SAFETY INSTRUCTIONS

- The 12V Pump Controller can get warm. It is set to turn off at 65°C.
- Do not block the fan intake or exhaust vent during operation of the 12V Pump Controller.
- Do not touch the inside of the 12V Submersible Pump after it has been running – the motor module gets extremely hot.
- This 12V Submersible Pump is to only be used for groundwater purging/sampling.
- The 12V Pump Controller is water resistant but not waterproof. Do not submerge in water.
- Do not use the 12V Pump Controller near flammable liquids or gases.
- The 12V Submersible Pump is designed to operate when submerged only.
- The Solinst Model 415 12V Controller is only designed to work with the Solinst Model 415 12V Submersible Pump.

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Power Supply

The 12V Pump Controller operates from an external 12 volt DC power supply such as a car, truck or marine 12 volt battery that can supply up to 45 amps at maximum draw. The Pump Controller has a 2.3 m (7.5 ft) power cable with connector clips for direct battery connection.

The power cable clips are oversized for use with automotive batteries. The red clip connects to the positive (+) battery terminal, black to negative (-) battery terminal. If the battery is connected with reverse polarity the Controller will not be harmed, but it will NOT operate until the polarity is connected correctly (the LED on the Pump Controller will remain off with reverse polarity).

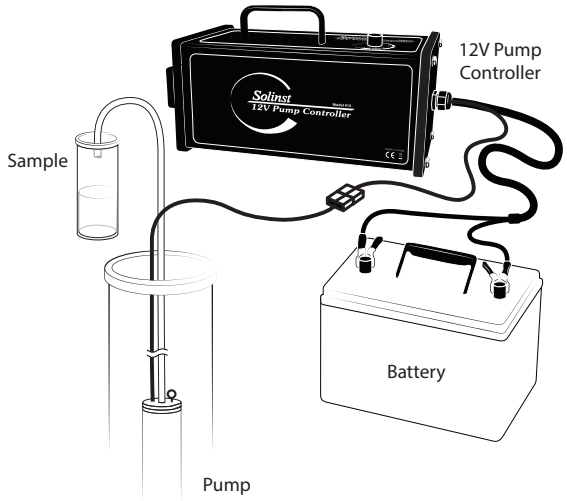
A circuit breaker reset button is located on the side of the Pump Controller. In the event the amperage exceeds 50 amps, the circuit breaker will trip (button pops out) and turn the Controller off. To reset the breaker, turn the dial to "0" then press the reset button back in to regain operation.

If the Pump is to be powered by a typical 45Ah vehicle battery, start the vehicle and run for 15 minutes to recharge the battery, then restart the vehicle every 15 minutes for 5 minutes to maintain the battery power during sampling.

Operation

- The Pump Controller should always be kept with the dial in the OFF position when it is being attached to a power source or stored.
- The Pump Controller dial is used to adjust the flow of water being discharged. As you increase the dial, so does the Controller's voltage output. This will enable the Pump motor to spin faster, therefore, increasing the flow of water being discharged. To slow the flow of water, turn the dial counter-clockwise.
- When the dial is in the OFF position the Controller will produce 0 volts, in the highest position "10" the Controller will output 25 volts.
- The Controller has a low voltage disconnect at 10 volts as indicated by the slowly flashing yellow light. (However, the Controller can disconnect at a higher voltage if the Pump's current increases, e.g. if the Pump is running at maximum current (20 amps), the battery can disconnect at 11.7 volts.) The Controller will shut off and then turn on every few seconds (pulsate) or the water flow from the Pump will slow if the output voltage on the battery drops to 10.75 volts when in use. Stop operation, disconnect the power, and recharge the battery.

1. Connect the negative (black) battery clip to the negative terminal post on a 12 volt DC battery and the positive (red) battery clip to the positive terminal.
2. Connect the Pump's cable to the connector cable from the Pump Controller.
3. Connect the 3/8" ID tubing to the Pump. Ensure the tubing is pushed all the way onto the tubing barb.
4. Lower the Pump to the required sampling depth. Use a safety line connected to the eyebolt on the top of the Pump, if desired (such as a Model 103 Tag Line).
5. Turn the dial to adjust the flow as desired.



Note: See Page 3 for dedicated set up using a 2" Well Cap Assembly.

Maximum Flow Rate Estimates	
Depth to Water	Flow Rate
30 ft (10 m)	12.5 L/min
40 ft (12 m)	11.0 L/min
50 ft (15 m)	9.5 L/min
70 ft (21 m)	7.5 L/min
80 ft (24 m)	6.0 L/min
100 ft (30 m)	4.25 L/min
110 ft (33.5 m)	1.5 L/min

Note: See Model 415 12V Submersible Pump data sheet for full pump curve.

Tubing Specifications	
1/2" OD x 3/8" ID LDPE (100 ft coil)	109490
1/2" OD x 3/8" ID LDPE (250 ft coil)	109489
1/2" OD x 3/8" ID LDPE (500 ft coil)	109488

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Troubleshooting

If the Pump or Controller fail to work, please try the following:

- Make sure the Pump is submerged and properly connected to the Controller.
- Make sure the Controller is properly connected to the power source (LED lights will remain off with reverse polarity).
- Try resetting the circuit breaker by pushing the button back into the Controller.
- Make sure the Controller dial is turned all the way up to position 10 (turned clockwise all the way until it stops).
- Check the LED lights to see if they are indicating high or low battery voltage.
- Check the battery voltage, it must be 12.5 volts minimum: The Controller has a low voltage disconnect at 10 volts. The Controller will shut off and then turn on every few seconds (pulsate) or the water flow from the Pump will slow if the output voltage on the battery drops to 10.75 volts when in use. The Controller has a high voltage disconnect at 18 volts.
- A fast flashing red LED indicates an electrical continuity issue. Check voltage and all connections.
- Make sure the Pump is operational. The Pump can overload if the impeller is blocked with sediments.

Pump Maintenance

- The Pump can run as long as the motor is submerged and battery power is available. Running the motor dry will reduce its life. If Pump runs for very long time then the motor will not last.
- In the event of a tripped circuit breaker, turn the Controller dial to the "0" position, then press the reset button and slowly turn the dial to desired setting.
- Use the optional disposable filter to prevent sediments from entering the Pump motor.

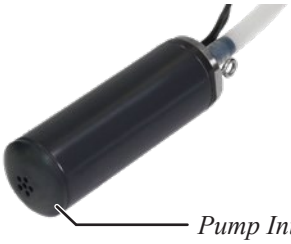
Decontamination

- To decontaminate the Pump, always follow your local guidelines and protocols.
- DO NOT fully disassemble the Pump.

1. Unscrew intake or filter from the bottom of the Pump.
2. Wash the Pump with a phosphate-free soap.
3. Rinse thoroughly with deionized water and dry.
4. Reconnect the intake or a new filter.

Filter Installation

1. Unscrew the intake from the bottom of the Pump.
2. Screw the filter into the bottom of the Pump until finger tight.



Pump Intake

LED Indicator Light Definitions	
LED	Condition
	Cycling colours: **Pump OFF**
	Solid green: **Pump ON**
	Flashing green: **Pumping at Maximum Rate**
	Slow flashing yellow: **Charge Battery**
	Fast flashing yellow: **Voltage Too High**
	Solid red: **Stop Pump. Service Required.**
	Slow flashing red: **Controller Cool-down Required**
	Fast flashing red: **Pump is Disconnected**

Slow: 1 flash per second Fast: 4 flashes per second

Note: All "Red" faults require the Controller to be turned off, wait 10 seconds, and turn it back on to clear the indicator. Exception: if the Controller is overheated, then turn the dial to near "0" but keep the unit powered to let the fan provide airflow for cooling.

Optional Disposable Filter
(#115774 100 US mesh sieve size)

800M Mini Pneumatic Packer Connection

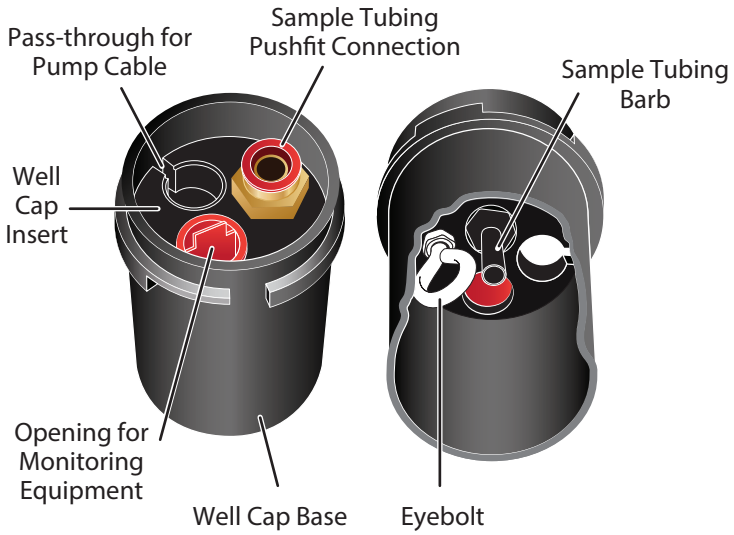
(suitable for 50 mm (2" OD) Schd 40 wells)

1. Unscrew the intake/filter from the bottom of the Pump.
2. Screw the Pump to Packer Adaptor into the bottom of the Pump until finger tight.
3. Screw the 800M Packer Assembly into the bottom of the Pump to Packer Adaptor. (See the Model 800M Assembly and Installation Instructions).
4. Lower the assembly to the desired depth.
5. Inflate the Packer Assembly as described in the 800M Assembly and Installation Instructions and operate the 12V Pump in the same manner as described on Page 1.

Pump to Packer Adaptor
(#115939)

800M Mini Single Packer Assembly
(#115931)

Sample Inlet



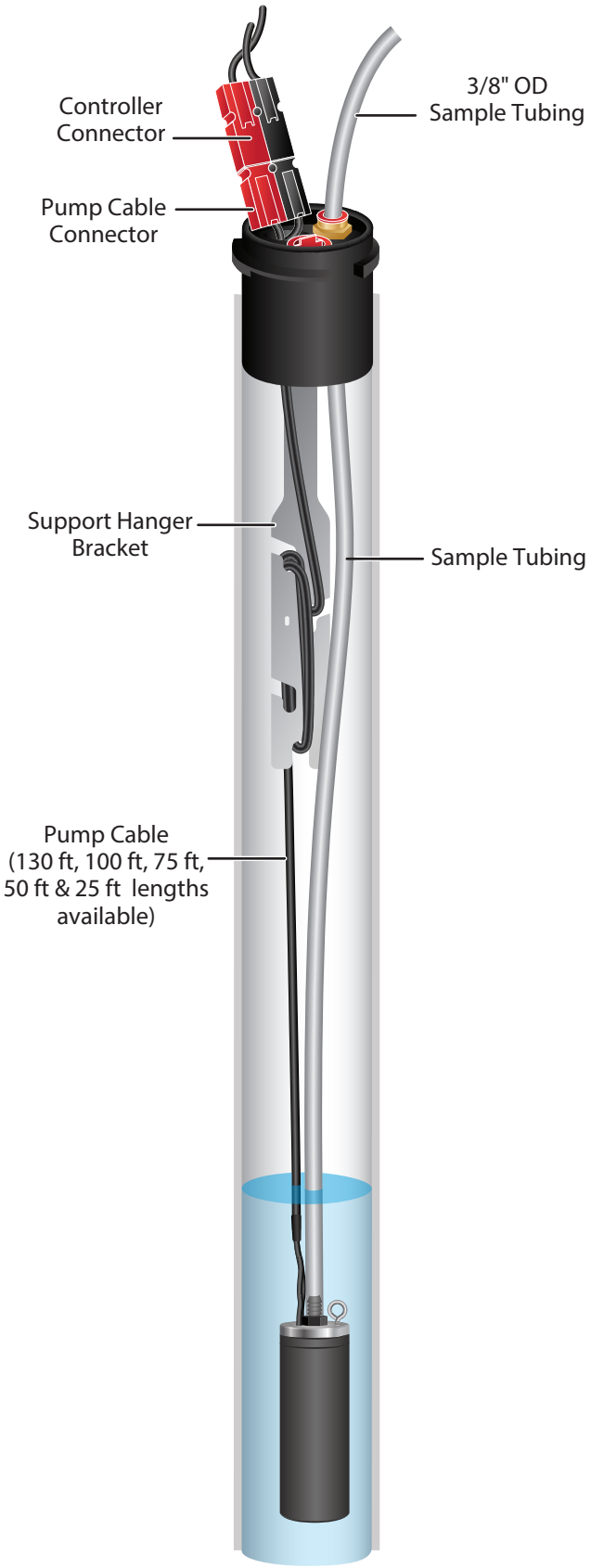
2" Dedicated Well Cap Assembly (#116244)

Includes the Well Cap Base, Cap, Insert and Support Hanger Bracket (4" Adaptor also available (#110235))

1. Wrap the top end of the Pump cable around the support hanger bracket, inserting the cable into the cutouts of the bracket to secure. Leave about 3" of slack in the Pump cable (top end has connectors for the Controller) above the top of the bracket.

> **Note:** The holes in the bracket can accommodate twist ties or zip ties to secure the cable to the bracket, if desired.

2. Just above the hanger bracket, slip the Pump cable through the pass-through in the side of the well cap insert and into the opening (tubing pushfit connection on the insert facing up). Line up the insert with the hanger bracket, to avoid twisting the cable.
3. Connect the sample tubing from the Pump to the tubing barb on the bottom of the well cap insert. Ensure the tubing is pushed all the way onto the tubing barb.
4. Slide the well cap base onto the well casing.
5. Lower the pump assembly down the well until the support hanger bracket seats on the shoulder of the well cap base.
6. Push a short length of 3/8" OD sample tubing into the pushfit connection on the top of the well cap.
7. Connect the Controller to the Pump cable connector and operate the 12V Pump in the same manner as described on Page 1.

> **Note:** While sampling, the red plug can be removed from the opening in the well cap insert to accommodate other monitoring equipment, such as a Solinst Water Level Meter or Levelogger.

8. Once finished sampling, release the sample tubing from the pushfit connection by pushing down on both sides of the top ring and pull the tubing out.
9. Secure the well cap to the well cap base. Attach an optional padlock if needed.