

MHEproducts.com

DrillPump3 Instruction Manual

Ver. 1.00, July, 3 2018 **DRAFT**

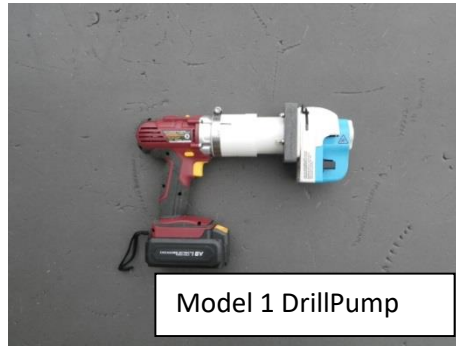


Congratulations! We hope that you enjoy your new DrillPump Model 3, and that it will assist you with your field work for many years to come. The DrillPump is simply a modified 20V Li Ion drill fitted with adaptors to operate a Masterflex EasyLoad 3 peristaltic pump head (the adaptor will also operate most other Masterflex peristaltic pump heads).



Please take to time to read the provided manufacturers literature for the cordless drill and Masterflex EasyLoad 3 pump head.

The original Model 1 DrillPump accepted a drive bit into the drill's keyless chuck for operating the pump head. The drive bit could be removed if the drill portion of the DrillPump is to be used as a drill.



While this flexibility was built into the Model 1, few customers ever disconnected their drill from the DrillPump, and it made the DrillPump Model 1 about 1.5" longer than the DrillPump Model 2.

The Model 2 DrillPump was 1.5" shorter than the Model 1 because the drill's keyless chuck is replaced by a drive adapter.



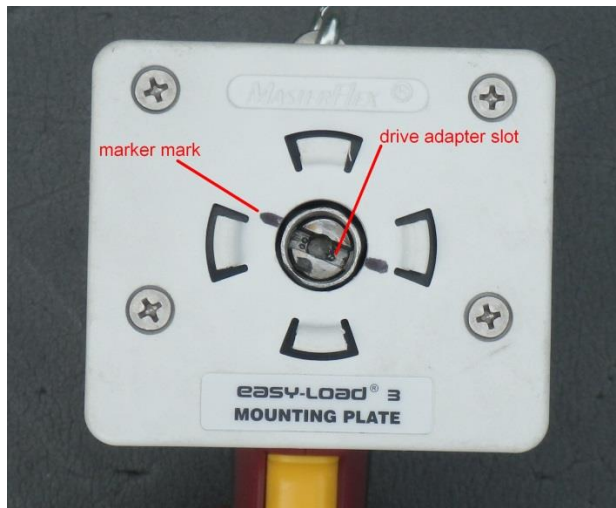
With the DrillPump3 the configuration of the drill allowed me to simplify the design and further compact the profile of the tool.



Drillpump3 equipped with a Masterflex EasyLoad3 pump head.

Pump Head Installation

The default method of mounting the Easyload 3 pump head on the DrillPump is to align the slot of the drive adapter with the marker marks on the Easyload 3 Mounting Plate. Similarly, align the projection on the pump with the marker marks. Many other orientations are possible.



Align the pump projection with the drive adapter slot and put together. You should feel the two parts “fit together”. Then rotate the pump head clockwise ~30 degrees to bayonet-lock the two units together. You should hear a “click” as the two parts lock together.



This process is reversed to remove the pump head from the DrillPump body. First the release tab is lightly pulled and held while the pump head is rotated counterclockwise for ~30 degrees, unlocked, and then removed from the DrillPump body.



The default orientation of the pump is a simple horizontal configuration with the tubing entering and exiting from the bottom of the DrillPump:

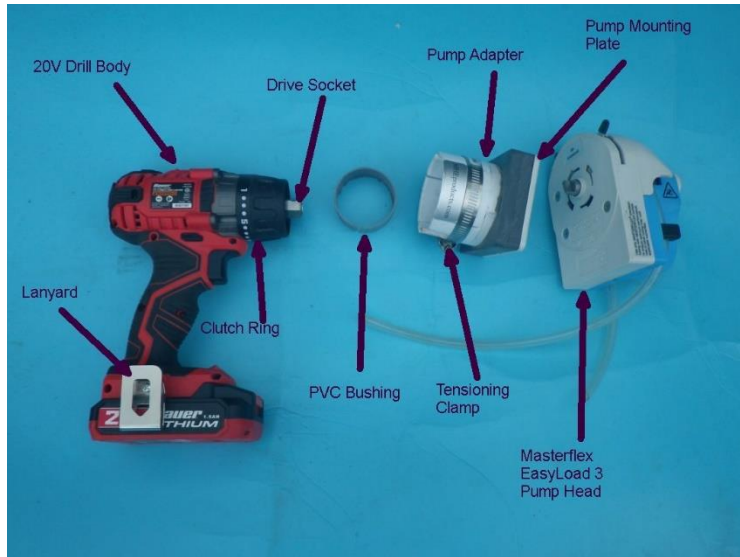


The pump adapter is shipped attached to the drill body and adjusted to provide smooth operation. Do not move or remove it unless necessary. If the Tensioning Clamp is loosened, before the pump is operated again, the pump head should be removed from the Mounting Plate and the position of the Drive Socket Adapter should be checked for center. When the pump adapter is centered and fully pushed onto the drill clutch adjustment knob.



Assembly and Disassembly

Here is an exploded view of the DrillPump3:



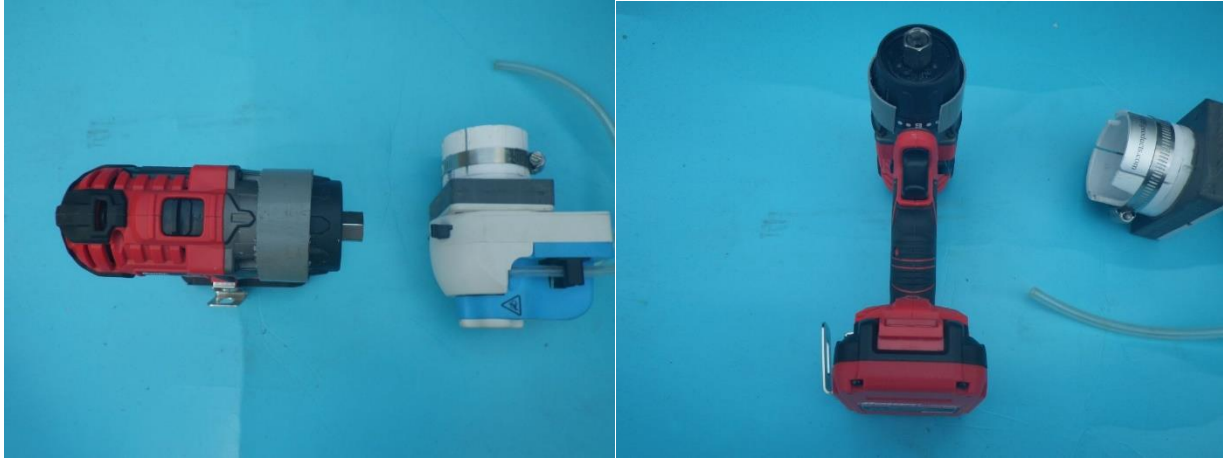
Here is the partially assembled DrillPump3:



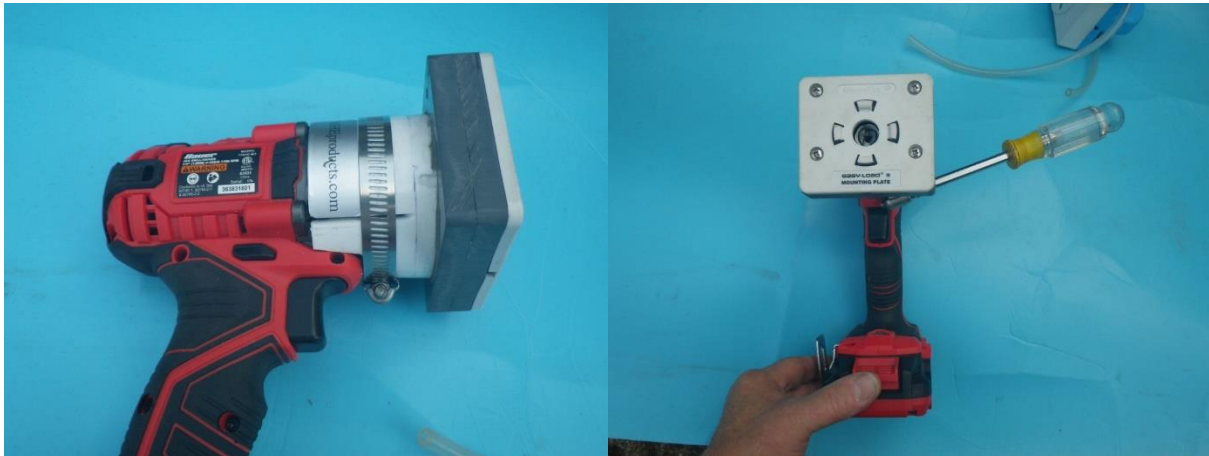
Prior to assembly, make sure that the clutch on the drill is set to the maximum (>21) or drill bit icon:



To assemble the DrillPump, place the PVC Bushing on to the clutch until it abutts the arrow.



Make sure the Tensioning Clamp around the Pump Adapter is snug but not tight. Slide the assembled pump adapter unit fully on to the bushing and clutch adjustment with the notch on the bottom of the pump adapter around the drill trigger assembly.



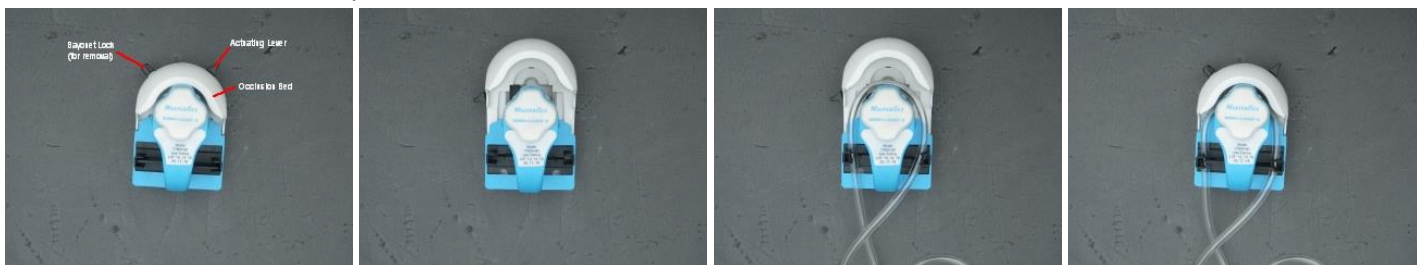
Once everything is assembled and aligned, tighten down the Tensioning Clamp with a 5/16" nut driver or socket wrench. While there is a screwdriver notch in the screw of the Tensioning Clamp, we do not recommend tightening the clamp with just a screwdriver.

A carrying bag is provided to hold the DrillPump3, an extra battery, and a charger with lots of room remaining for a roll of tubing etc.



Loading Tubing in Easyload 3 Pump Head

Loading tubing is easy. Different tubing diameters yield different flow ranges. MHEproducts.com offers two of the most common sizes available. Simply rotate the Actuator Lever from the 2 o'clock position counterclockwise to the 8 o'clock position, raising the Occlusion Bed of the pump head, and exposing the Drive Rollers. Loop the tubing through a Tubing Retainer, over the rollers and through the opposing Tubing Retainer. While keeping a small amount of tension on the tubing, return the Actuator Lever to the 2 o'clock position.



Using the Speed Control

A prototype Speed Control cam is provided with your drill for hands-free operation. Slide the zip-tie to the top of the drill handle and depress the trigger just enough to slide on the Speed Control cam. Turn the cam to increase-decrease the speed. Slide the control out of the way when not in use.



Minimum Speed



Maximum Speed

Operating Hints and Suggestions

- Do not run the pump at its maximum speed in the Speed 2 range for very long as this will greatly shorten the life of the peristaltic tubing. Water pumped peristaltically at high speed is greatly agitated, and dissolved gasses may nucleate and form a separate phase in the pumped flow.
- Do not run pump for too long without liquid in the tubing as this will heat up the tubing and also shorten the life of the tubing.
- If you use a longer length of peristaltic tubing than the minimum, you can periodically use a different part of that tubing over the rollers at different times during the pumping to extend the overall life of the tubing.
- If the pump is to be laid down on the ground or other dirty surface during its operation, place something non-friable (piece of plastic or cardboard) under the pump head during its operation to keep dirt, etc. out of the rollers.
- A lanyard is provided to hang the pump from a neck strap or some other convenient hanging point during operation. This, along with the use of the Speed Control cam, allows convenient hands-free operation.
- Remember to charge both batteries prior to going out to the field. They tend to lose some charge during storage.

- The DrillPump should run very smoothly without any grinding, vibration, or other inefficiencies. If you notice non-smooth operation, remove the pump head and check to make sure that the Drive Socket is centered in opening of the DrillPump Adapter, that it is tightly attached to the drill body, and that the DrillPump Adapter is fully covering the entire clutch adjustment knob on the drill body.