GLS User Manual

RPS Grid-less Sump Pump™

Our Pledge to You

Dear Customers,

In an effort to shape the way our company does business, our mission statement includes a series of pledges to you, our customers.

- **We pledge to give you the power!** Controlling your own ability to pump water out of the ground, whether in the field or at home, allows you to be more resilient. Freeing your water source from the grid is a major step towards self-sufficiency. You just bring the DIY spirit! Our engineers will be on the other end to offer specialized knowledge and answer questions, so you can install our solar pumps confidently and gain total control over your water supply.

- **We pledge to be a company our grandfathers would have trusted.** The all-too-common practice of outsourcing customer support after the sale is one we wholeheartedly oppose. We are an American, family-run company and our USA engineers, who will support you before and after the sale, are the best in the industry. We gain most of our business from word-of-mouth as a result of treating customers with respect and standing by our products.

- **No Pressure. Ever.** Our sales team is not on commission—we think this is important. Their role is to match you with the right pump for your well. If we don't have a pump that will suit your needs, we'll help you find a solution elsewhere. Our job is to help get you water, not sell you something that isn't a good fit.

- **We pledge to bring you reliable water!** All manufactured products have occasional issues and we can't claim to be perfect. Well water varies in pH, iron level, and sand content. With that said, we are extremely proud of our 100% track record in getting our customers water. That's right, every single one of our customers is now successfully pumping water with an RPS system. This starts with making sure we supply you with the right pump for your land, and if issues do arise, we will immediately provide technical support and replacement parts so you can get up and pumping again as quickly as possible.

Sincerely,

The RPS Family

Warning: Risk of Electric Shock

Solar panels and batteries can produce a significant amount of energy, which can cause electric shock. Please exercise caution when installing your solar well pump and follow the step-by-step instructions in this manual for your safety.

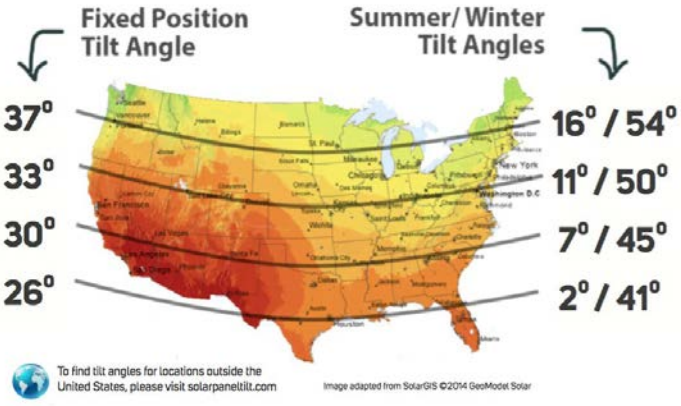
Whenever you're working with wiring or connections, make sure:
- the controller is set to OFF
- solar panels are covered
- there are no exposed wires

Be sure to ground the system for safety and to prevent damage to equipment.

Remember, safety first! RPS is not liable for damage or injuries that result from improper installation technique. If you're unsure about the safety aspects of any step in this manual, please consult an RPS Engineer.

INSTALLATION DETAILS

RPS SOLAR PANELS — Solar panels should be mounted on a secure structure, ground mount or top of pole mount. Several ideas can be found at www.RPSSolarPumps.com. Panels should face true South and at an angle appropriate for your latitude. If you are mounting your panels on an already built structure, try to get as close to the correct angle as possible.



Ensure there are no shadows or other obstructions on the solar panels. While shadowing a small corner of a single panel may not seem like a big deal, since the panels are connected in series, a small shadow can limit the power output from all other panels connected in series! This means a small shadow on a single panel could reduce system power by hundreds of watts. Time to get out that chainsaw and trim some trees!

GLS CONTROLLER — Your Controller is not waterproof and should be located in a **dry dust-free location**, protected from the sun and the elements and pests such as mice and bugs. Mice love to chew wires and spiders and moths will build nests wherever they can find room. While we understand you cannot eliminate all pests, it might be time to spray some insecticides around your shed and set some mousetraps! There is nothing worse than finding insulation chewed off your electrical wires. **The fan remains running in low power mode at under 25W at all times to protect the equipment. This fan uses very little power and it running, increases the lifetime of the system.*

GLS PUMP - Since water does expand when it freezes, care should be taken to winterize the system if being used in a climate that experiences hard freezing. The water that the pump is submerged in and the water in the outlet pipe, both should not freeze to avoid damage. Care should be taken in plumbing the intake to ensure tight connections which will avoid leaks.

BATTERIES - Unless you already bought a GLS system that included the appropriate number of RPS 55Ah 12V Deep Cycle GEL batteries, customers will need to supply their own battery bank. RPS recommends 12V GEL / AGM / sealed lead acid batteries that are designed for maintenance free operation. More common flooded deep cycle marine or RV batteries can also be used. Batteries should be stored in a dry location protected from the elements.

With the RPS Grid-less Sump Pump™ system you'll get efficient and reliable dewatering without the utility grid.

The included solar panels charge a maintenance-free battery bank, which power a brushless motor on your Grid-less Sump Pump, that slow-starts and slow-stops, extending it's lifetime and saving valuable power collected from the sun.

SYSTEM OVERVIEW

Warning: Risk of Electric Shock
Solar panels and batteries can produce a significant amount of energy, which can cause electric shock. Whenever you're working with wiring or connections, make sure:

- Solar panels are at least partially covered
- There are no exposed wires

Be sure to ground the system for safety and to prevent damage to equipment.

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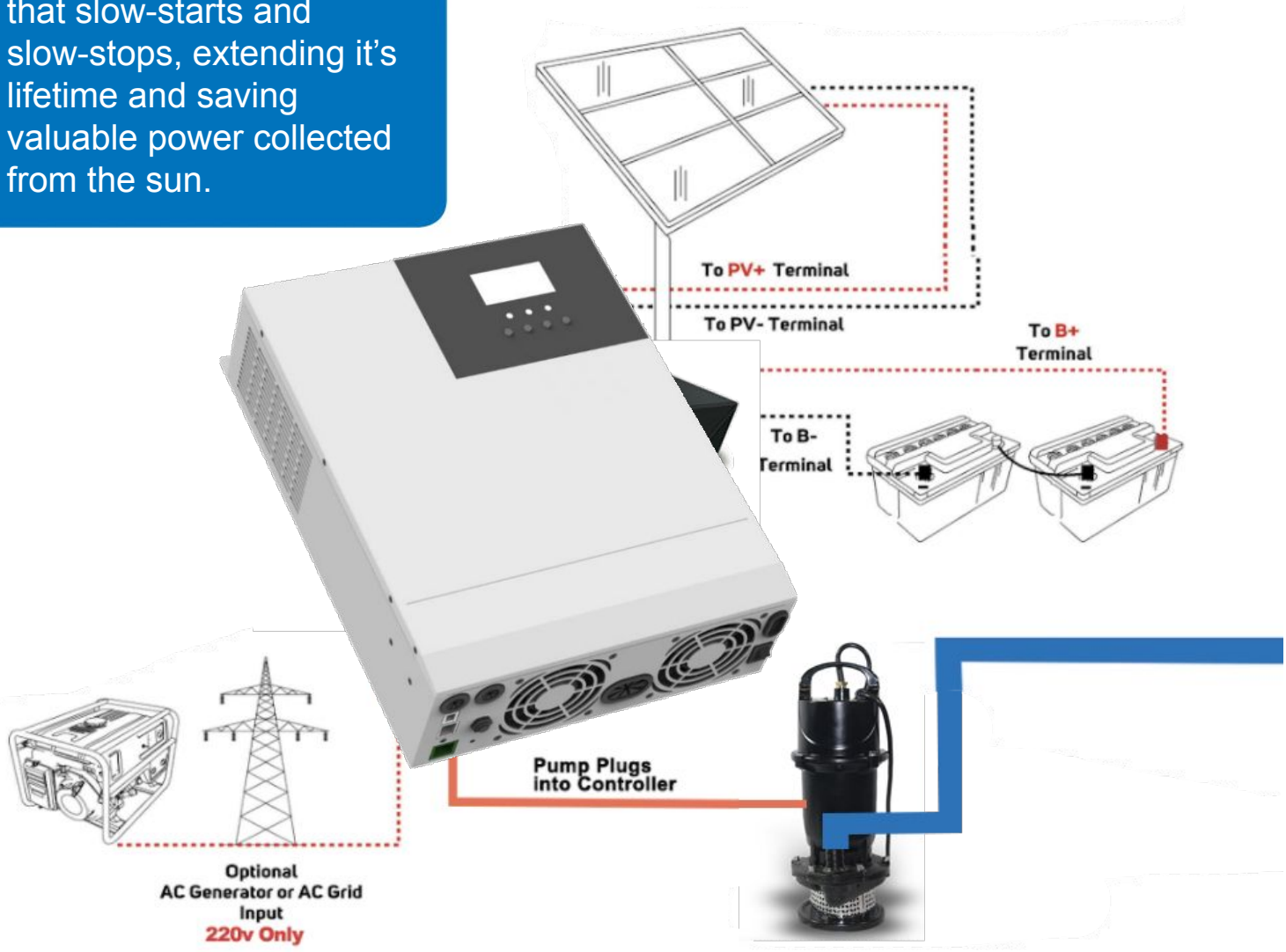
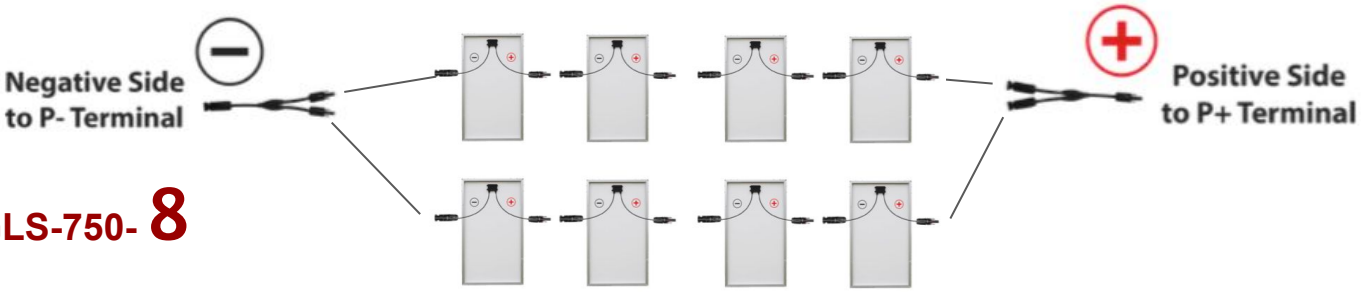


WIRING YOUR SOLAR PANELS

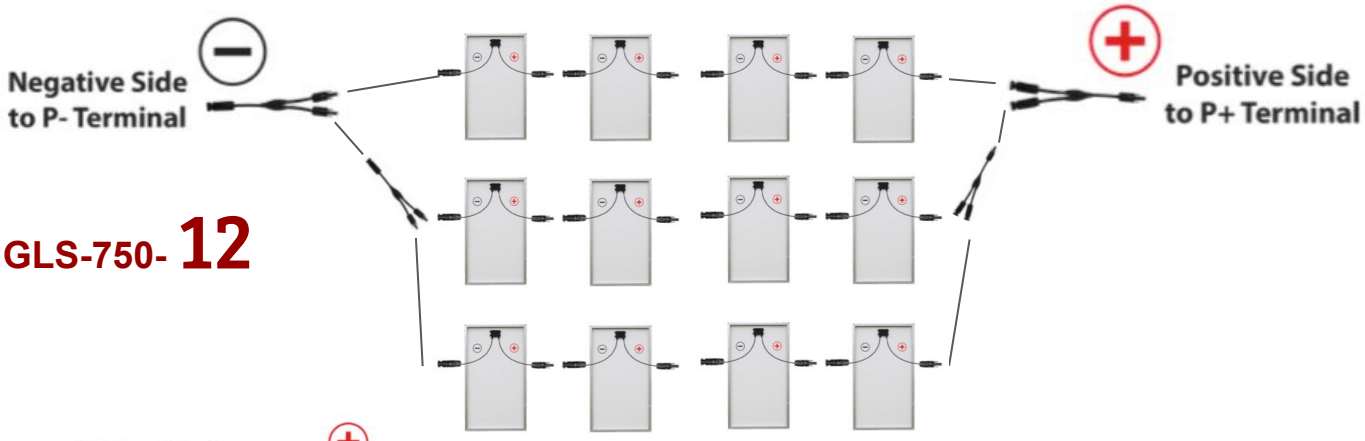
WARNING: RISK OF SHOCK! Solar panels, especially when connected in series and parallel, can produce a significant amount of energy, which can cause electric shock. Cover the solar panels with a cloth or tarp when you're working with the wires.

GLS-750- 4

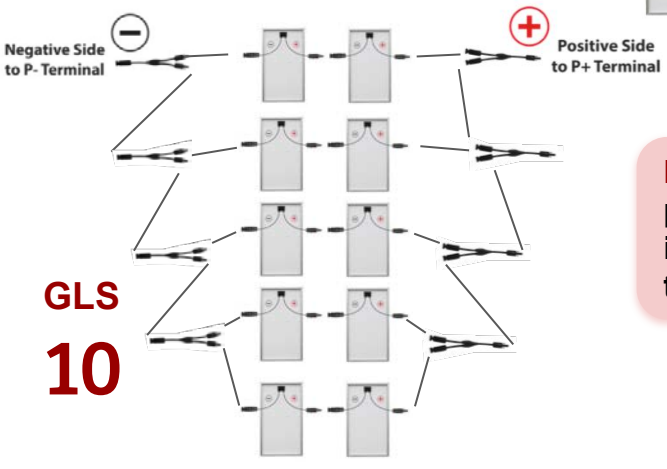
GLS-750- 8



GLS-750- 12



GLS 10

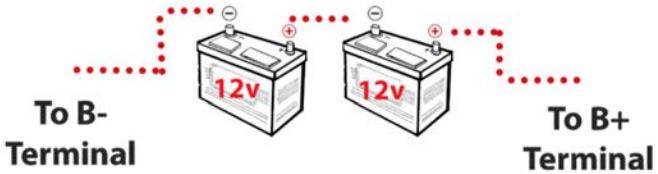
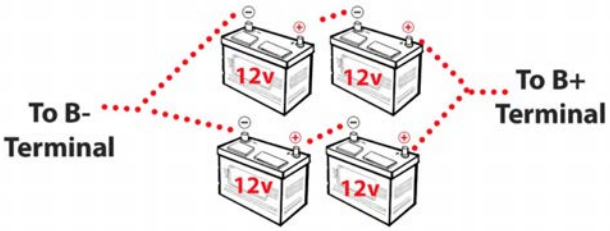


Note: If using your own solar panels do not exceed 90Voc input! Ask an RPS Engineer how to wire if you're unsure!

You will link your solar panels together and connect to the controller by clipping **MC4 connectors** together. Each MC4 connector is either a male end or female end (see image). They simply snap together to make safe and easy connections.

BATTERY WIRING 24V ONLY

RPS recommends AGM / sealed lead acid batteries that are designed for several maintenance free years of operation. They should also be stored in a dry location protected from the elements. To prevent significant voltage drop, the batteries should be located as close to the Controller as possible. Within 3 feet is ideal. If further than 3ft is required, the wires may be extended using appropriate gauge cables. The batteries operate best at room temperature and it is best to keep them out of freezing conditions for maximum performance.

2x 12v Battery Configuration Batteries Wired in **Series** Recommended 8 AWG wire	
4x 12v Battery Configuration Batteries Wired in **Series / Parallel** Recommended 8 AWG wire	

To (-) Controller

To (+) Controller

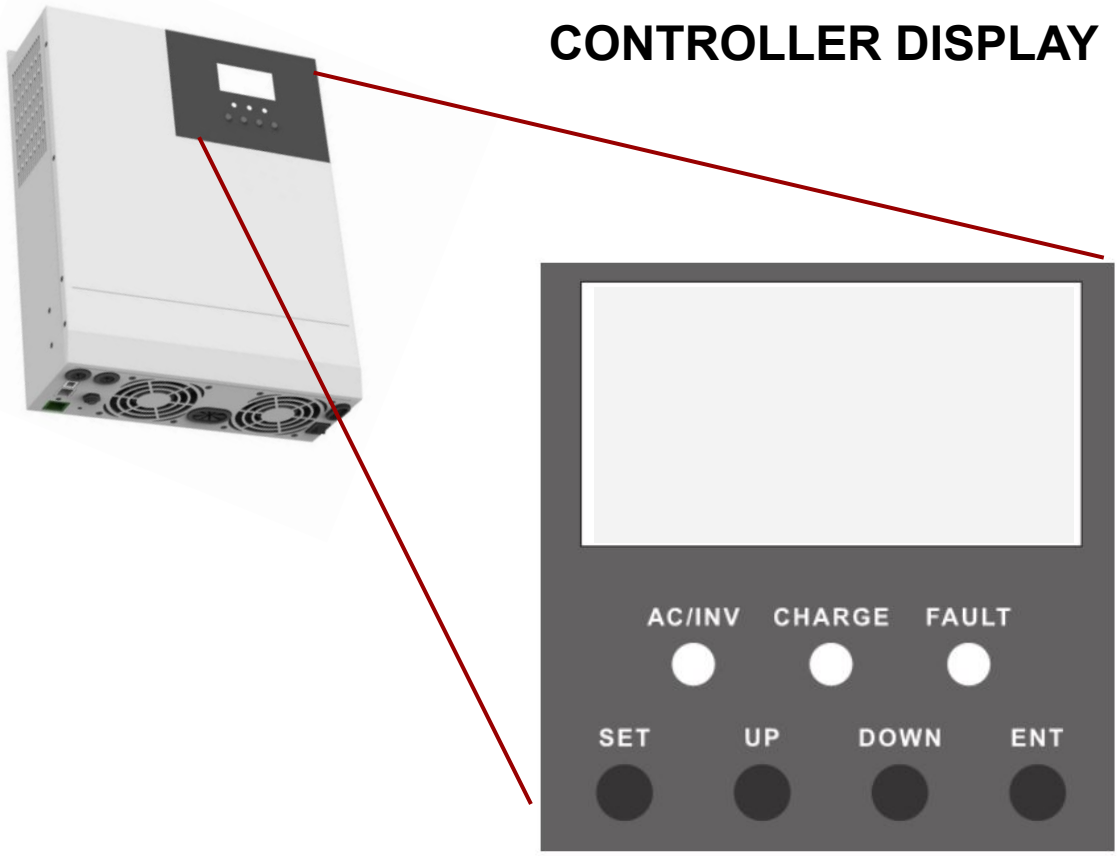
DC Breaker

12 Battery Example

6 sets of 2 batteries in parallel (12 total)

Note: Do not exceed two 12V batteries in series or four 6V batteries in series. For extra battery capacity add sets in parallel.

CONTROLLER DISPLAY



The factory settings of the TP750 controller accommodate almost every install scenario of a Tankless Pressure Pump. RPS Engineers recommend leaving them at their default settings to ensure proper operation.

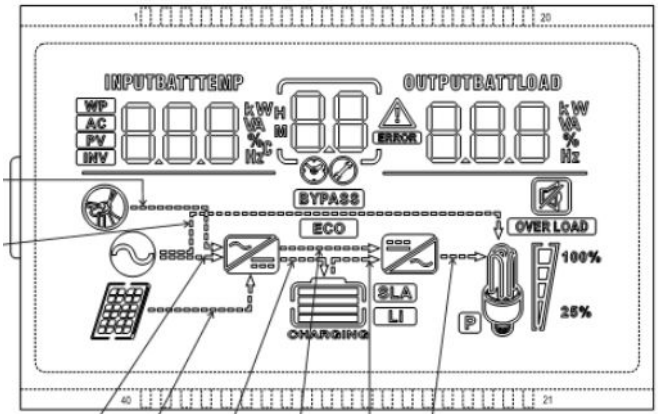
Operation buttons introduction

Function buttons	Description
SET	Enter/Exit Settings menu
UP	Previous choice
DOWN	Next choice
ENT	Confirm/Enter Options under the settings menu,

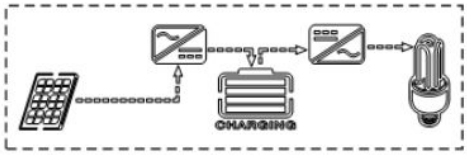
Indicators introduction

Indicators	Colors	Description
AC/INV	Yellow	Steady on: Mains output
		Flash: Inverter output
CHARGE	Green	Flash: Battery charging
		Steady on: Charging completed
FAULT	Red	Steady on: Fault state

DISPLAY DETAILS



Icons	Functions	Icons	Functions
	Indicates that the AC input terminal has been connected to the grid		Indicates that the inverter circuit is working
	Indicates that the AC input mode in APL mode (wide voltage range)	BYPASS	Indicates that the machine is in the Mains Bypass mode
	Indicates that the PV input terminal has been connected to the solar panel	OVER LOAD	Indicates that the AC output is in an overload state
	Indicates that the machine has been connected to the battery: indicates that the remaining battery is 0%~24%; indicates that the remaining battery is 25%~49%; indicates that the remaining battery is 50%~74%; indicates that the remaining battery is 75%~100%.		Indicates the percentage of AC output loads: indicates that the load percentage is 0%~24%; indicates that the load percentage is 25%~49%, indicates that the load percentage is 50%~74%, indicates that the load percentage is ≥75%.
LI	Indicates that the battery type of the machine is a lithium battery		Indicates that the buzzer is not enabled



DEFAULT
Hybrid Mode

SLA	Indicates that the current battery type of the machine is a lead-acid battery		Indicates that the machine has an alarm
CHARGING	Indicates that the battery is in charging state	ERROR	Indicates that the machine is in a fault condition
	Indicates that the AC/PV charging circuit is working		Indicates that the machine is in setup mode
	Indicates that the AC output terminal has an AC voltage output		The parameters displayed in the middle of the screen: 1. In the non-setup mode, the alarm or fault code is displayed. 2. In the setup mode, the currently set parameter item code is displayed.
Parameters display on the left side of the screen: input parameters			
AC	Indicates AC input		
PV	Indicates PV input		
INV	Indicates inverter circuit		
WP	This icon is not displayed		
	Display battery voltage, battery charge total current, mains charge power, AC input voltage, AC input frequency, PV input voltage, internal heat sink temperature, software version		
Parameters display on the right side of the screen: Output parameters			
	Indicates output voltage, output current, output active power, output apparent power, battery discharge current, software version; in setup mode, displays the set parameters under the currently set parameter item code		
Arrow display			
①	The arrow is not displayed	⑤	Indicates the charging circuit charging the battery terminal
②	Indicates the grid supplying power to the load	⑥	The arrow is not displayed
③	Indicates grid supplying power to the charging circuit	⑦	Indicates the battery terminal supplying power to the inverter circuit
④	Indicates PV module supplying power to the charging circuit	⑧	Indicates the inverter circuit supplying power to the load

220V AC INPUT (Only if Required)

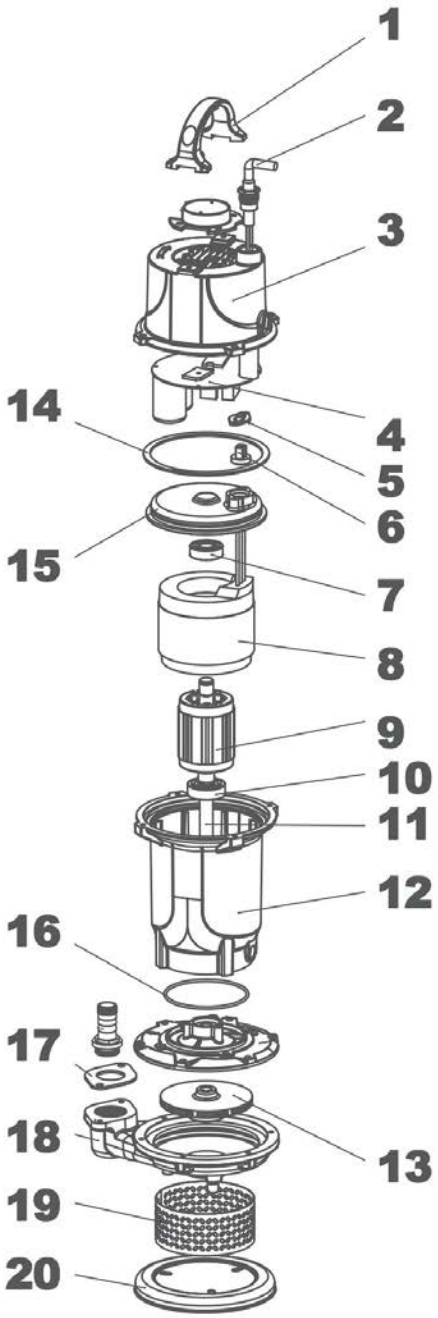
Your Controller is designed to take solar power and charge your 24v battery bank. As an optional backup, it is also setup to accept 220V AC to both charge your batteries and run your pump directly if desired. There is a 3 prong outlet and a pigtail in your kit that allows for the wiring of 220v line power connector.

Wiring 220v is only for certified professionals or those familiar with 220v power.

MOTOR & PUMP ASSEMBLY

See drawing of GLS-30 and GLS90 at right. Outlet size varies by model (#17)

1 Handle	11 Motor shaft
2 Power Cord	12 Lower Motor Housing
3 Upper Motor Housing	13 Pump Impeller
4 Internal Circuit Board	14,15 Upper Seal, Flange
5,6 Wire Gland	16 Lower Seal
7 Upper Bearing	17 Pump Outlet (Varies)
8 Motor Stator	18 Pump Impeller Housing
9 Motor Rotor	19 Screen Filter
10 Lower Bearing	20 Base



COMPATIBLE SOLAR ARRAYS

	Min ***400 Watts*** *(4x100w, 36Vmp)* *2 Strings of 2 Panels* *PWM Solar Charge Controller*	***Max*** *(Hybrid Upgrade)* ***1200 Watts*** *(12x100w, 54Vmp)* *4 Strings of 3 Panels* *MPPT Solar Charge Controller*
GLS-30	**RPS GLS-30-4**	**RPS GLS-30-12 Hybrid**
GLS-90	**RPS GLS-90-4**	**RPS GLS-90-12 Hybrid**

CONTROLLER TROUBLESHOOTING

Your Controller is **not waterproof and should be located in a dry dust-free location**, protected from the sun and the elements and pests such as mice. moths and bugs. Mice love to chew wires and spiders and moths will build nests wherever they can find room. While we understand you cannot eliminate all pests, it might be time to spray some insecticides around your shed and set some mousetraps! There is nothing worse than finding insulation chewed off your electrical wires or moths clogging the units fan.

**The fan remains running in low power mode at most times to protect the equipment. This fan uses very little power and it running, increases the lifetime of the system.*

Faults	Handling measures
No display on the screen	Check if the battery air switch or the PV air switch has been closed; if the switch is in the "ON" state; press any button on the screen to exit the screen sleep mode.
Battery overvoltage protection	Measure if the battery voltage exceeds rated, and turn off the PV array air switch and Mains air switch.
Battery undervoltage protection	Charge the battery until it returns to the low voltage disconnection recovery voltage.
Fan failure	Check if the fan is not turning or blocked by foreign object.
Heat sink over temperature protection	When the temperature of the device is cooled below the recovery temperature, normal charge and discharge control is resumed.
Bypass overload protection, inverter overload protection	① Reduce the use of power equipment; ② Restart the unit to resume load output.
Inverter short circuit protection	① Check the load connection carefully and clear the short-circuit fault points; ② Re-power up to resume load output.
PV overvoltage	Use a multimeter to check if the PV input voltage exceeds the maximum allowable input voltage rated.
Battery missed alarm	Check if the battery is not connected or if the battery circuit breaker is not closed.

VOLTAGE CHECK
Take a DC Voltage Reading of each battery. Battery voltages range from 11.5VDC (dangerously low) to 14.4VDC (fully charged) depending on the state of charge. Low voltages? Charge for 8 hours in full sun.

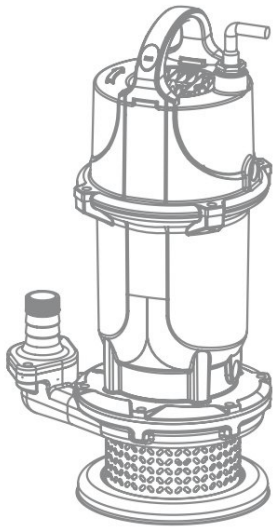
SOFT RESET
Press and Release Power Switch

HARD RESET
Disconnect Batteries and Solar Panels for 60 seconds. Reconnect.

Real-time data viewing - On the LCD main screen, press the “UP” and “DOWN” buttons to scroll through the real-time data of the controller unit.

Page	Parameters on the left side of the screen	Parameters in the middle of the screen	Parameters on the right side of the screen
1	INPUT BATT V (Battery input voltage)	Fault code	OUTPUT LOAD V (Output load voltage)
2	PV TEMP ℃ (PV charger heatsink temperature)		PV OUTPUT KW (PV output power)
3	PV INPUT V (PV input voltage)		PV OUTPUT A (PV output current)
4	INPUT BATT A (Input battery current)		OUTPUT BATT A (Battery output current)
5	INPUT BATT KW (Battery input power)		OUTPUT BATT KW (Battery output power)
6	AC INPUT Hz (AC input frequency)		AC OUTPUT LOAD Hz (AC output frequency)
7	AC INPUT V (AC input voltage)		AC OUTPUT LOAD A (AC output load current)
8	INPUT V (For maintain)		OUTPUT LOAD KVA (Load apparent power)
9	INV TEMP ℃ (AC charge or battery discharge heatsink temperature)		INV OUTPUT LOAD KW (Load active power)
10	APP software version		Bootloader software version
11	Model PV Voltage Rating		Model PV Current Rating
12	Model Battery Voltage Rating		Model Output Power Rating

PUMP TROUBLESHOOTING



No Sound From Pump	Low or no power To pump	Check Connections, Soft Reset of Controller, Check batteries for low voltage
Pump Doesn't Start	Pipe is blocked	Ensure valves are open to clear airlocks
Pump Doesn't Stop	Check for leaks, Turn down pressure	Small leaks in plumbing are the most common, check around outlet cover, Turn down pressure setting
Pump Sputters	Pump not properly primed or air entering system	Prime pump and remove all air from system, check inlet pipes for leaks, Install foot valve for suction applications

SYSTEM RESET OPTIONS

Controller Soft Reset

Turn off controller power button (display will stay on if solar panels are connected), wait 60 seconds and turn power button back on.

Controller Hard Reset

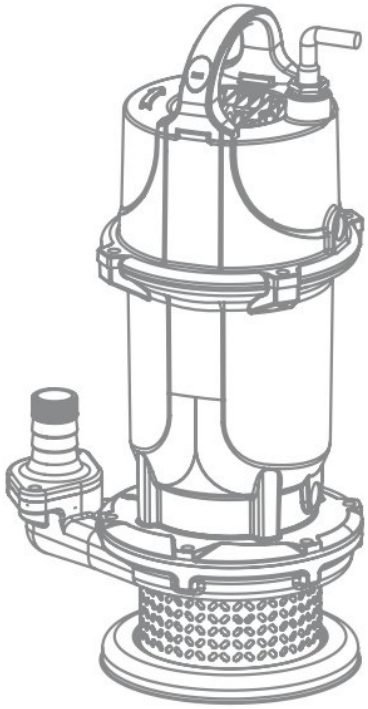
Disconnect solar panels and batteries. Wait 60 seconds, connect batteries, then solar panels.

Pump Hard Reset

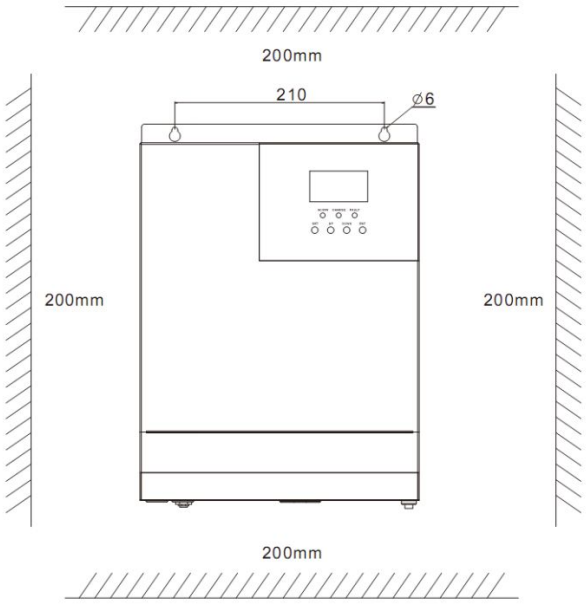
Unplug pump, wait 60 seconds, plug pump back in.

PUMP DIMENSIONS

Submersion Depth	2’ to 15’ (15’ Max)
Outlet (GLS 30 / 90)	1" / 2”
Acceptable pH	6.5 - 8.5, Water (No Fuel)
Temp. Range	0 - 40°C, 32 - 104°F
Max. Solids Size	With Filter 0.25”
Motor Type	Permanent Magnet (BLDC)
Power Range	700 - 1280w (Variable)
TDH (GLS 30 / 90)	90’ / 115’
Max Current	5.8A @ 220V
Weight	30lbs, 13.6kg
Height / Diameter	18" / 9”
Speed	3500 - 5500 RPM (Variable)



CONTROLLER DIMENSIONS



Compatible Pump	GLS, TP-750 Only
Battery Voltage	24 VDC Only
Battery Wiring	8AWG or Thicker
Dimensions	15in x 11in x 4in 378mm x 280mm x 103mm
Temp. Range	0 - 40°C, 32 - 104°F
OPTIONAL AC INPUT (See 220v Wiring)	220 VAC Only
Weight	7.8lbs
Recommended Clearance	Mount with 8 inches of space in all directions

SUPPORT

Need additional help getting your system running?

If you're having issues getting your system pumping, please check out our YouTube channel! We have videos on each section of the setup including Wiring, Plumbing, Battery config, Well Seals and more!

For detailed videos on troubleshooting, visit:
RPSsolarpumps.com/help

youtube.com/rpssolarpumps

Contact an Engineer

At RPS, we're commited to making sure you get water when you need it. Our engineers are standing by to help with any issues. Give us a call or text at:

888-637-4493

Visit Us On YouTube

WARRANTY

Rural Power Systems Inc extends to the original consumer purchaser a limited warranty against defects in material and workmanship for a period of twelve months from the date of purchase.

This warranty covers the pump, controller, and solar panels. Rural Power Systems Inc will repair or replace any defective part or parts of the product free of charge within the first twelve months of purchase. In the event of a malfunction, the purchaser must return the product to receive a replacement.

The warranty is limited to the repair or replacement of the product. Rural Power Systems Inc disclaims all liability for indirect and/or consequential damages, such as any installation charges, damage to mounting structures/ buildings, or loss of revenue.

The warranty does not apply when the equipment has not been installed according to the instructions or damage has occurred through abuse, carelessness, improper installation, accident of mishandling during shipment, or connecting to an improper voltage.

Your warranty is linked to your product’s serial number which is on record at Rural Power Systems Inc. All repairs not covered by warranty or outside the warranty period are charged at normal rates.

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NOTES:

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RPS Solar Pumps
40250 County Rd 27
Woodland CA 95776

888-637-4493
Call or Text