

## API Economy Kit– H & C Series Pump System

### Features

- High efficiency 3 phase stainless steel BLDC motor and thrust bearing system.
- Microcast AISI 304 stainless steel centrifugal wet end includes multistage impellers with rigid motor coupling. (C Series)
- Microcast AISI 304 stainless steel helical rotor wet end adopts special wear-resistant rubber and hardened rotary shaft for increased wear resistance and service life. (H Series)
- Pump heads are field serviceable/replaceable
- External motor controller with built in MPPT tracking, power fusing and speed adjustment.
- Digital readout displays voltage, current, wattage, speed, and error reporting.
- Dry run protection
- Over/under-load protection
- Over/under-voltage protection
- Lost phase and stall protection
- Can be used with most switch types (float, pressure switch, etc.)
- Vertical or horizontal installation up to 90°
- Up to 150 feet of static lift (H series) 70 feet (C series)
- 2-Year manufacturer warranty on motor and controls
- 25-Year linear output warranty for solar modules

### System limits

#### -.3HP/24v

- Vmp: 20-40 VDC
- Max VOC: 48 VDC
- Max current: 15A
- 1 x 300w solar module (minimum wattage)

#### -.5HP/48v

- Vmp: 40-76 VDC
- Max VOC: 96 VDC
- Max current: 15A
- 2 x 300w solar modules (minimum wattage)

## Panel Installation

1. Dig a post hole for the appropriate size of system being installed.
2. Pole depth should be roughly  $\frac{1}{2}$  the height of the total length of the pole with the hole diameter being 3 times the pole diameter. For example, a 10-foot 2-7/8-inch pole will require a hole with a bury depth of 3-6 feet, with no more than 6 foot above ground surface, and a minimum diameter of ~9 inches. Soil conditions change from region to region and will determine actual depth and diameter of the hole and amount of concrete that will be used. Please consult a local civil engineer to determine soil conditions for your specific location.
3. Fill the bottom with 3-5 inches of gravel to allow for water drainage.
4. Install the mounting pole so it rests on the bottom of the hole.
5. Brace the pole and level so that it sits plumb and fill the hole with concrete.
6. Allow the concrete to set for a minimum of 24 hours before installation, some locations may take longer depending on moisture content.
7. Install panel and mount assembly on top of the pole, facing south for the northern hemisphere, or facing north for the southern hemisphere. Please check local conditions for panel angle. Typically, most of the US will face south between 30-45° (API mounts will come fixed at 45°).
8. Tighten set bolts and pipe clamp.

## Pump Installation

1. Ensure all power is **OFF** before installing.
2. Lay out wiring, piping, and fittings that will be used to install the system.
3. Install pipe fitting and check valve (optional) in line with pump head.
4. Attach black roll /PVC pipe to pump head and secure with hose clamps or glue.
5. Install shrink tubing and splice 12-3 submersible pump wire to the motor leads from the pump using the provided heat shrink butt connectors. Wiring combination is **RED** to **BLUE**, **BLACK** to **BLACK**, **YELLOW** to **BROWN**, **GREEN** to **GREEN**
6. Use a torch or heat source to melt butt connectors and wait to cool.
7. Slide the shrink tubing over the connectors and heat.
8. Set the low water sensor that is provided (helical rotor) a minimum of 6 inches above the pump head.
9. Affix the pump wiring and low water sensor lead to the pipe approximately every 6 feet, leaving some slack in the wires to prevent stretching.
10. Install wiring and pipe using a well seal with a drop pipe, well cap, pit-less adapter, or conduit.
11. Remove the cover of the pump controller and install the pump leads and water sensor(s) through the strain relief glands, paying attention to the wiring schematic. **DO NOT OVERTIGHTEN TERMINALS.**
12. **RED** to W, **BLACK** to U, **YELLOW** to V, **GREEN** to GROUND (CENTRIFUGAL)
13. Install the low water sensor using WEL and COM.
14. 3 wire floats and switches will use TL, TH, and COM.
15. 2 wire floats and switches will use TL and TH with a jumper wire between TL and COM.
16. Tighten strain relief glands and turn on the DC disconnect switch or press the power button to start.

Scan the QR code below for detailed instructions or visit [www.solarpumps.com/installation](http://www.solarpumps.com/installation) for more information.



## Recommended Tools

- Appropriate personal protective equipment
- Post hole digger or powered auger
- Adjustable pliers
- Electrical and PTFE thread sealing tape
- Screwdriver: Phillips and standard
- Electrical wire cutters and crimper
- Water bucket
- Quickset concrete
- PVC cutter
- Box level
- Torch or heat source for shrink tubing
- Tape measure
- Ratchet and sockets: 3/8 – 9/16
- Wrenches: Fixed or adjustable

\*The above tools and equipment are highly recommended to have available to assist with installation but are in no way a comprehensive list of tools that can ease installation. Installers feel free to substitute comparable equipment where appropriate.

## Alarms and Fault Codes

- P50 - Low voltage: Voltage is below requirements
- P51 - High voltage: Voltage exceeds requirements
- P48 - Dry Protection: Water shortage in well, WWL "closed"
- P0 – Hardware over-current: Short circuit of cable or terminal between motor and controller, motor and controller model mismatch
- P43 – Phase missing protection: Phase loss of controller, wiring between motor and controller is loose, cable is damaged and needs replaced, motor may be damaged (check resistance between two UVW, excess of 15% deviation not allowed), dry run or too small of current load, insulation is crimped instead of wire
- P49 – Software over current: Short circuit of cable or terminal between motor and controller, motor and controller mismatch
- P46 – Stall Protection: Pump is blocked or jammed, check pump and motor connection, motor bearing damage, motor and controller mismatch
- P60 – Controller high temperature: Keep adequate ventilation and heat dissipation near controller
- PL – Low power: Input power too low, pump is blocked
- E8 – PCB component failure: PCB damaged, must be returned to factory
- Beep alarm: Reverse polarity: Ensure positive and negative connections are correct

\* Error reporting of 2 times continuous "P48": automatic recovery after 30 minutes

\*Error reporting of 5 times continuous "PL": automatic recovery after 30 minutes

\*The automatic recovery time of other faults is 30s after the fault is cleared.

## Note

- Maximum sediment content of water source shall not exceed 120g/m<sup>3</sup> for centrifugal pumps, helical rotor shall be installed in clean water only. Debris wear is not covered under warranty.
- The pump must be fully submerged in water, otherwise damage can occur. Test the pump in an appropriately sized container before installing.
- The pump shall keep a certain distance from the bottom of the well to prevent the unit pumping debris or burying and damaging the unit. The minimum recommended distance is 8 feet.
- The low water sensor supplied with the helical unit shall be installed a minimum of 6 inches from the top of the pump to prevent dry running.
- Ground rods are recommended to help dissipate lightning strikes.
- Check valves are recommended to prevent water hammer in the pipeline.
- Ensure proper pipeline drainage and protection if in an area where freezing occurs to prevent damage.
- The controller is IP65 rated, however it is recommended that the unit is not installed in direct sunlight. Please install the controller in a shaded area such as behind the solar modules, or a room with good heat dissipation.
- The furthest installation distance between the controller and the motor is 350 feet. For long distance installations, the gauge of wire shall be increased for the required specifications.
- When UVW wiring sequence is incorrect, the motor may rotate in reverse causing decreased or no flow rate. The helical rotor pump may be damaged if wired incorrectly. Please install the wiring connections accordingly.
- It is the responsibility of the installer to ensure project information is accurate and all installation procedures adhere to city, state, and local ordinances and codes.
- Flow rates are estimates based on a 60c 315w mono-crystalline module. Flow totals will be dependent on amount of solar energy available, geographical location, and time of year.

## Warning

- The power supply from DC sources such as solar panels can cause **SERIOUS HARM** or **DEATH** if handled incorrectly, use appropriate safety procedures when working on any system components.
- Always assume components are live and use qualified personnel when making electrical connections.
- **DO NOT EXCEED** maximum VOC. Excessive voltage will cause irreparable damage to the controller and will void all warranty. Each unit from API is sized according to the motor and controller specifications. Please see listed power requirements or call a sales technician at 866-519-7892 to assist you.

- API is not responsible for injuries or damages caused by incorrect installation or mishandling of system components.

