INSTALLATION INSTRUCTIONS FOR THE SIMPLE PUMP SOLAR-POWERED MOTORIZED PACKAGE

(SOLAR MOTOR OPTION)

LAST UPDATED: June 2, 2023

(The following instructions are very detailed, and should tell you everything you need to know. If you have questions, please phone 877-492-8711, ext. 6)

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INTRODUCTION

Thank you for purchasing a Simple Pump gear motor assembly. This Weather Resistant Motorized Pump with Linear Bearing Link Drive (LBLDWR) is designed for use with the Simple Pump model 100, 125, and 200 hand pumps. When installed on the Model 100, it delivers up to 1.0 GPM from a totally dynamic head (TDH) limit of 225 feet. When installed on the Model 125, the gear motor is capable of delivering up to 2.0 gallons of water per minute (GPM) from a total dynamic head (TDH) limit of 150 feet. When installed on the Model 200, it delivers up to 4.5 GPM from a totally dynamic head (TDH) limit of 60 feet. See detailed limits below.

The linear bearing link drive translates the rotary action of the 24 VDC gear motor to move the pump rod up and down on a precision ground and polished stainless shaft guided by two linear TEFLON bearing carriers.

The Motorized System weighs about thirty (30) pounds, so depending on your level of strength, you may want to perform this installation with a helper.

SPECIFICATIONS

Motor Rating	.151 HP continuous
Gear Ratio	30:1 @ 91.0% efficiency
Output Torque	195 in/lbs. continuous
Output Torque Maximum	400 in/lbs. @45.9RPM @ 16.63 amps
Nominal Output RPM	60.1
Efficiency	64.24%
Full Load Motor Current	7.32 amps
Allowable Voltage Range	24 to 30 VDC
Typical temperature of casing, operating in 72°F ambient	110° Fahrenheit

RECOMMENDED OPERATING ENVIRONMENT AND APPLICATIONS

AMBIENT TEMPERATURE

DC motors operating in ambient temperatures above 100°F lose operating efficiency -- the hotter the ambient temperature, the less efficient. If the temperature at the planned site regularly peaks above 100°F, we recommend operation of the motor in shade. The component box needs to be mounted near the batteries and out of the sun in a protected environment as it contains electrical equipment.

CONSISTENT SOURCE OF DC POWER

As with any DC motor, precaution must be taken to prevent operation under low voltage conditions -- below 23.5V with the 24VDC model. The provided charge controller already has Low Voltage Disconnect (LVD) capabilities built in. See the instruction manual provided for details.

RECOMMENDED PUMPING CONFIGURATION

The solar charged, DC powered Simple Pump is an integrated, standardized system that will provide water within a specified head limit. This head limit is based on the pumping cylinder that is used. Please see the table below for the different head limits. The Total Dynamic Head (TDH) is a combination of up to three factors, not all factors apply to every installation.

1. The lift from the static water level. (Example - 85’)
2. Any vertical distance from the well head. (Example – 15’)
3. Any pressure that is being pumped (1 PSI = 2.31’, 45PSI ≈ 100’)

When calculating your TDH, evaluate your specific application and determine how many of the three you need to account for in your application.

See example below. The well has a 78' static water level, the water is being lifted an additional 16' above ground level, and is being pumped into a pressure tank. This particular application would require the 100CA.

Static Water Level – 78'

Additional Vertical Lift – 16'

Pressure – 100' (45 PSI)

Total Dynamic Head (TDH) – 194'

Cylinder Assembly	24VDC TDH Limit
100CA	225'
125CA-82515	150'
200CA	60'

Please evaluate your application to ensure that it fits within the limits of the system. If your desired application exceeds the limits of our system, there are alternative ways to meet your goals. The best way to reduce the TDH on our system is to find an alternative way to pump into pressure. Using an ambient (i.e. non-pressurized) storage tank along with a small DC powered transfer pump will allow you to pump the water into your pressure tank. The Simple Pump would be used to bring water to the surface and fill the ambient tank. The transfer pump would pump the water from the ambient storage tank into the pressurized system.

Since needs for tank volume and pumping capacity will vary greatly, we do not provide the ambient tank or transfer motor.

Tanks: See the range of Bushman drinking water storage tanks, on the bottom of the following web page: https://www.loomistank.com/homeowners

Transfer pump: Pumps designed specifically for this job are available from a number of vendors, e.g. Dankoff, Surflo and Jabsco. Price range depends on the manufacturer and model, anywhere from $150-$1000.

This configuration raises the overall reliability and longevity of the system. Transfer pumps include an integrated pressure switch. The switch turns the transfer pump on and off, according to a target pressure. If you are able to use the Simple Pump to pump into pressure, we STRONGLY suggest that you wire in a pressure switch to control the ON/OFF state of the system (See Section 10 for details). If the pump is not controlled in this way and is left on, it could exceed the allowed pressure and potentially damage both the pressure tank and/or the Simple Pump gear motor. If you have any questions or concerns about your application and the limits explained above, please call us at 877-492-8711, extension 6.

UNSUPPORTED APPLICATIONS

Operating the Motorized System (LBLDWR Option) in certain configurations voids its warranty.

- Exceeding the rated total dynamic head limit of the Motorized System.
- Not performing normal maintenance events

SOLAR POWER SOURCE

Choose a location as close to the well as possible and practical, this helps eliminate any voltage drop between components (i.e loss of available power). Keep in mind the cables provided for the connection from the solar panels to the control box are 25’ in length. (Custom lengths are also available, however the gauge of the wire may need to increase depending on the length required.)

Also keep in mind that the solar panels will need to be facing south and should be positioned such that they are not shaded by any other structures, plants, trees, or even the pump itself.

Batteries

You will need two 12v batteries, Group 27 or 31 Deep Cycle (from almost any auto parts store) and minimum 100 amp-hour rating.

Lead acid will be the least expensive, probably around $125.00 each on sale. AGM will be about three times what the lead acid cost but will provide longer run time.

Battery storage is left to you to determine, following is guidance on what to think about when picking an enclosure. The batteries need to be kept clean and dry at all times, out of the rain, snow, ice, and direct sunlight, to increase longevity. The battery enclosure should be high enough off the ground or sealed to avoid rain runoff and snow accumulation (if applicable). This system requires that you place the batteries as close to the well head as possible in an enclosure meeting the description above. The cables provided to connect the batteries to the control box are 4’ in length. The cables provided to connect from the control box to the drive system are 12’ in length. We recommend that both the batteries and the control box are stored in the same enclosure/building/location.

PROFESSIONAL HELP?

If this is more complex than you planned, there are alternatives.

Anyone with NABCEP (North American Board of Energy Practitioners) certification, *and* experience configuring off-grid systems, is almost certainly qualified to help. However, while all NABCEP-certified professionals must learn about off-grid systems, most pursue grid-tie solar systems -- a very different field. This is why it is important to ask about recent experience.

SECTION 1: UNPACKING AND TOOLS REQUIRED

Carefully unpack all items from all boxes and the crate (if panels and mounting hardware purchased).

CONTENTS OF CRATE

(2) Solar Panels

(1) Pole Mount Kit

(1) 4” x 9’ Galvanized Pole w/ threads on one end

(1) 4” x 3.5’ Galvanized Pole w/ threads on one end

(1) 4” Galvanized coupling

CONTENTS OF BOXES

(1) 24VDC LBLD Assembly, with aluminum gear motor cover and linkage cover

(1) 15” x 15” Control Box (charge controller, timer, solenoid, fuse blocks, and terminal block)

(2) Control box mounting brackets w/ bolts

(4) 10-32x3/8” Stainless bolts for control box mounting brackets

(2) 25’ solar cables (white/black w/ MC4 connectors

(2) 12’ load cables (red/black) w/ MC4 connectors

(2) 4’ battery cables (red/black) w/ MC4 and loose ring connectors

(1) 2’ battery jumper w/ ring connectors

(1) 3/4” x 13" stainless steel pump rod extension

(4) 1/4-20 x 3/4" SS SHCS fasteners for mounting the LBLD to the pump head

(4) 15A (24V) ATO/ATC prong style fuses (spares)

(1) MM/F MC4 Branch Connector

(1) FF/M MC4 Branch Connector

TOOLS REQUIRED

(4) Allen wrenches: 9/64", 3/16", 5/16"

(2) Channel lock pliers

(1) Level

(1) Medium Phillips screwdriver

SECTION 2: POWER SOURCE AND CONTROL BOX INSTALLATION AND STORAGE

POWER SOURCE RECOMMENDATIONS

The power source for these motorized systems are deep cycle batteries. The system is not designed to run panel direct, meaning that you cannot directly connect the output of the panels to our motorized system. The provided charge controller will manage the charging of the batteries. The charge controller has a built in Low Voltage Disconnect (LVD) to manage when the batteries drain below the required voltage.

LOCATION AND STORAGE

To avoid increased voltage drop we recommend that the power source and control box be located as close to the well head as possible. We provide two sets of cables with this system. The cables to connect the batteries to the control box are 4’ long, so you will need to make sure the control box is within close proximity to the batteries. The cables to connect the control box to the motorized system are 12’ long, so the location of the batteries and control box need to be within this proximity to the motorized system/well head.

Both the batteries and the control box will need to be in protected storage. Storage should protect the power source and control box from the elements including, rain, snow, and direct sunlight. NOTE: The control box is mildly weather resistant, but definitely not weather proof.

BATTERY CONNECTIONS

Once the 12V batteries are placed in their final location it is time to make the series connection. This will take them from being two 12V batteries to one 24V bank. You will want to get the positive terminal from one battery close to the negative terminal on the other battery. We have provided a 2’ piece of black 10ga cable, plus two ring connectors. Cut the cable to the correct length and crimp on the ring connectors. Using the jumper provided connect the positive terminal on the first battery to the negative terminal on the second battery. At this point the negative terminal on the first battery and the positive terminal on the second battery are not being used, we will connect them to the control box later.

SECTION 3: SOLAR PANELS AND MOUNT

Photo is the example of the mounting hardware we provide standard. If you have purchased your own pole or roof mount hardware it should have its own assembly instructions. The instructions for our standard pole mount system will be provided inside of its box.

GENERAL TIPS FOR INSTALLING THE POLE-MOUNT SYSTEM

- We suggest you set the pole as the first step. The concrete will require a couple days to dry, so this will give you time to install the pump and or drive system in between.
- Make your hole at least 3 feet deep and 10 inches in diameter, with post hole digger or by hand.
- Determine if you need to use the 3.5' pole extension and coupling. If this is required due to the desired height of the panels, you will want to either weld the pole to the coupling once threaded, or drill through and put a large bolt through. This will keep it from turning in heavy winds.
- Place the pole in the hole, check the pole is vertical using a level, and brace to stabilize position.
- We suggest three (3), fifty (50) pound bags of fence post concrete.
- Allow concrete 2 days to dry before mounting the panels.
- Follow the instructions provided with the pole mount system to complete the installation of the provided solar panels.
- Run the conduit and cables (white/black) provided for connecting the solar panels to the control box. DO NOT connect the cables to the solar panels or the control box at this point.
- Make sure all cabling is run cleanly using conduit and zip ties where needed.

NOTE ON GROUNDING

The modules are grounded in the J-box by means of a green bonding wire that attaches to the aluminum frame, which is then bolted to the aluminum bracket, that is bolted to the steel pipe, which is sunk in

the ground. Everything else in the system is in an, "above ground", configuration, i.e. not a chassis ground. If the batteries fail or melt down the MorningStar will isolate them from the system with its built-in circuit protections. (If the system takes a direct lightning strike nothing will save it.)

SECTION 4: LBLD ASSEMBLY PREPARATION

Using the 9/64" Allen wrench, remove the six screws that attach the linkage cover. Set it to the side, it will be installed later. Cut the zip tie that is securing the clevis, this was for shipping purposes only.

SECTION 5: PREPARING YOUR EXISTING PUMP

Your Simple Pump Hand Pump should already be installed and pumping water without any binding and with an overall smooth operation prior to attempting to install this gear motor.

You should confirm that your pump is delivering at least one gallon of water with approximately 25 strokes with the lever handle system (model 100). If you have the model 125, your pump should be delivering about one gallon of water in approximately 15 complete strokes. If you have the model 200, your pump should be delivering about one gallon of water in approximately 6 strokes.

Starting with a fully-functional lever-arm pump, what follows are the step-by-step installation instructions.

REMOVE THE LEVER ARM MECHANISM

Using the 3/16" Allen wrench, remove each of the four fasteners holding the lever arm mechanism to the pump head.

Remove the lever arm bracket and lever (they should still be connected) from the 3/4" stainless rod. These are reverse threads, the direction you screw is the opposite of normal -- turn clockwise to remove, rather than the normal counterclockwise.

Before adding the 13” Rod Extension you will need to verify the height of the existing Pump Rod. With the Pump Rod at the bottom position measure from the Rod Gland to the base of the threads on the Pump Rod. The Pump Rod will need to sit somewhere between level with the Rod Gland and 2.5” above it.

If the measurement is above 2.5”, it means that the lift rod protrusion above the top drop pipe was above the 4”-6” range specified in the hand pump installation instructions. In the event this needs to be fixed, please reference the hand pump installation instructions for details on how to make the adjustment.

Add the 13” Rod Extension to the top of the existing pump rod. As mentioned above, these are reverse threads so you will go counterclockwise to tighten. Use the two channel locks to tighten.

NOTE: When using the Motorized System, like with the Hand Pump, half of the Riser Tube must be below the well cap. This means that when using the PHA2 only 12” of Riser Tube can be showing above the well cap, when using the PHA47, only 24” can be showing.

SECTION 6: INSTALLATION

NOTE: The Motorized System weighs about thirty (30) pounds. We suggest that this portion of the installation be done with a helper.

Make sure the orientation of the unit is correct before taking the next step. The cabinet portion of the unit faces away from the pump head. The bottom of the unit is where the two MC4 style plugs are mounted.

The clevis will need to be in the bottom position for the installation. It is in the bottom position when the dog bone overlaps the crank arm fully as shown in the image to the right, circled in red.

Lower the assembly onto the pump head so that the pump rod and extension are inserted through three (3) openings. As the unit is lowered down, the rods move through the below pieces, in order.

- The lower linear bearing
- The clevis
- The top linear bearing

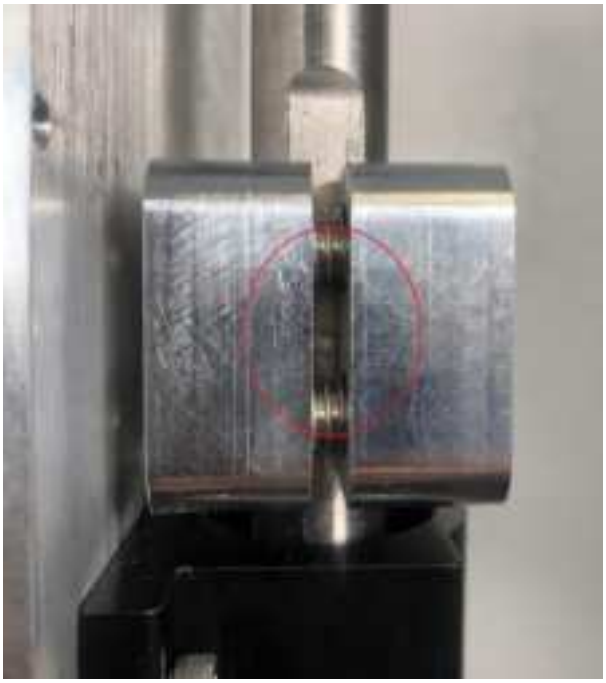
The tolerances are tight between the clevis ID and the shaft OD. You may need to wiggle the yoke while lowering the unit to get it to drop all the way down.

There is a 1/4" of space between the bearing housing and the top of the rod gland when the holes are fully aligned. The rod gland is the topmost exposed component on the pump head.

Screw the four 1/4-20x3/4" SS SHCS mounting bolts through the holes just aligned, fastening the mounting plate to the pump head.

This next step is very important. We will need to make sure the piston is in the correct position. To do this, grab the portion of the 13” rod extension that is sticking out of the top of the unit and pull up. The ideal location for the joint between the standard pump rod and the 13” extension is in the middle of the clevis, as shown in the photo to the right, circled in red. If your rod to pipe ratio is correct, you should need to lift the rod up to get it into the position explained above.

It may be necessary to wiggle the clevis in order to move the rod upward. With deeper static water levels, it could take a fair amount of force to lift the rod.



Then, using a 5/16" Allen wrench, tighten the two stainless steel socket head cap screws on the clevis. This pinches the clevis to the stainless rod. These need to be VERY tight. You will notice when you tighten one and move to the other it will appear loose. Keep tightening in sequence until both are tight.

SECTION 7: ALIGNMENT

The next step is to check/adjust the alignment of the pump rod with the linear bearings and the mounting plate. Completing this alignment will prevent any binding between the linear bearings and the pump rod.

Make sure all eight (8) 8-32x1/2 SS socket head cap screws that hold the top and bottom linear bearings to the mounting plate are loose. We won't tighten these fully until the alignment process is complete.

Remove the four (4) 8-32x1/2 SS socket head cap screws that are holding the top linear bearing in place. This step ONLY needs to be performed on the TOP linear bearing. Once removed compare the placement of the holes in the linear bearing with the holes threaded into the mounting plate. See image.

If these holes do not line up, it will likely be that the holes in the mounting plate are to the right of the holes in the linear bearing, as shown in the picture to the right. You want them to be lined up like the image to the bottom right with the green check mark.

The adjustment for this requires that you loosen the four (4) ¼-20x3/4 SS cap screws holding the unit to the pump head. Lift up on the bottom right corner of the mounting plate slightly and tighten the four mounting bolts. Check the alignment between the holes in the top linear bearing and the mounting plate again. Make as many adjustments as necessary to get the holes lined up like the image to the right.

Once alignment is verified make sure the ¼-20x3/4 SS cap screws holding the assembly to the pump head are fully tight. You can now put the four (4) 8-32x1/2 SS cap screws back into the top linear bearing. At this point just make these screws finger tight.

We will do final alignment adjustments in Section 7 below.

SECTION 8: ELECTRICAL CONNECTIONS

There are three different sets of cables provided with this system; PV (solar), battery and load.

CAUTION: MAKE SURE THAT THE ON/OFF SWITCH IS IN THE OFF POSITION WHEN MAKING ALL ELECTRICAL CONNECTIONS. THE SWITCH IS OFF WHEN THE BOTTOM IS DEPRESSED AND ON WHEN THE TOP IS DEPRESSED. THERE ARE PINCH POINTS IN THIS SYSTEM. EVEN IF YOU ARE CERTAIN THE SWITCH IS IN THE OFF POSITION, MAKE SURE THAT ALL PINCH POINTS ARE CLEAR.

PV (SOLAR)

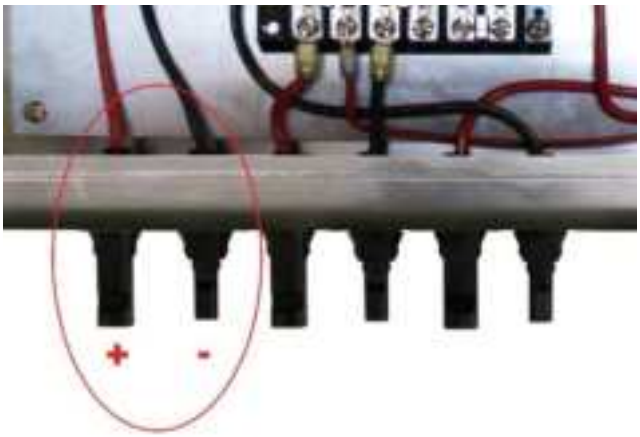
This will create a connection between the control box and the solar panels. If using our standard system, you have been provided with two branch connectors to put the panels in parallel. Using the branch connectors connect the positive leads from each panel together and the negative leads from each panel together.

Positive Branch Connector

Negative Branch Connector

You can now connect the PV cables to the branch connectors. Connect the white (+) cable to the positive branch connector. Connect the black (-) cable to the negative branch connector.

You can now connect the PV cables to the control box. The white (PV+) cable needs to be plugged into the left most MC4 connector on the control box. The black (PV-) cable needs to be plugged into the second from the left most MC4 connector on the control box. See image below. The control box is marked with PV+ and PV- just in front of the connector for more guidance.

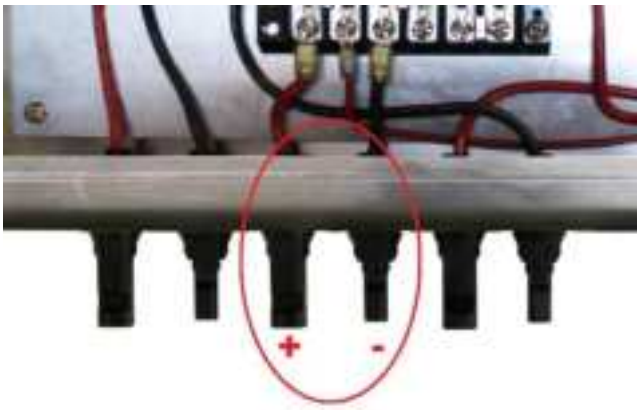


BATTERY

This will create a connection between the control box and the batteries. To reduce voltage drop you will want to place the batteries as close to the control box as possible. We have provided a set of 4' long cables with MC4 connectors on one end and loose ring connectors for the other end. With the control box mounted and the batteries in their set position, measure the distance between the two and cut to size. Crimp the ring connectors to the cables.

You can now connect the Battery cables to the battery. Connect the red (BAT+) cable using the ring connector to the remaining positive terminal on the one battery. Connect the black (BAT-) cable using the ring connector to the remaining negative terminal on the other battery.

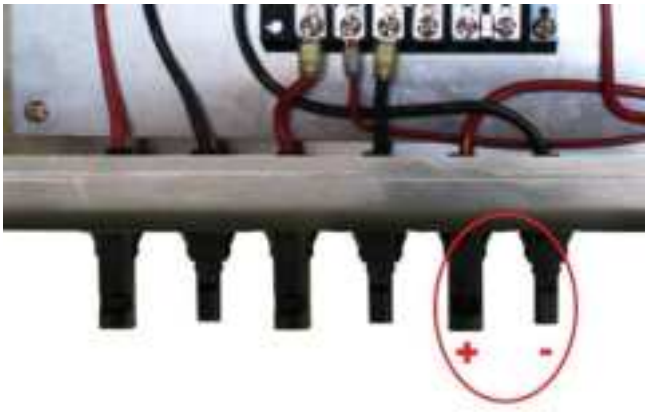
You can now connect the Battery cables to the control box. The red (BAT+) cable needs to be plugged into the third from the left MC4 connector. The black (BAT-) cable needs to be plugged into the fourth from the left MC4 connector. See image below. The control box is marked with BAT+ and BAT- just in front of the connector for more guidance.



LOAD

This will create a connection between the control box and the LBLD drive unit. Make sure the switch on the control box is in the off position. The off position is when the bottom of the switch is depressed in. Even if the switch is in the off position, make sure all pinch points are clear.

We have provided the two (2) 12’ cables for this connection. These cables already have MC4 connectors on both sides so do not cut or change their length. Use the red (LOAD+) cable to connect the two positive MC4 connectors between the control box and the drive unit. The LOAD+ connector on the control box is the second from the right. Use the black (LOAD-) cable to connect the two negative MC4 connectors between the control box and the drive unit. The LOAD- connector on the control box is on the far right. See image below. The control box is marked with LOAD+ and LOAD- just in front of the connector for more guidance.



The LBLD should now be fully powered!!!

SECTION 9: OPERATION

Now that the initial alignment is complete and the power has been connected, we can perform the initial startup. During the initial startup we will verify the alignment and tighten the linear bearings for the break in period.

NOTE: During the first startup and break-in period, leave the pump outlet open or pump through a short drinking-water quality garden hose unrestricted. We recommend a break-in period of 6 hours. Make sure your power source can provide adequate power for the break-in period.

CAUTION: The first startup will be done without the cover installed. This will expose pinch points so use extreme caution.

Turn the switch to the ON position. The unit should start to run. Let it run until you start to produce water. Once it is producing water you will need to tighten the screws on the linear bearings. We do this while the unit is running as it will center the linear bearing to a natural, non-binding position. BEWARE OF THE PINCH POINTS FOR THIS NEXT STEP. While the unit is running, tighten the top linear bearing first, only tighten the top two screws to avoid pinch points. Next, tighten the lower linear bearing, only tighten the bottom two screws to avoid pinch points.

Let the system run for about 5 minutes then turn it OFF and follow the two steps listed below.

1. DO NOT DO THIS STEP WITH THE SYSTEM RUNNING. Check the temperature of the pump rod that is sticking out above the unit. If it is ambient or a little warmer than ambient move to step two. If it is really hot there is a binding issue and you need to go back to the alignment step and re-verify. If you have verified and it continues to get really hot, please contact our technical support.
2. Tighten the remaining loose screws on both the top and bottom linear bearings, there should be four (4) left to tighten.

Attach the cover to the LBLD mechanism. Use your 9/64" Allen Wrench for the six (6) 8-32 SS SHCS that attached the cover to the mechanism's mounting plate.

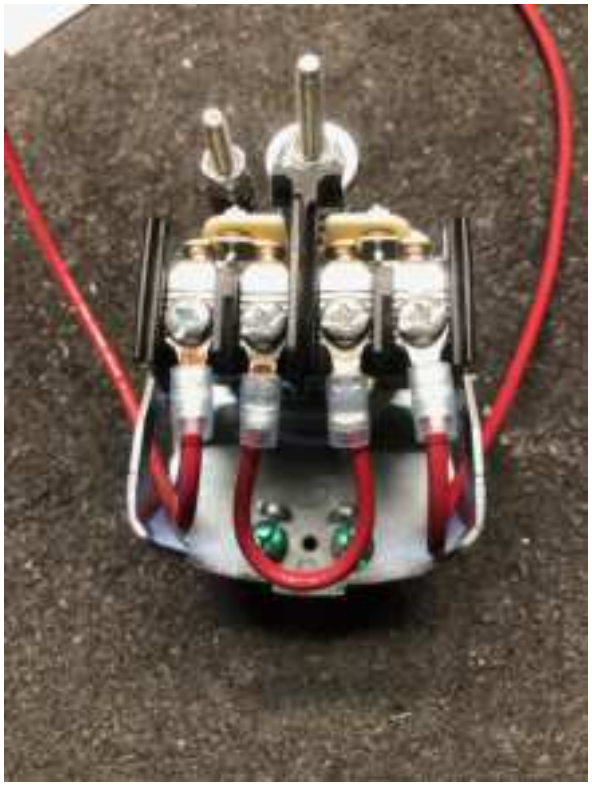
Start the system again and begin the 6-hour break-in period. During the break-in period, leave the pump outlet open or pump through a drinking-water quality garden hose unrestricted.

SECTION 10: INSTALLING A FLOAT OR PRESSURE SWITCH

If you are planning to utilize a float or a pressure switch, please follow the instructions below. Make sure to verify if pumping into pressure will work with your well specifications, you can find details in the RECOMMENDED PUMPING CONFIGURATION section on page 3.

With any float or pressure switch there should be a supply and return wire. This means there will be two wires. We have made it very easy to integrate these into our system. Inside the control box you will see a terminal block. There is currently a jumper on the bottom two most right terminals of the terminal block. Simply remove the jumper from the terminal block and add the supply wire to the left terminal and the return wire to the right terminal. See image below. The switch is now integrated.

If you are planning to integrate a pressure switch you can use a standard pressure switch. When using DC voltage, you can simply jumper the two middle terminals and add your supply wire to one of the outer terminals and the return wire to the other outer terminal.



Always consider the distance from the pressure switch to the control box when selecting the gauge of the wire you are going to use. A general rule of thumb can be found below.

1’ – 10’	16 gauge
11’-25’	14 gauge
26’-75’	12 gauge
> 75’	Utilize Voltage Drop Calculator found online

SECTION 11: TROUBLE-SHOOTING

BLOWING FUSES

As long as the gear motor system is pumping correctly and not causing the motor to overload, no maintenance is required. If the mechanism experiences a bearing failure for any reason, the motor protection fuse will blow. It is extremely important to replace the fuse with only a 15 amp ATO/ATC automotive style fuse. Using a higher amperage fuse will overheat the motor and damage the gears. The motor normally operates at around 100-110º F.

If the fuse has blown for any reason, remove the cover. Go back to the Alignment section

If the system continues to blow fuses after verifying the alignment, remove the motor mechanism and stroke the pump rod by hand. It should require about 40 lbs. of lifting effort for each 100 feet of static water level depth. If the effort is any more than this, something is binding in the pump system and it is not an issue with the drive system. Please reference the troubleshooting section of the pump installation instructions.

UNIT WILL NOT TURN ON

If the unit will not turn on there is likely an electrical issue, see a list of potential causes below. Make sure to disconnect the connection to the battery ground terminal before performing the steps below.

1. A fuse is blown and needs to be replaced. There are two fuse blocks, check both fuses and replace any that are blown. Reconnect battery ground connection and turn the system on.
2. The battery or batteries are low on voltage. Even though the charge controller has an LVD use a volt meter to check the voltage. For a 24VDC system make sure the voltage is above 23.5VDC.
3. One of the electrical connections is loose. Tighten all connections in the control box; terminal block, fuse blocks and solenoid. Reconnect the battery ground and try the system again.
4. Solenoids can fail over time. You will need to reconnect the battery ground before performing this next step. Be careful, the system will be energized.
    1) First verify there is power to the solenoid by using a volt meter to check the terminal on the left side. If there is power to the solenoid, move to step 2.
    2) With the switch on, check that there is voltage on the top left terminal of the solenoid. If there is voltage at this terminal, with the switch still on move to step 3
    3) Check if there is voltage at the terminal on the right side. If there is voltage, then the solenoid is not the problem. If there is no voltage, then the solenoid needs to be replaced.
5. The cable connections might not be fully connected. Take a closer look and make sure all cables are fully connected.

If none of the steps in this section help you solve your problem, please do not hesitate to call Simple Pump at 877.492.8711, extension 6.

SECTION 12: MAINTENANCE

ONGOING MAINTENANCE

As with any motorized system, there is vibration and motion in the assembly. Over time, this vibration and motion can cause bolts to loosen. If you are using the system on a normal basis, we recommend that you check all threaded connections within a couple weeks of initial installation, then about every 3-6 months after that.

As long as the Motorized System with the LBLD is pumping correctly and not causing the motor to overload, no additional maintenance is required for the LBLD motor component that is the subject of this manual.

The pump's seals must be replaced periodically -- typically every 5 to 10 years. (It can be more frequent for industrial applications, or any application pumping water with a significantly non-neutral pH, or high particulate levels.) Note that all of these are those that must be replaced on any Simple Pump system, no matter what configuration -- driven by hand, or motor. If the flow rate of your pump starts to fall, replacing the seals may well be the solution. Information about the periodic replacement of seals can be found in the INSTALLATION AND MAINTENANCE manual for the hand-operated system.

There is no requirement to oil any of the LDBD system components. Optionally, if you have the cover off, you can apply a bit of lubricating oil on the two points where ball bearings in the drive move during operation. However, do not under any circumstances apply oil to the linear bearings, or the 3/4" stainless steel rod that moves up and down within those two linear bearings. Also, there is no need to lubricate any component or surface on the motor itself.

SECTION 13: WARRANTY

The gear motor assembly is warranted against defective materials and workmanship for a period of 1 year from the date of purchase. The motor load must not be exceeded, and all instructions must be adhered to. The Morningstar MPPT controller should be registered and will fall under their manufacturers warranty. The timer and solenoid will be under warranty for a period of 1 year from the date of purchase.

All machined components that are not wear items have a lifetime warranty. The wear items in this system include the two linear bearings, brass shims and two ball bearings pressed into the dog bone. Warranty is void given any one of the situations explained below.

1. If the system was not installed per these instructions.
2. If the system is pushed beyond the limits explained in these instructions.
3. If the system is not maintained on a normal basis.