

**Safety Precautions.**

- When working with any form of electricity there is a potential for, and risk of injury if not treated with respect and care.
- Isolate the power (Solar Array, Genset, Grid) and/or disconnect the MC4 connectors when working on the system.
- Do not connect or disconnect any cables while under load (system running).
- Do not let water ingress in the controller, Solar connectors, DC isolator. Check all glands are sealed and tightened after installation. External component covers e.g. pressure switch covers fitted correctly.
- Be careful when assembling arrays in windy conditions. Panels can catch the wind and present a safety hazard.
- Do not run the pump dry.

**Parts included with pump systems.****Lorentz PS or PS2 System.**

- Lorentz helical rotor or centrifugal pump assembled with cable.
- Lorentz PS or PS2 Controller with mount plate.
- Isolator switch with MC4 leads, mount plate and 2 x self-tapping hex head screws.
- Earth stake and Earth cable.
- 370mm cable ties for attaching cable to pipe and securing wires on array.
- 5 x 450/550mm cable ties for attaching Pressure Switch Assembly to array pole (when PSA is included with system).
- Outlet pipe fittings on pump.

**Additional with BORE/WELL or suspended pump application.**

- Low level probe with cable.
- Either 1" Aluminium bore cap with eyelet bolt or 32/40mm BSP Borecap with inlet/outlet fittings (depends on pump size and depth please check your quote/invoice for clarification).
- Poly rope or S/S cable (S/S cable with come with S/S wire grips)

**Additional with DAM/SOAK or floating pump application.**

- **HR Pump Dam float assembly** includes. 2 x 300mm pump float, 1 x 200mm pipe float, pump saddle (attached to pump), poly riser assembly, 1 x 25m roll x 13mm LD poly pipe, 2 x 1" x 100mm end loop sleeve.
- **Centrifugal pump Dam float assembly.** 1 x 450mm pump float, 1 x 200mm pipe float, S/S riser assembly with 32mm or 40mm nipple for connection to pump, 1 x 25m roll x 13mm LD poly pipe, 2 x 100mm x 1" end loop sleeve.

*(Additional 25m LD poly roll and 200mm pipe floats may be included if pipe run into dam exceeds 35mts. If discharge pipe from dam is larger than 1 ¼" then the 200mm float will be mounted on a 1 ½" riser assembly with saddle)*

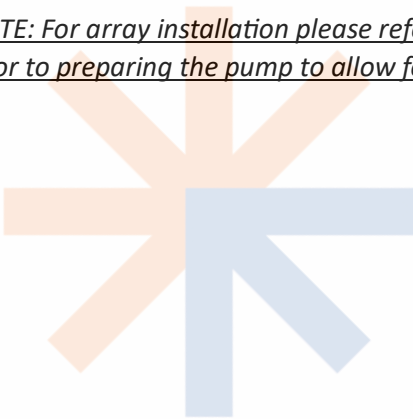
**Optional or Customised items that may be included in the kit.**

- Pressure Switch Assembly. Includes ball valve, pressure gauge, riser assembly and pressure switch with cable. Fittings as required may be included with the PSA.
- Float switch with either 10 or 20mts cable. Used for shutting off the pump when the tank is full.
- Dual acting float valve.
- Thread seal tape.
- Power Pack. AC to DC converter

**Tools or items required for controller, pump and array installation.**

- Phillips head screwdriver.
- Small flat head screwdriver.
- 6mm hex head Allen Key.
- Side cutters or similar cutting tool.
- 2 x 22mm spanners or adjustable wrenches.
- 2 x 18mm spanners or adjustable wrenches.
- 2 x 13mm spanners.
- 1 x 14mm spanner.
- 2 x Multigrips or pipe wrenches.
- Post hole or similar shovel (if hand digging hole for pole), 300mm dia. Auger, digging bar
- Spirit level,
- Stanley knife.
- Electrical tape.
- Leather or appropriate gloves and other general PPE as required.
- Multimeter.

*NOTE: For array installation please refer to the relevant guides it is recommended to install the pole prior to preparing the pump to allow for the concrete to set.*



## Preparing pump for installation.

### Bore/Well.

Pre-measure and record - Total depth, static water level and the decided depth the pump will be installed at. Installed pump depths can be determined from previous bore logs and pump depths, Drillers report, or if unknown it is acceptable to install at 0.5m - 1m up off the bottom of the bore. These measurements will also assist with **pipe and safety cable lengths**. NOTE: if unsure please contact SWP.

Measure and cut pipe to length to suit desired pump setting (take into account length of pump and height or bore casing on the surface).

There is an allowance of 5m of cable from the top of the bore to the controller (1.5mts is required from base of pole to controller).

Take care when removing the pump and controller from the box. The motor and other cables may be connected to the controller.

*For some applications and ease of install with long cable runs or limited access open the controller and disconnect the wires. NOTE: It is suggested you take a photo of the wiring prior to disconnecting wires.*

Place pump near bore, ensure threaded and compression fittings are thread taped and tight.

*\*NOTE: if hot and sunny it is recommended to cover the pump with a towel or similar to shade from direct sunlight.*

Cable tie the pump power cable to the pump and just below the pump fittings.

Attach low level probe 100-200mm above the poly fitting from the pump using the cable ties provided and position on the opposite side to where the safety cable will run past. Probe is positioned vertically (**Figure 1.0**). There are slits/holes provided at the bottom of the probe for 1 cable tie to go through. Then fit 1 around the body and 2 for the end and small cable support.

Place a cable tie just above the low level probe which also goes around the pump cable then place cable ties on edges of the pump cable heat shrink (**Figure 1.1**) and around both cables every 1.2-2.0mts while making sure cable lengths are even. Cables ties should be secure but should not pinch the cable or the pipe.

Attach s/s cable or poly rope to pump. Wire rope grips for S/S cable or D shackle for poly rope have been provided. Run safety cable along the opposite side of the pipe from the cables.

Recheck final pump depth measurement and either:

for light Aluminium bore cap 1" - Slide bore cap over pipe and tie or attached using fittings. Eyelet for the 1" cap should face down.

Attach poly rope to eyelet on 1" bore cap. Cable tie the tail of the rope as per. (**Figure 1.2**)

Stainless steel cable should be looped through the hole in bore cap and secured with a s/s rope grip. 12mm wrap has been provided. This is for wrapping the cable where it comes out of the bore to prevent it rubbing on the casing. **(Figure 1.3)**

Both rope and s/s should be of length the pump is supported by the rope or s/s cable not the poly pipe or electrical cable. NOTE: poly rope will stretch 30-50cm once the pump is in operation so make allowance for this when setting it up.

Pump and pumpset should now be ready to install into the hole. We recommend this as a two-person operation so one person can control the drop of pumpset and the other person can control the pipe/electrical cables along the ground. Leather gloves or appropriate gloves should be used during pump installation as the rope and cable can produce significant heat through friction.

Once pump is installed in bore make sure the rope/SS cable is supporting the pump. Adjust if necessary.



Solar Water  
Pumps

## Dam/Soak.

Take care when removing the pump and controller from the box. The pump cable will be connected to the controller as will the pressure switch assembly if included with the system.

Take pump to a position that will allow you to roll out the cable and prepare the pipe to be installed into the dam. The ideal distance would be the distance from the edge of the dam to the middle of the dam as this will allow you to prepare the pump and cable section that will be in the water.

**Prior to attaching the pipe to the pump slide the 200mm float(s) over the pipe near the pump end.**

For **Helical Rotor** pumps attach pipe to pump and cable tie pump cable just below the pipe fitting.

For **Centrifugal** pumps you will need to attach the S/S dam float assembly first. This can be done without the float on the riser. **(Figure 1.4)** Attach the pipe to the fitting.

Cable tie the motor cable to the pipe on either side of the heat shrink. **(Figure 1.1)**

Place the pipe float 2mt from pump outlet and place the cable over the float with a cable tie attached on either side as per **(Figure 1.5)**. *If an additional pipe float has been provided this should be place approximately 5-8mts from the first float.*

Cable ties should then be placed every 1.5-2mts along the pipe while making sure that the cable is not pulled too tight. Cables ties should be secure but should not pinch the cable or the pipe.

For **Helical Rotor** pumps attached the dam float assembly to the saddle, then attach the 300mm floats.

For **Centrifugal pumps** install the 450mm float onto the S/S dam float assembly.

Attach the 13mm LD poly pipe around the dam float assembly (also around the pump for the helical rotor) use the pieces of 1' rural pipe as a sleeve the keep the LD secure, as per **(Figure 1.6 and Figure 1.7)**.

A star picket should be positioned on the opposite side of the dam to the array prior to the pump being installed. This is where the other end of the 13mm LD pipe is attached.

Install the pump into the middle of the dam by pulling on the LD pipe while another person feeds the pipe and cable. Take care to avoid dragging the pump through mud as much as possible.

Once the pump is in position attach the 13mm LD pipe to the star picket leaving a little slack so the pump can lower if the dam level drops.



Figure 1.0



Figure 1.1



Figure 1.3



Figure 1.5



Figure 1.6



Figure 1.7

## Mounting the controller.

### Single Panel Systems.

The controller comes with a plate that is mounted onto the 18mm bolt on the South side of the array as per **Figure 2.0**

### 2-4 Panel Systems.

The controller comes with a 13mm bolt and nut on the South side of the pole top as per (**Figure 2.1**).

## Mounting the isolator.

Using the 2 x self-tapping hex head screws, mount the isolator onto a suitable position on the array frame on the West Side of the controller as per (**Figure 2.2**) The isolator should be mounted to the left of the controller on the closest available aluminium rail or gal cross beam.

## Connection to the array.

Please refer to the wiring diagram for your array. **Do not connect anything directly to the controller until the array is connected to the isolator and the isolator is in the off position. Prior to connecting the controller to the isolator check the input voltage using a multimeter.**

Voltage range should not exceed the voltage of the controller as listed below.

Model	Pump motor rated power [kW]	Affiliated pump motor	Max. DC input voltage [V]
PS2-100	0.1	EC Drive 100-AHR-S	50
PS2-150 BOOST	0.3	EC Drive 150-BOOST	55
PS2-150	0.3	EC Drive 150-AHR EC Drive 150-C	55
PS2-200	0.3	EC Drive 200-HRE EC Drive 200-C	110
PS2-600	0.7	EC Drive 600-HRE EC Drive 600-C EC Drive 600-CS-F	165
PS2-1800	1.7	EC Drive 1800-HRE EC Drive 1800-C EC Drive 1800-CS-F	200
PS2-1800 extended voltage	1.7	EC Drive 1800-HRE EC Drive 1800-C EC Drive 1800-CS-F	220
PS2-4000	4	EC Drive 4000-HRE EC Drive 4000-C EC Drive 4000-CS-F	385

Once voltage is checked. Make sure isolator and controller are in the off position and connect isolator wires to the controller.

**Pressure switch Assembly.**

After attaching your fittings to the assembly mount it at the base of pole **with the ball valve on the outlet side** using the 2 of 450/550mm x 8.0mm Cable Ties. **(Figure 2.4).**

**Earth Stake.**

Earth Stake should be hammered in to a position near the array leaving around 90-120mm exposed. Use the brass clamp and attach the loose end of the earth wire to the earth stake. **(Figure 2.5)**

Use the remaining 450/550mm cable ties to secure the cable(s) to the pole. Any extra motor or probe wire should be coiled up loosely at the base of the array and secured with a cable tie.

**PowerPack.**

If you purchased a PowerPack with your system, it will come with a set of brackets and rail. Using the brackets, mount it on the South side of the pole and wire according to the wiring diagram which can be found on the website. **(Figure 2.6).**

**Testing/Starting pump for the first time.*****Make sure controller cover is tight.***

Turn on the isolator. The controller standby light should be flashing. ***If it is not flashing this indicates there could be a wiring problem. If this occurs, please contact SWP's for more information or technical assistance.***

With the ball valve open on the outlet, flick the controller switch forward. The standby light should go solid green, then the second light will start flashing. The pump has a soft start system and will take up to 20 seconds to reach full speed. It might take a little while for water to reach the pressure switch/gauge assembly as the discharge pipe fills.

Once the pump is running at full speed it is recommended you check the pressure switch (if installed). Slowly close the ball valve on the outlet, the pressure gauge will indicate a rise in pressure. When the pressure reaches the cut off setting the pressure switch will click, the pump will then shut off. A red light will come on the controller indicating REMOTE SWITCH active. The controller is now in a 15-minute time delay. Simply turn the controller off for 3 seconds then turn back on to re-start the pump.

System is now ready. For more details and technical information consult the Lorentz controller manual.



Figure 2.1



Figure 2.2



Figure 2.3



Figure 2.4



Figure 2.5

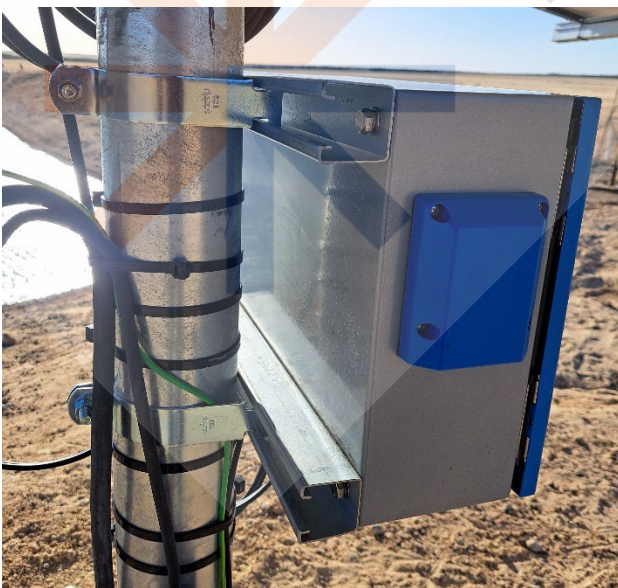


Figure 2.6