized. The filter should be monitored and cleaned regularly. A dirty filter will reduce water flow from the pump, much like closing the water adjustment valve. To clean the filter, remove the cap and pull out the filter. Thoroughly clean the inside of the filter by using a bottle brush or spraying water through the screen. Then, reinstall the filter and tighten the cap. (Picture 6)

Best Performance Tips: It is highly recommended that the water input connections, tubing and filter be periodically inspected for air leaks. Teflon tape is provided where necessary. An air leak will reduce the flow of water being pulled to the pump and the volume of water flowing out to the drip or spray system. It is also recommended to periodically inspect the battery nuts and bolts for solid connection.

Activating the Pump: There are two ways to activate the pump for the Model 330 system. There is either a mechanical timer switch (model 330-T), or an automatic timer available (model 330-A).

For the 330-T, set the timer to desired time, and it will automatically shut off. (Picture 7)
For the 330-A, select from 17 automatic on/off cycles or operate manually on/off. Please read timer instruction manual for details. (Picture 8)

Function of Charge Controller: (See the enclosed operating manual for complete instructions). The charge controller can be found in the top "OPERATOR CONTROL" section of the Turbo Rain case. Here you will find the charge controller as well as the timer activation device. The charge controller performs the following functions:

1. Monitors the flow of energy from the solar panel to the battery. When battery is fully charged, energy is diverted away from the battery to prevent over-charging and potential damage.

2. Monitors the voltage of the battery and provides user feedback on the current state of battery charge.

3. Protects the battery from damage by not allowing the battery to power the pump when battery voltage is too low. Continually running the Turbo Rain system with a discharged battery will significantly reduce the life of the battery. When the battery indicator shows low state of charge, and the pump will not run, consider the following options:
    a. Install a back up battery.
    b. Use electrical trickle charger to bring voltage to normal operating level.
    c. Wait for solar panel to re-charge the battery.

4. To keep the battery charged so it will pump water when needed, consider the following:
    a. Reduce amp draw on pump by adding more drippers for increased flow, or reduce water input to better match actual water flow required.
    b. Reduce time needed to irrigate by adding additional drippers so that time to irrigate can be reduced.
    c. Reduce watering time or increase interval between watering. Do not over water.
    d. Add a 2nd 20-watt solar panel. Good technique might be to point one solar panel to pick up morning sun, then position the 2nd solar panel to prick up the afternoon sun.
    e. Purchase a low cost DC amp meter and understand exact relationship of amps consumed during irrigation to the amps returned to the battery with the solar panel (s).

(Picture 7 for 330 T) and (Picture 8 for 330 A)

Recharging the Battery: We provide the option of purchasing a 1-amp electric trickle charger. This is a 2-stage charger that will safely provide a recharge to the battery and then automatically switch to maintaining the battery. The trickle charger is designed for indoor use only. There is a 5 foot wire installed with the charger. After plugging the charger into a 110-volt power source, the gray connector supplied with the charger will mate with the gray connector installed on the Turbo Rain system and marked with "ELECTRICAL CHARGE ONLY".

Additionally, owner may change the optional wiring,which is included, so that the electric charger leads will connect directly to the battery terminals. This helps in having back up battery charged and ready if needed. (Picture 9 &10)

Options for Model 330-A: The following options are available only on the 330-A.

1. **Dual Accessory Ports:** located on the water input side of the Turbo Rain case, a single accessory port is installed. This port will accept the male connection installed on a rain / freeze sensor or a low water float switch. If you need dual accessory ports to operate both the rain sensor and low water float, this can be added as an option. (Picture 11)

2. **Rain & Freeze sensor:** This option allows the installed sensor to interrupt the automatic water cycle when enough rain has triggered this operation. The regular automatic watering cycle will resume only when the sensor has sufficiently dried out. The sensor is adjustable to shut off the watering cycles at differ moisture levels. In addition, this sensor will also protect the pump from operating in freezing temperatures when damage may occur to the pump. (Picture 12)

3. **Low Water Level Float Switch:** This option allows for a low water float switch to be attached to Turbo Rain through an accessory port (see above). While it is important to note that the installed pump can be operated without water with no damage, the pump continues to consume energy from the battery. To conserve energy in the battery, the float switch will stop the automatic watering cycle until water is supplied in sufficient volume to the holding tank. (Picture 13)

Options for Model 330 T & A: The following options are available for the Mechanical & Auto timer models.

1. **20-watt solar panel:** Includes 20-watt solar panel with 10 feet of wire and gray connector to Turbo Rain.

2. **In-line check valve:** Needed when pump is installed on level ground to stop siphoning of water out of tank.

3. **18-amp hour sealed battery:** Can help to have a back up battery ready to go.

End of season shut down procedures:

As you approach the end of irrigation season, you will need to consider the following:

1. Disconnect the water system from the water tank to Turbo Rain. Store tubing and filter in garage.
2. Activate the pump, and allow all water to pass through the pump.
3. If you leave Turbo Rain outside for the winter season, leave the solar panel attached to provide voltage back to the battery.

4. Better yet, bring the Turbo Rain system in to the garage and place battery on trickle charger.
5. Disconnect in line check valve or zone controller and store in garage.

Spring start up procedures:

1. Re-install tubing, filter and Turbo Rain per instructions.
2. Insure battery has adequate voltage to start the pump.
3. If pump has not been operated for a long period, pour water into water input side to moisten the valves and prime the pump.

WARRANTY STATEMENT

Garden Green EcoSolutions, LLC is proud to offer the Turbo Rain line of pump systems and accessories and makes every effort to assure that all products meet the highest quality and durability standards.

Garden Green EcoSolutions, LLC will warrant to the original purchaser that the Turbo Rain system and accessories are free from defects in materials and workmanship for a period of 12 months from the date of shipment to customer. Additionally, the pump utilized in the system is backed by a 4-year manufacturer warranty.

This warranty will be extended to all products sold by Garden Green EcoSolutions, LLC.

This warranty does not apply to damage caused directly or indirectly by the purchaser, misuse, abuse, negligence or accidents, repairs or alterations performed outside of our facilities, criminal activity, improper installation, normal wear and tear or to lack of maintenance. In no event will Garden Green EcoSolutions, LLC be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you.

This warranty is expressly in lieu of all other warranties, express or implied, including the warranties of merchantability and fitness.

To take advantage of this warranty, please call 331-777-5701 to speak with a representative of Garden Green EcoSolutions, LLC. To begin the process you will be asked for the serial number of your Turbo Rain system.

You may always e mail Bill@turborain.com with warranty issues or other questions.

*** Disclaimer: Pictures shown in this owners manual are for reference only, and Garden Green EcoSolutions, LLC reserves the right to use different components of better or equal performance as needed. ***