

Thor Bagger Instructions

The Thor Bagger is designed to quickly dispense mushroom substrate and water into a bag so you can spend less time fussing with making fruiting blocks and more time living life. It is designed to be a flexible base with potential for future expansions.

The unit ships in two parts. These are attached using the threaded unions on each leg. If you ordered leg extensions, first attach them to the lower section so they are snug, but not tight. You will need two people to lift the top and loosely attach each union, then once they are all hand tight, cinch all of the unions one by one with a wrench.

The base unit uses a time based dispenser or a volumetric dispenser. You'll find it attached to the bottom of the fiberglass hopper, bolted to the large 3D printed flange. The controller at the top right uses compressed air to open and close sliding gates on the dispenser to allow material to flow for a set amount of time, and uses the same timing technique to control the water valve to dispense water. You'll see that the water line attaches to the back of the dispenser cone and remains isolated from the solids all the way to the end of the cone.

The hopper is divided into two sections, with enough volume to hold a little over two full 40lb bags of sawdust and soy hull pellets or other pelletized or granular substrates.

The water system is attached to the rear right leg, behind the control box. It has an inlet for a standard water hose, which feeds into a pressure regulator, which is the brass fixture with the gauge on it. Standard water pressure is about 70psi in most areas, so the regulator is pre-set at 50-55psi to avoid fluctuation in the amount of water that's dispensed due to pressure drop from other sources drawing on the water supply. It is not recommended to reduce the pressure further unless you have water low pressure at the source. This is because a large difference between the water pressure on the line and the pressure set at the regulator can result in "creep," where the water pressure slowly raises in Thor's water tank after the water is dispensed. This will cause the amount of water to be heavy if the bagger rests for a while between bags.



The control box is located at the top right on the front of the bagger. It has three timer interfaces that are discussed in greater detail in the calibration section below. The top two timers correspond with the left and right hoppers, and the lower controls the water. The included air line with splitter plugs into the two air inlets as shown in the picture on the previous page. The foot pedal plugs into the matching plug on the bottom, as does the power supply.

Most people find it helpful to place a tote or bucket with a grate or wire shelf over top to catch drippings and to allow the bottom of the bags to rest on the grate during production. The water comes out with a good bit of force by design, to mix up the pellets and speed the dosing process, so having a base to rest the bags on helps.

Calibration

Needed - Scale and a bucket or two. Notepad and pen.

Bagger should be plugged in and have air supplied at 50PSI or so. The pressure regulator on the water inlet is set about 50-55psi. This should not be adjusted unless the local pressure is low and you're seeing fluctuations on water weight.

The Control Panel has three displays arranged upper left, top right, and one below. In the same order, they control the left hopper, right hopper, and water dispensing.

Each display looks like the one depicted at the right. The top numbers are the amount of time that the timer is active, during which the little "OUT" text will be visible on the left. You'll rarely see it unless your decimal has moved and the time is running longer than it should.

To change the Program and time, hold the "Set" button until the "P0" starts flashing. Pressing up or down will change the program. Tap "Set" again so that the numbers at the top are flashing. Now press the up and down arrows until you reach the desired time. Pressing the Pause/Trigger button now will change the decimal location. To exit, hold "Set" again until the display stops flashing.

Note that the decimal should be in the middle position, and ONLY in the middle. If a material is dispensing in an unexpected way, check the decimal. Its position is changed the same as the time, but press the lower right button instead of the arrows and it will cycle through positions. This is the number one issue people run into with the timers.

Timed Dispenser Adjustments:

The timed dispenser is the most basic style, where the amount of material dispensed is controlled directly by the amount of time the shutter is open. Naturally, the higher the number, the more material will be dispensed, but you're setting the length of time that material will be dispensed, not the target weight.



To test the weight, hold a bucket under the cone and press the Trigger button on the timer you are calibrating (rather than pressing the foot switch). Only that material will dispense into the bucket and you'll need to weigh it and repeat a few times to get an average. (If the pellets have been sitting for a while, then ignore the first reading) Adjust the time up or down until the average weight is correct.

Follow this for all three timers. It is helpful to tare a bag with the bucket on your scale when you're setting the water, so that you can use it to keep the water from splashing out of the bucket.

Weight Matrix For Timed Dispensing

100% Oak		100% Soy		Water		
Time (Sec.)	Weight (LB)	Time (Sec.)	Weight (LB)	Time (Sec.)	Weight (LB)	
0.80	2.45	0.60	2.65	2.75	7.07	
0.75	2.29	0.55	2.35	2.50	6.8	
0.70	2.12	0.50	2.00	2.25	6.34	
0.65	1.96	0.45	1.70	2.00	5.8	
0.60	1.79	0.40	1.40	1.75	5.15	
0.55	1.63	0.35	1.12	1.50	4.45	
0.50	1.46	0.30	0.85	1.25	3.76	
0.45	1.30	0.25	0.55	1.00	3.04	
0.40	1.13	0.20	0.38	0.75	2.35	
0.35	0.97	0.15	0.25	0.50	1.65	
0.30	0.80			0.25	0.81	
0.25	0.64					
0.20	0.47					
0.15	0.31					

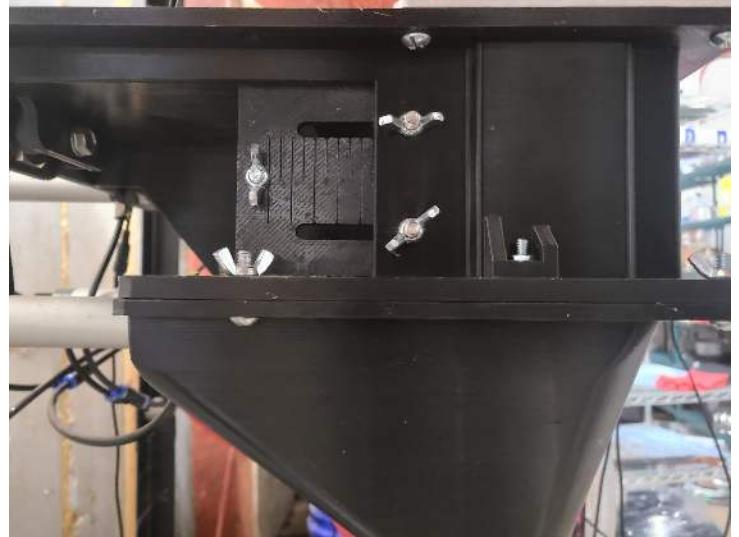
*all values are approximate and will vary based on the type of substrate, local water flow, etc. This should be used as a starting point during calibration, but must be dialed in from there.

Volumetric Weight Table for Standard Sized Dispenser

	Oak	Soy	Fast Fruiting	Rye	Milo	Millet
Max	2.1	2.1	1.8	2.5	2.7	2.65
Min	0.5	0.5	0.5	0.6	0.7	0.75

Volumetric Dispenser Adjustments:

If you are using the Volumetric Dispenser (pictured to the right) then the time on the controller doesn't directly control the amount of material being dispensed. The timer should be put to 0.6 seconds for both OP (Time OPen), and CL (Time CLosed). In settings, tap the settings button to switch between modes to set these times. Refer to the volumetric weight table on the previous page for the max and minimum weights achievable in a single dose. The weight can go higher by setting the dispenser to dose twice for that material.



The material adjustment is made using the adjustment slider pictured here. The two wing nuts that are arranged one directly above the other, are loosened to allow the adjustment slide to move freely, then tightened to hold it in place. (The wingnut at the end of the adjustment slide is there just to provide a grip point) You will need to test the amount of material dispensed and adjust the slider to increase or lower the amount of material dispensed.

To enter calibration mode, change the timer to P5 for the hopper that's being adjusted (by going into settings and pressing the up/down arrows until you reach the right program.) This leaves the dispenser empty after each dose, and allows you to easily adjust the amount of material. If you're producing smaller blocks, then a single dose from both sides of the volumetric dispenser will probably be fine, but if you're running larger bags, especially at high ratios like 70/30 or 80/20, then you may need to program one or both sides to dose twice. Do this by increasing the loop number to 2 or more.

To set the loop number, enter settings and adjust the Program number to P4 (normal production for volumetric) or P5 (volumetric calibration), then press the settings button again to cycle through OP (time OPEN) CL (time CLOSED) and LP (number of LOOPS). Once you're on LP, increase the number to 2, then hold the settings button for 3 seconds to exit settings.

Production

The foot switch triggers all three controllers simultaneously. If the pellets have been idle for a while and you're using the timed dispenser, first dispense them one at a time by pressing the Trigger button on the timer, and recycle the material. We do this because the flow will be lower when the pellets have been sitting for a while. After that, just put a bag under the cone and press the foot switch and all three materials will dispense at the same time. Once the material has dispensed, remove the bag and get another one and so forth.

It can be useful to keep a notebook or whiteboard with times that have been calibrated for different material or different sizes of bags so that you can switch between sizes without having to recalibrate each time.

Maintenance

Like any piece of equipment, Thor needs some TLC from time to time.

Each time you run it:

- Add a drop of pneumatic tool oil to the end of the air line where it plugs into the compressor. Don't overdo it, one drop will be fine. This lubricates the air cylinders that run the solids. A drop in the inlet will lubricate the air and keep things running smoothly.
- Clean the inside of the cone out at the end of the run. Crud can build up inside there and plug it up over time if you don't wipe it out regularly. Make sure to disconnect the air before reaching inside.

Every other month, or if you are having irregular weights:

- Remove the main dispenser plate from the machine and clean it out well. Make sure you've emptied the hoppers first, as everything inside can quickly become outside if you don't. You will need to remove the air lines from the air cylinders. Then, remove the dispenser from the bottom of the hopper with 5 bolts, and the cone with two additional bolts or lynch pins. Wash it out well, paying special attention to the tracks where the shutters slide. It may be helpful to remove the shutters.
- Once everything is cleaned up, let it dry out well, then reassemble and reattach to the bottom of the hopper.

FAQ

There's water or something in the gauge of the water pressure regulator. Is this normal?

-Yes. Most units use an oil-filled gauge. It's there to protect the needle from sudden pressure spikes. If it's not there on yours, that's not a problem. This setup doesn't require the oil, but some suppliers we buy from have it standard, so we just let it be.

My bag weight falls when the sprinkler/toilet/sink etc. is being used. What's up with that?

-Thor Comes with a pressure regulator to keep fluctuating pressure from affecting bag weight, but it does need to be set up correctly. When the pressure is low (when the sprinkler etc. is running) run the water system and see what the top pressure is on the pressure regulator. Now adjust the regulator to keep the pressure 5psi or so below that by adjusting the screw on the cap of the regulator. Be aware that the pressure will not go down when you adjust it without dispensing the water in the tank, because there's nowhere for the extra pressure to go. When you adjust the regulator up, it will change slowly because it has to fill the tank up to the new pressure, so it isn't immediate. Also, the pressure regulator cannot raise the pressure beyond your water supply's pressure.

It can also be very helpful to avoid any other water use while bagging, if possible.

One hopper, or the water, just keeps dumping when I hit the foot switch.

-Usually it's a setting on the timer that got messed up. The most common issue is the decimal on the top number. While adjusting the time, if the Pause/Trigger button is pressed, then the decimal shifts. Go back into the settings by holding the Set button for 3 seconds, then once the P0 starts to blink, tap the Set button again to make the top numbers blink. Now press the Pause/Trigger button until the decimal is in the middle again, and nowhere else. Then hold the Set again to exit.



I'm on a well, and I'm getting inconsistent water additions. What can I do?

The water system uses the balance of pressure between the water source, the pressure regulator, and the water tank to dose a consistent amount of water in each bag. Most water utilities run between 60-80psi, so that's what I designed it for. The regulator is pre-set to 50psi+ to compensate for pressure fluctuations due to other water draws on the line.

If you're on a well, oftentimes there will be a tank that has a high/low pressure switch on it that runs the well pump. The pump will run until the pressure is at the high setting, often 60psi, then turn off until enough water has been used to drop the pressure in the tank to the low point, often 40psi, though both high and low vary. If this is the case for you, then you'll want to verify what the low pressure setting is and set the pressure regulator no higher than that, so in the example I gave that would be 40psi.

When the pressure regulator is lowered, then you also need to adjust the pressure on the water tank. There is a blue cap on the opposite side of the tank from the water inlet where there is a standard Schrader valve, like on a car tire. You can use the tire pressure gauge from your car if you have one, or a bike tire pump to check the pressure, but you want the pressure on the tank to be less than half the pressure at the regulator. I would drop it down to 10-15psi in this example.

More will be added to manowarinnovations.com as questions are asked. If you run into issues, please go to the Find Out More section at the bottom of the home page to ask any questions or provide any feedback.

Controller Quick Reference

Hold Set (settings) 3 sec to enter/exit settings

Tap Set to cycle through settings for each program.

P0: Normal timer dispensing

P4: Normal volumetric dispensing

P5: Volumetric calibration

-No other programs should be used.

Each program has different settings.

P0 - Only OP (Time OPEN)

P4 - OP (Time OPEN)

& CL (Time CLOSED)

P5 LP (Number of LOOPS)

Change decimal placement:

In settings, go to the time you're adjusting and tap the Pause/Trigger button to cycle the decimal location.

Backlight settings:

When NOT in settings, hold Pause/Trigger for 3 sec until the screen flashes saying ON or OFF. ON means the light will go to power savings mode after a few minutes of inactivity. OFF means the backlight stays on.

