



KEDRON[®]

W A T E R S Y S T E M S

www.kedronproducts.com

Motor: 3SP-1.5HP **SN:** XXXXXXXXXX

VDC: 60-360 Vmp / 400VOC **IDC:** 10A

VAC: 1 PH 90-240V **IAC:** 10A

RPM: 500-4000 S1 40-C / 104°F

I.C.L. F IPX8

Weight: 6 kg / 13 Lbs 160m / 524FT

ISO9001-2015



Made In China

Built In Controller

The **Kedron® Water Systems 3SP1-20P** hybrid AC/DC 3” submersible deep well pump is constructed using SS304 Stainless Steel and integrated power controller. Designed specifically for ease of installation and employing advanced soft-start technology, this TUV Certified pump utilizes a 2-wire (2 wires + ground) connection which can accommodate a wide range of electrical input configurations. Simply connect the pump wiring as instructed, and the internal controller will manage the rest automatically.

Example power input configurations:

- **120 VAC single phase** – this would be the most common AC connection voltage, used for residential or industrial applications with a conventional pressure switch and pressure tank. It also allows for the use of small to mid-sized solar power systems employing lower wattage inverters. Smaller gas, propane, or diesel-powered generators with a standard 15A outlet can also be connected.
- **90 - 240 VAC single phase** – this pump will also accommodate a wide range of AC input voltage connections for non-typical commercial or industrial applications. Please note this model does not support split phase 120/240 VAC.
- **PV Direct DC** – with an operating range of 60-360 VDC, connecting solar panels directly to the pump will allow the built-in controller to turn on the pump during sunny days when the minimum power is available to start, and turn off once the voltage drops (i.e. sunset). An optional external timer, controller, or float switch can also be added to control the pump start/stop function. This is ideal for automatic farm irrigation, animal watering, cistern filling, and other agricultural, commercial, and industrial applications. Please follow the instructions included in this manual for proper solar panel installation.

Specifications

- TUV Certified
- Model Number: 3SP1-20P
- Type: Centrifugal with thrust bearing system
- Pipe Connection: 1-1/4" NPT
- Minimum borehole diameter: 3 inches (76mm)
- Construction: IP68 stainless-steel enclosure / brushless permanent-magnet motor
- Rated at 17 GPM (64 LPM) with a Total Dynamic Head of 525FT (160M) maximum
- Pump End Stages: 3 Stages
- 1.5 HP Brushless Motor
- Simple 2-wire (2 wires + ground) electrical connection and built-in controller
- 1.5 HP, single phase, 60Hz, 3-stage motor
- Voltage: 90 to 240 VAC / 60 to 360 VDC
- Wiring: 2-Wire (2 wires + Ground) / Single Phase / 60 Hz
- Amp Draw: 10 A Max
- Built-in check valve*
- Multistage Soft-start technology
- Axial Thrust: 1500N
- Recommended water temperature: 33F to 104F (+1C to 40C)
- 2-Year Warranty

Although this pump incorporates an internal check valve, it is recommended to install an inline check valve for every 230FT (70M) of vertical height of the water line to prevent water hammering.

Protections

- Reverse polarity protection
- Overload protection
- Over voltage protection
- Low voltage protection
- Stall protection
- Run dry protection*

*If the pump is without water for more than 10 seconds, Run Dry Protection engages and will turn off the pump for 1 minute before attempting to pump again. If unsuccessful on the next attempt, the pump will disengage for 30 minutes and then repeat this cycle until sufficient water supply is available.

Wiring

The following parameters in the chart below are calculated based on power loss not exceeding 8%, and voltage drop not exceeding 5%

Cable Specification AWG / mm2				
#14 / 2.5	#12 / 4	#10 / 6	#8 / 10	#6 / 16
Maximum allowable cable length FT / Meters				
270ft / 82	425ft / 130	640ft / 196	1000ft / 305	

Alternating Current (AC) connecting to 90-240 VAC single phase:



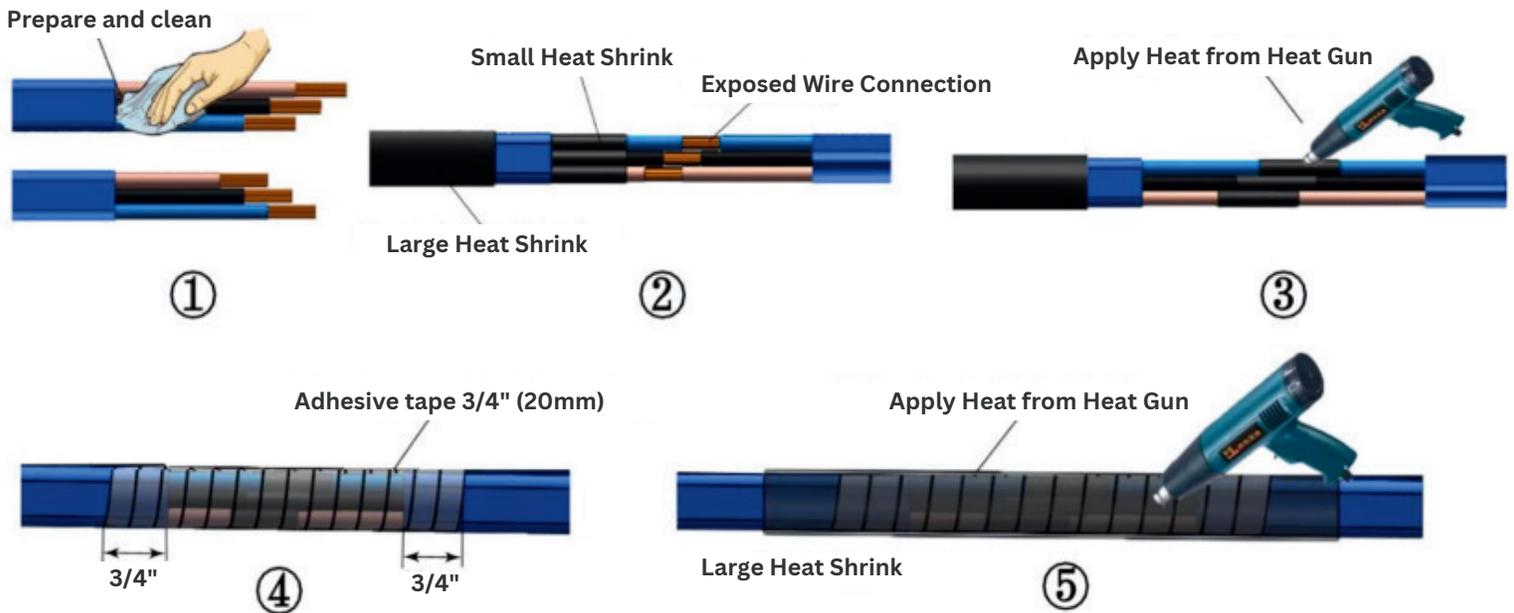
*Reminder: Split-phase
120/240 VAC is not
supported!*



- **Brown = Neutral**
- **Black = Hot / Line 1**
- **Yellow/Green = Ground**



Newly drilled wells must allow sufficient time for the well water to settle before installation, or the drilling company sufficiently bails the well before use. **NEVER** use this pump to bail a new bore. Newly drilled wells will contain water that is high in sediment, and these act as abrasives that will cause premature wear of the impeller or complete failure. Warranty is voided if the pump is determined to have been used for new well bailing, or has been pumping water that contains sediment.



1. Prepare the pump wiring and submersible extension cable wiring by trimming back the primary cable insulation and wire insulation as shown and clean all surfaces.
2. Slide the large section of heat shrink over one end of the cable, then the smaller sections over each wire. Connect the wires together using crimp connectors.
3. Slide the heat shrink over the exposed wiring, and using a heat gun, shrink the tubing until completely sealed (be careful not to overheat or you risk damaging the tubing).
4. Using the included adhesive waterproof tape, tape over top of the wires as shown by overlapping the tape with each wrap. Be sure to extend the tape at least $\frac{3}{4}$ " (20mm) over the original wire casing on each side.
5. Slide the large section of heat shrink over the taped section of wires, and using a heat gun apply heat evenly until complete.

General Installation Guidelines

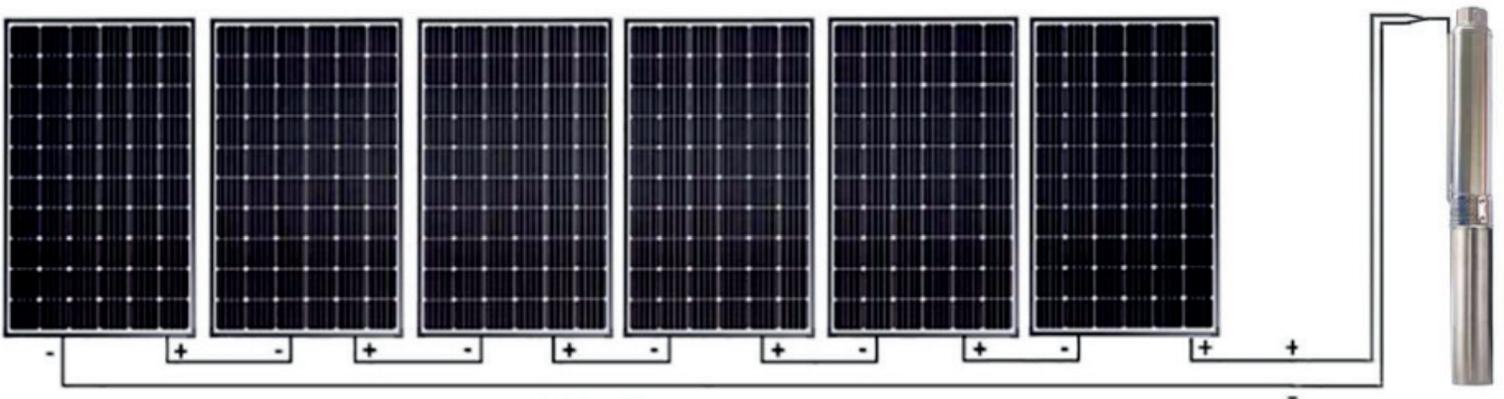
- Do not use the wiring to carry the weight of the pump or bear any tension. The cable should be in a relaxed state after installation.
- Submersed pump wiring should be taped together at 10FT (3M) intervals using the supplied waterproof tape with some slack remaining between each interval.
- A torque arrestor is recommended to be installed 18" - 24" (0.4M – 0.6M) above the pump to prevent potential wear and tear when starting / stopping.



Solar Array Installation (for direct-PV DC connections only)

Warning

- The power supply from any high-voltage DC power source such as solar panels can cause **SERIOUS HARM** or **DEATH** from electrocution.
- Incorrect installation may also damage the water pump or other connected equipment and void warranty. Always consult with a solar installation professional to assist with the design and installation of a solar PV power system to operate this pump.



The above image is a basic example of a typical pump installation powered exclusively by solar panels that are wired in series. The number and final configuration of panels required will depend on the electrical specifications of the panels used. Additional equipment will be required including breakers, surge protection, disconnects, etc to ensure safe operation and code compliance. Please consult with your local qualified installation professional who can provide this equipment based on site specific requirements.



Panel combinations must NOT exceed the input limits shown in these instructions. Exceeding these limits will not only void warranty, but may cause serious harm or irreparable damage to the pump motor or controller.

Glossary of Electrical Terms

1. V_{mp} = Voltage at Maximum Power
2. V_{oc} = Voltage Open Circuit
3. I_{mp} = Current at Maximum Power
4. I_{sc} = Current Short-Circuit

DC Voltage Specifications for the 3SP1-20P

1. P_1 (Total Input Power) = 1800W
2. P_2 (Total Motor Power) = 1500W
3. V_{mp} = 60-360V / V_{oc} = 400V (maximum)
4. I_{mp} = 10A (maximum)

DO NOT EXCEED THE MAXIMUM INPUT VALUES ABOVE!

The Kedron® Water Systems 3SP1-20P utilizes an advanced controller that can accommodate a variety of DC power input configurations. The maximum Input Power is 1800 Watt, with 10A being the maximum current accepted, so a combination of solar panels wired in series to achieve this will provide the best results. Installers need to account for the potential of increased voltage in cold temperatures and other environmental factors.



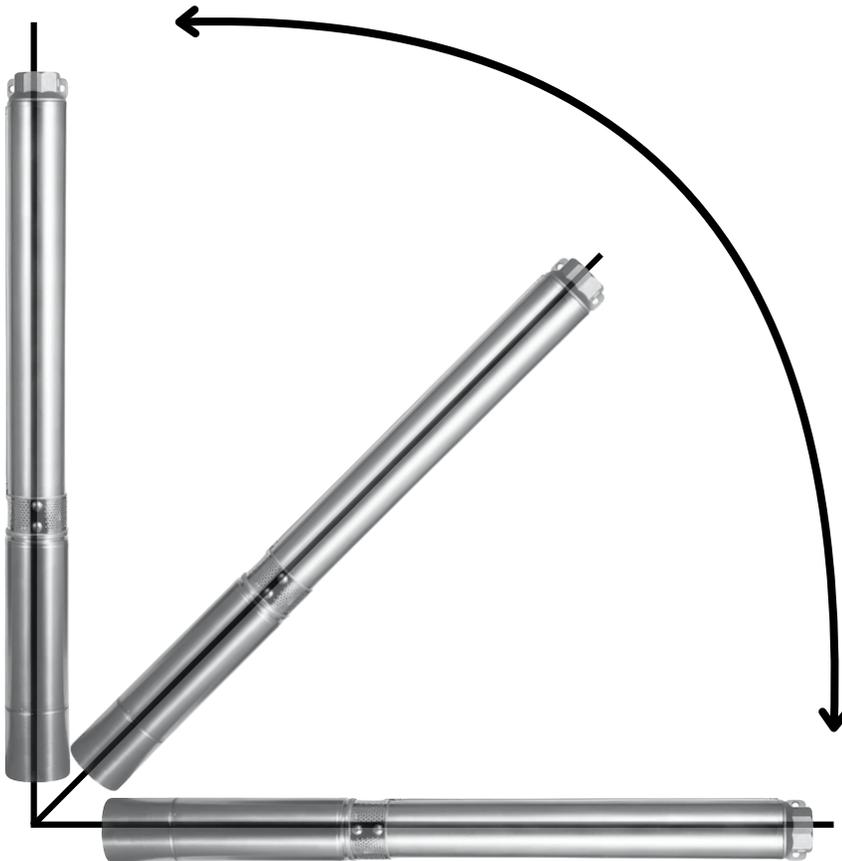
- **Brown = Positive (+)**
- **Black = Negative (-)**
- **Yellow/Green = Ground**

Heat Dissipation Requirements

While the 3SP1-20P is primarily designed for deep well installations, it can also be used for a variety of other applications including river or lake water extraction up to a 90° angle. For all installation positions, the pump must be fully submerged with minimum water flow across the motor surface of 1.6 ft/s (0.5m/s).

The installer must prevent sand or silt from entering the pump, and take precautions to ensure the pump does not make contact with the well bottom, riverbed, or lake bottom.

- In a deep well, the pump should be installed a minimum of 5FT (1.5m) from the bottom of the bore.
- In open water, such as a river or lake, the pump should have a clearance of 3FT (1m) from the riverbed or lake bottom.
- Allowable installation angle of the pump is 0-90°. NEVER EXCEED 90° or damage can occur.
- **Not approved for salt water use.**



Warranty Information

LIMITED WARRANTY

Products manufactured by KEDRON® Water Systems are warranted to be free of defects in material and workmanship for a period of 24 months from the date of installation, but not more than 30 months from date of manufacture.

Liability under this warranty shall be limited to repairing or replacing at the discretion of KEDRON® Water Systems, without charge, F.O.B. warehouse or authorized service center, any will not be liable for any costs of removal, installation, transportation, or any other charges which may arise in connection with a warranty claim.

KEDRON® Water Systems will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair, or if the product was not installed in accordance with this installation manual and operating instructions.

To obtain service under this warranty, the defective product must be returned to the distributor or dealer from which it was purchased together with proof of purchase and installation date, failure date, and supporting installation data. Unless otherwise provided, the distributor or dealer will contact KEDRON® Water Systems for instructions. Any defective product to be returned must be sent freight prepaid, and documentation supporting the warranty claim and/or a Return Material Authorization (RMA) must be included if so instructed.

KEDRON® WATER SYSTEMS WILL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES, OR EXPENSES ARISING FROM INSTALLATION, USE OR ANY OTHER CAUSES. THERE ARE NO EXPRESS OR IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH EXTEND BEYOND THOSE WARRANTIES DESCRIBED OR REFERRED TO ABOVE.