

# INSTALLATION MANUAL

## Pump: Merlin3

Please read all instructions carefully before installation.

Check List Before Installation:

- ✓ Test water for purity, unusual PH and/or acidic levels. Check with your local health department for test procedures.
- ✓ Test well draw down. API Solar Pumps CAN NOT run dry. This will cause damage.
- ✓ Measure the diameter of the well casing to insure you have the proper size well seal. M3 Series Pump requires a minimum 4IN well casing inside diameter (ID).
- ✓ Power Source 12-32VDC

Tools Needed:

- Adjustable Pliers
- Philips & Flat Head Screwdrivers
- Electrical Tape (1/2IN recommended)
- Electrical Term Crimpers
- Knife
- Small awl or drill bit
- Pipe cutters
- SAE Ratchet & Socket Wrenches

Additional Items:

- Drop Pipe: 1/2IN PVC Pipe/Black Poly Pipe
- Fittings and Adapters for down hole pipe
- PVC Glue & Cleaner
- Well Seal
- 12-32VDC Power Source
- PVC Fitting



REQUIREMENTS: Well Casing: 4 inch ID or larger  
1/2 inch Female NPT Coupling depending on drop pipe used.

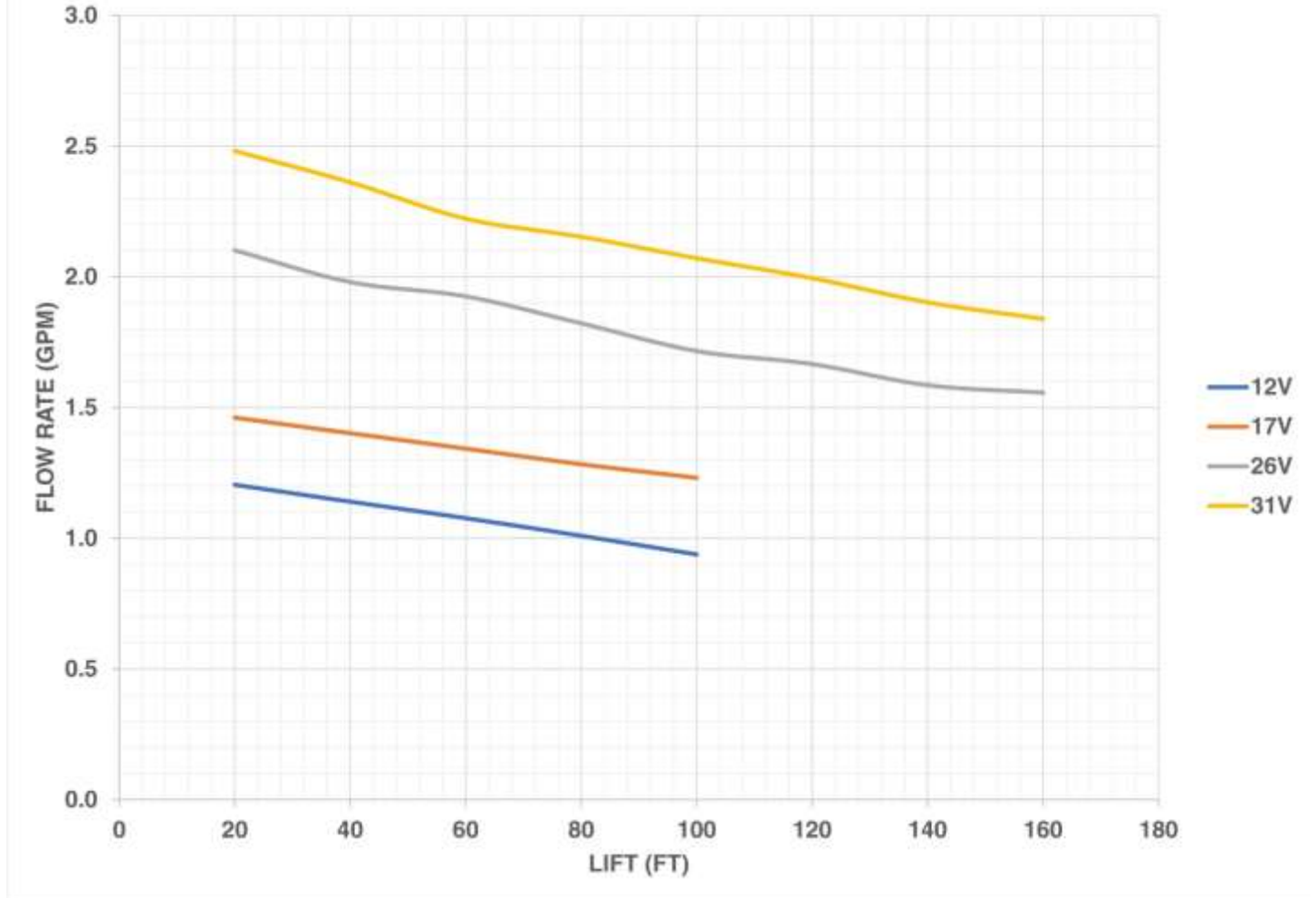
SPECS:

|   |  |
|---|--|
| Maximum Operating Pressure: 65PSI (150FT vertical lift)             | Maximum GPM with no head pressure: 3.0 GPM     |
| Maximum Depth Under Static Water Level: 100FT                       | Maximum Operating Temperature in water: 100°F  |
| CNC manufactured and engineered tough lifetime 304 Stainless steel. | Anodized for Abrasion and Corrosion Resistance |
| 180W 1/5HP Brushless 12-32 VDC Heavy Duty Motor                     | Sensor-less Internal Frequency Driver          |
| Limited Overvoltage Protection up to 50VDC                          | Thermal Protection                             |
| Reverse Polarity Protection   | Positive Displacement                          |
| Factory Rebuildable   | Temporary Run Dry Capability                   |
| Pressure relief valve   |  |

FEATURES:

- 2 Year Manufacturing Warranty (additional warranty available for purchase)
- Standard 100FT of 14-2 pump cable built into pump.
- An additional 50 or 100 FT of wire may be purchased and added to the pump.
- No underwater splice is needed.

M3 SOLAR PUMP FLOW CHART



Preparing Your Solar Pump for Install-

1. Lay the pump on the ground near the well and unroll the wire. If you use poly pipe/black roll as drop pipe, we recommend using a short piece of PVC pipe (approximately 3 feet) at the pump and at the top of the well for appropriate surface length. The PVC is more rigid, allowing a cleaner installation and freeze-proof. Pump settings deeper than 150FT use 1/2IN poly pipe but still use the 1IN PVC pipe for the surface.
2. Attach the drop pipe to the pump using a 1/2IN adapter and clamps. See FIGURE 2.A Using electrical tape or zip ties, attach the pump wire to the poly pipe every 5 feet to 8 feet allowing some slack in the wire.
3. To help protect your pump against debris in your well, install our [Nylon Pre-Filter Kit](#) if needed.

### Installing Your Pump in the Well-

1. You can plumb the well seal before installing the pump in the well if you know the depth the pump will be set at in the well. Secure the pump wire ends and lower the pump in the well at the desired depth. Once you have set the pump, finish plumbing from the well to the storage tank using the poly, PVC, or steel pipe and proper fittings.

#### TIP: For Freezing Climates

Below the ground frost level, make a freeze hole (1/16IN diameter) in the down hole pipe. This hole will allow water to drain below the frost level (NON pressure tank systems) every time the pump shuts off- it can be taped over in non-freezing weather. Make sure the pipe leading to the storage tank drains properly to the storage tank. DO NOT allow over 2 feet of pipe to drain back to the well.

2. Install pump wire plug by pushing the correct color (Red=A) positive, (Black=B) negative wire into the provided bare plug. The FM plug has "A" and "B" markings in raised black lettering on the plug, see FIGURE 2.B. The small green seals on the wire can now be pushed into the opening then squeeze the lock until it snaps. Connect the Female plug (coming from the solar module junction box) to the pump wire Male plug.

FIGURE 2.A

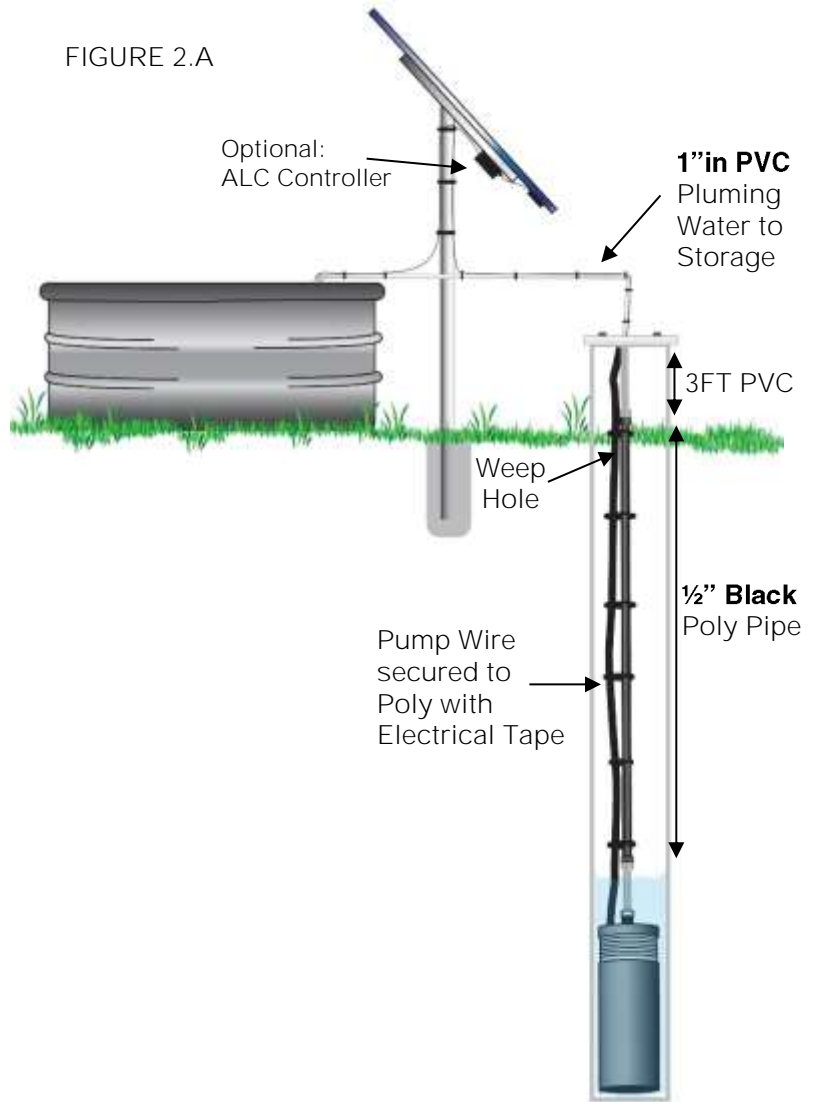
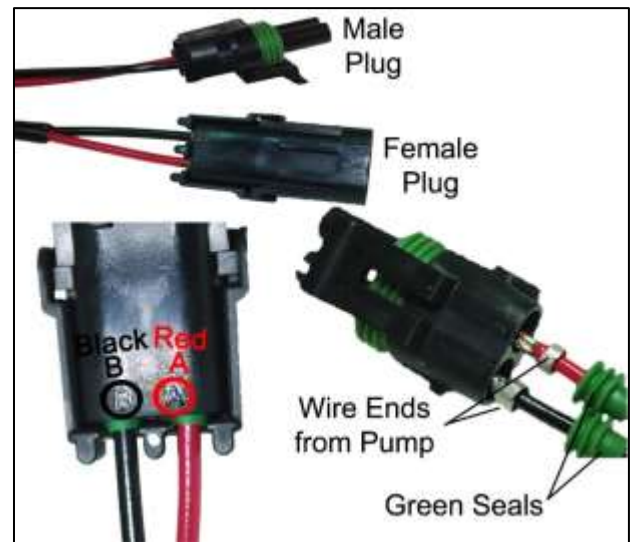


FIGURE 2.C  
Be sure that the weatherpack terminals are even at the ends before putting plastic weatherpack plug on. This ensures they lock in correctly.



FIGURE 2.B  
Connectors simply plug together. **Please do not use excessive force**, as this may damage connector. The systems come prewired so there is no need to open the junction box on the back of the solar module.



## TROUBLE SHOOTING

If you experience issues while installing your product or trouble shooting, please contact our technicians so we can assist you.

1. The pump is running but not delivering water: Turn the pump off by disconnecting leads or plug water sensor ends together the shake the pump up and down in the well. Then, turn the pump on again by reconnecting leads. If it now pumps water but slowly, this means that the pump screen is plugging with debris in well. Possible fixes for this problem could include: bailing the well or raising the pump in the well. If you are using a [Nylon Pre-Filter Kit](#), it may be plugged with well debris. Remove it from the pump and wash.
2. The pump is not delivering full flow: The pump screen may be plugged. Refer to problem #1 above. Another possibility may be low power to the pump. Using a DC volt meter capable of 50 volts, check power going to the pump. Single panel (85 watt) systems deliver approximately 17 volts loaded and 22 volts unloaded. Two panel and larger systems (170 watts and more) deliver 34 to 36 volts loaded and 40 to 44 volts unloaded. Our large 60 cell, 260 watt panels deliver 31VDC loaded and 38VDC unloaded/open. If there is a problem in this area, be sure the system has been plugged together correctly. If everything is correct, but the pump does not perform correctly, please call for customer service.
3. The pump does not run at all: If your system does not have the [ALC 1275 water sensor](#), tests will have to be done with a 50-volt DC meter. Unplug the pump from the solar and using the meter, check the voltage output of the solar array. Single panel (85 watts & less) systems deliver approximately 17 volts loaded and 20 volts unloaded. Single panel 100 watt & all two panel systems (100 watts or more) deliver 34 to 36 volts loaded and 40-44 volts unloaded. If there is a problem in this area read the wire diagram carefully to make sure the system has been wired correctly. If everything is correct, but the pump does not perform correctly, call for customer service. If your system has the optional ALC 1275 water sensor, unplug both power in and out leads. Now plug the pump directly to the solar power plug. If the pump runs, check the tank sensor leads for damage. If there is damage, fix or replace the tank sensor leads with 16-22 gauge wire. If there is no damage, clean and scrape the ends of the water sensor wire and re-install. If this does not fix the problem, there could possibly be internal damage to the ALC 1275 water sensor. Please contact customer service.

### Important Steps When Installing:

**Tampering with fasteners, unauthorized modifications,  
or disassembling products WILL VOID ANY WARRANTY!**

1. No additional controller is required for API solar water pumps, however the [ALC 1275 water level controller](#) greatly increases the life expectancy of our solar pumps and prevents unnecessary wear and tear on the pump.
2. All of API pumps have a pressure limit, to help prevent damage in case of excessive flow restriction. The SR2 has a 65 PSI limit. Excessive pressure may damage the pump. When a controlled flow is needed, it is better to install an ALC 1275 water level controller and adjust the solar array or install a pressure tank & switch.
3. Lifting water from a well to surface required PSI, proportional to lift. Please call our system specialists for proper conversion.
4. This is a Positive Displacement PUMP with NO pressure relief rated at 65 PSI but capable of 300 PSI. Please install with NO flow restriction or it can be damaged.
5. Please be sure your well has been tested for flow rate and continuous flow supply. In order to reach these water demands, your well must be able to keep up with the solar pump. Otherwise, damages can occur.
6. DO NOT remove the screen from the pump. Debris in the wall may damage pump (VOIDS WARRANTY). If you suspect your well is sandy, we offer a Nylon Pre-Filter Kit to filter sand from the pump. Please call for details.
7. The pump can run dry without damage, but debris can damage it over time. So please use filtering Sand Sock if possible. If you remove the Sand Sock from the pump and continue pumping sand and debris, it could possibly damage the pump.
8. If you need to splice the pump wire, use Rubber Splice tape, covered with electrical tape for good electrical connection & seal.

View our [website](#) for video installs, quick tips and more!