Waterra 1 UP Peristaltic Sampling Pump – Operating Manual

Waterra Pumps Limited
www.waterra.com
Made in Canada

– Operating Manual -

Waterra 1 UP Peristaltic Sampling Pump

The Waterra 1 UP Peristaltic Sampling Pump is a rugged piece of field equipment designed to draw water from shallow depths of up to 27 feet (8.3 m) using suction lift. This portable unit is ideal for sampling groundwater and surface water. The peristaltic tubing required for operation and the down well tubing are sold separately.

The pump can be powered using any of the following sources:

- 110 Volts AC power
- 220 Volts AC power
- 12 Volts external DC power (e.g., car battery)
- Internal 12V DC battery (when properly charged)
- A 10-foot (3 m) cable with alligator clips and a compatible connector for the 1 UP pump's panel is included.

You can find the serial number of this unit on the inside of the handle frame (opposite the pump head side) and inside the unit, specifically on the battery holder. Additionally, there is an extra serial number sticker attached to the lid.

Safety First!

Please read and obey all warning labels.

1 UP Pumps should only be serviced by a qualified technician.

BEWARE OF ELECTRIAL SHOCKS
The unit is an electrical device so exercise care and respect for electricity when around and using this unit. Electrical shocks can injure and in some cases be fatal. The unit was designed to be water resistant which does NOT mean waterproof. Do not immerse the unit. Water and electricity are a dangerous combination, and this unit contains a battery which should **NEVER** get wet.

- **Plugs must match the outlet.**
- **Never modify the plugs in any way.**
- **Never use the cords for carrying, pulling, or unplugging.**
- **Keep cord away from heat, sharp edges, or moving parts.**
- **Use a Ground Fault Circuit Interrupter (GFCI) to reduce the risk of electrical shock.**

DROPPING HAZARD
The 1 UP Pump could cause a serious injury if dropped. Boots with safety toes are recommended.

PINCHING HAZARD – Rotating equipment / Pinch Point
The quick-change pump head is comprised of three roller wheels rotating in a confined space. This pump head is where the peristaltic tubing is inserted so there exists the potential for having fingers, hair, or loose garments caught in the rollers. Make sure the unit is turned off when inserting the peristaltic tubing and that loose garments and long hair are safely out of range of the pump head.

Never move the pump while it is operating. Turn it off first.

BATTERY

NEVER allow the battery to get wet!
Do not leave unit near a heat source such a heater or open fire.
Do not strike the battery forcefully and/or with sharp objects.
Only use the built-in Waterra charging circuit to charge the battery.
Do not use the battery for any other application than its intended purpose inside the UP pump.
Do not open or remove the battery covering or tamper with the battery in any way.
Do not connect the battery to an electrical outlet.

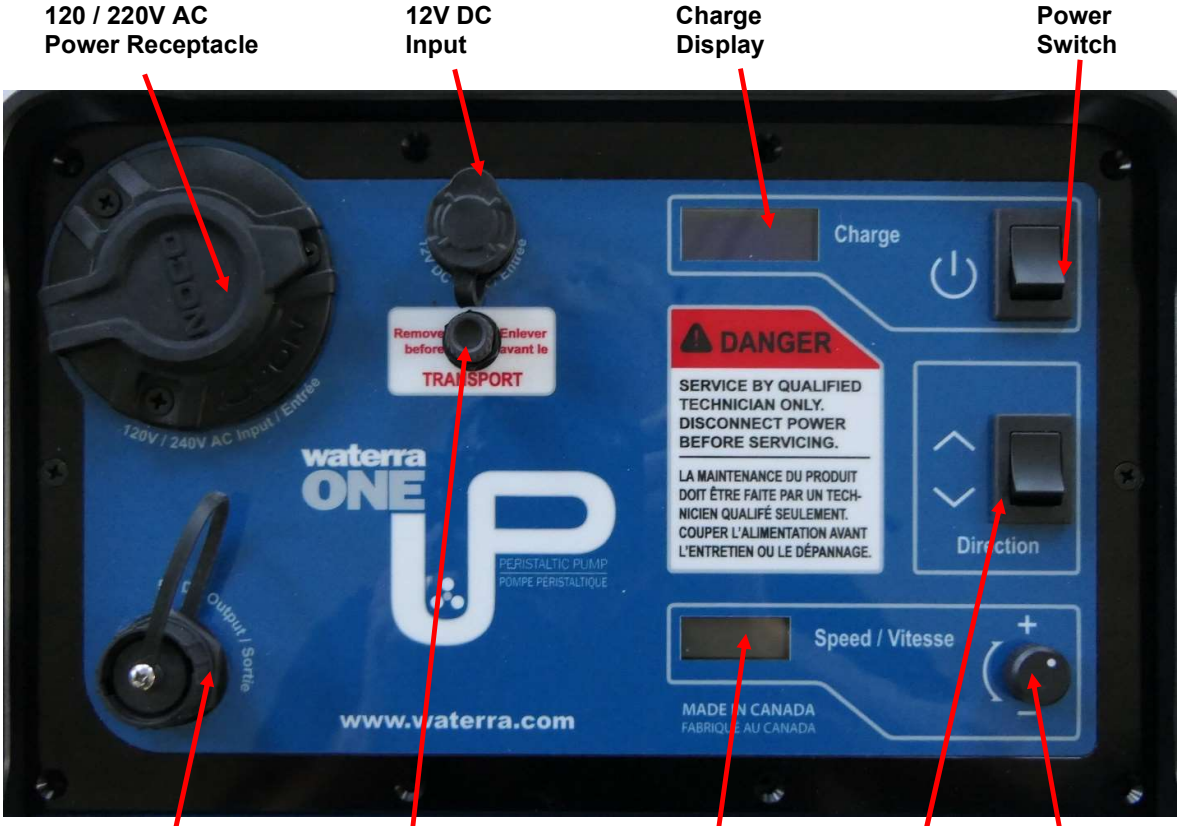
Never throw a used battery into a fire or water.

Do not operate the pump if the battery is damaged or if liquid is leaking from the pump.
Avoid contact with any leaking fluids from battery as these may cause irritation or burns - seek medical help if you do come in contact with these fluids.

Always remove the transport fuse to disconnect the battery before shipping. This disconnects the battery, so the unit does not accidently turn on during transport.

Before you ship the 1 UP pump, we **strongly recommend** removing the transport fuse (5 mm x 20 mm - 10 Amp fuse) and placing it in a small baggie. The baggie containing the fuse can then be stored in the AC power inlet – make sure the rubber cap is securely closed with the baggie and fuse inside.

CONTROL PANEL



POWER INPUTS

The control panel has 2 **external power inputs** being:

AC POWER RECEPTACLE

110 / 220 Volt AC Power Receptacle. Use a 3 contact female end of a power cord for the AC input. Supplying AC power to the unit will automatically start recharging the battery.

12VDC INPUT

A 10 foot (3 m) 12V DC input cable is provided which has a mating female plug for the 12 V input on the panel. Do not try to wire directly into the receptacle – use the plug on the cable. Alligator clips on the other end of the cable are used to connect to an external battery eg. a vehicle battery. This external source is provided as a backup in case the internal battery is drawn down. The external 12 V source does not recharge the internal battery. Only AC power is used to charge the internal battery.

CHARGE DISPLAY

The LCD display indicates "charging" when connected to power, while also showing "draining" and estimating the remaining pump usage time at a specific power level (e.g., 8 hours). To get this estimate, turn on the pump with tubing and set the speed knob to 100%. This time estimate is based on the current power usage. When fully charged, the LCD screen will read "100%" to confirm the battery is fully replenished.

> **Please note:** the charge display does not function accurately after the battery has been disconnected (for example during shipping when the fuse is removed) until
> 1) it is fully charged,
> 2) goes through a discharge period e.g., during use and
> 3) through a full charge the second time.

This occurs because the internal circuitry needs time to understand the unique charging characteristics of each battery.

For optimal battery lifespan, it's recommended to avoid frequent full discharges.

If an overcurrent fault occurs or if the pump head is obstructed or not in motion, the letter "E" will appear on the screen. To resolve this error, clear any blockages, power off the unit, and then power it on again to reset the error message. If the error message persists, please contact Waterra's technical support and repair team for assistance.

POWER SWITCH

The rocker switch turns the pump ON or OFF.

DIRECTION SWITCH

The direction switch has the function of changing the pump head's rotation direction. This feature enables the operator to position the pump optimally in relation to the well or water body to be sampled. It's important for the tubing on the intake side to create suction. If not, lower the speed control to its minimum and then reverse the pump head's direction by pressing the rocker switch downward on the opposite side.

Please note that altering the direction while the pump is operational can result in an electrical surge that might stress or potentially damage the motor and electronics. It's advisable to significantly reduce the pump speed or, even better, turn the pump off entirely before changing directions.

SPEED CONTROL

The speed control knob rotates clockwise from 0 to 100%. Please note, these are not rpms nor does using the same percentage from one session to another mean that the pump head is rotating at the same speed. Tubing type, tubing wear, water flow and depth to water can all affect pump head speed. Your best parameter to monitor is actual flow if trying to duplicate sampling protocol. Timing the filling of a measured vessel or using a flowmeter are methods to consider for measuring flow.

Please note that it may be necessary to “dial up” the speed to overcome inertia but then one can “dial down” to the desired flow rate once flow is established.

SPEED DISPLAY
Displays speed of pump head on a 0 to 100% basis

REMOVABLE TRANSPORT FUSE (Compliance with IATA Regulations)
For international air travel with Lithium-ion battery units, it is a requirement by the International Air Transport Association (IATA) that the transport fuse must be removed. This ensures proper disconnection of the battery during transit. To adhere to this regulation, we strongly advise taking the following steps: Remove the fuse and place it securely in a small plastic bag. Then, insert the bagged fuse into the AC power receptacle. Be sure to close the rubber lid firmly to keep the fuse safely stored within the cavity for the duration of transport.

USB PORT
The USB port is for charging cell phones or other small devices. It is not used to charge the 1UP Pump internal battery. The USB port has 5 V - 1000 ma output.

BATTERY CHARGING INSTRUCTIONS

The Waterra UP is equipped with a rechargeable battery pack, which can be either a sealed lead-acid (SLA) or a lithium iron phosphate (LIFE) battery. You can determine the battery type in the unit by referring to the specification label on the exterior of the 1 UP pump.

To charge the unit, switch it off and simply connect a 110V or 220V AC power source into the power receptacle on the panel. The charge display screen will illuminate, showing "charging" to confirm a solid connection.

Charging a 20 Amp-hour battery pack takes approximately 8 hours with an AC power source, while a 12 Amp-hour battery pack requires about 5 hours. Once the battery is fully charged, the charge display screen will indicate "100%" and the unit will disconnect from the external power source.

Please note: the charge display does not function accurately after the battery has been disconnected (for example during shipping when the fuse is removed) until
1) it is fully charged,
2) goes through a discharge period e.g., during use and
3) through a full charge the second time.

This occurs because the internal circuitry needs time to understand the unique charging characteristics of each battery.

For optimal battery lifespan, it's recommended to avoid frequent full discharges.

The USB port is NOT a charging port for the battery. The USB is only to be used to charge external small electronic devices e.g., a cell phone. It has a 5 V – 1000 ma output.

OPERATING PROCEDURE

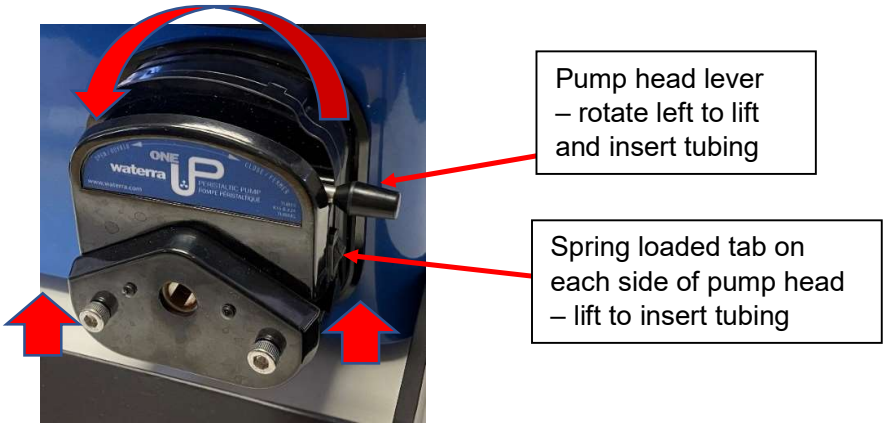
Before heading to the field, ensure the battery is fully charged. Alternatively, the 1 UP Pump can operate using a 12V DC input from a vehicle battery using the provided 10-foot (3 m) cable, or it can be powered from either 110V or 220V AC input if available on-site.

Position the pump in a level, dry area near the water source or well head for setup.

LOAD TUBING
Use specific peristaltic tubing designed for the pump head. This tubing creates the squeezing action that generates suction to draw up the water column. The unit is compatible only with Waterra UP#15-Silicone and Waterra UP#24-Silicone peristaltic tubing.

DO NOT attempt to use any tubing other than peristaltic tubing in the pump head, as this could result in motor and pump head damage.

1) Lay the unit on dry stable surface and rotate the lever on the pump head fully Counter clockwise (top to the left). This opens the pump head to accept new tubing.



2) Choose a 30 – 45 cm (12 -18 inches) length of peristaltic tubing: waterra UP#15-Silicone or waterra UP#24-Silicone (sold separately)
3) Lay the tubing over the gap in the pump head and fit the tubing into the gap on one side by pulling up the spring-loaded tab (red arrow) on that side. The spring is quite stiff. Once the tubing is in - release the tab.
4) Fit the tubing in the other side of the pump head by pulling up on the tab (red arrow) on that side and release the tab after the tubing is fitted in to position.
5) Rotate the lever on the pump head fully Clockwise (top to the right) to squeeze down on the tubing.
6) Place the pump in pumping position with the control panel horizontal and facing up.
7) Fit a piece of Waterra Nano LDPE or HDPE tubing (sold separately) into the well or water body to be sampled and fit the “up hole” end of the Nano tubing into the peristaltic tubing. The fit in #15 Peristaltic Tubing is excellent but you will need a gear clamp if you are fitting Waterra Nano tubing into #24 Peristaltic Tubing to prevent suction losses.
8) If the Peristaltic Tubing is not long enough to reach your sample vessel, fit another piece of Waterra Nano tubing into the discharge side.

START PUMPING

1) Turn the pump speed control to zero i.e. all the way counter-clockwise.
2) If you are using an external power source (110 / 220 VAC or 12 VDC) plug it in. If not, the unit will run off the internal battery to the extent it is charged.
3) Turn on the pump and dial the speed control to the desired flow rate.
4) Remember, it takes a little time for the water column to be “sucked up” the tubing.
5) The flow direction can be reversed if the pump is not pulling in the correct direction. A simple test is to feel whether air is being pushed out from the intended discharge side. If not, then the pump head direction can be reversed in the following manner:
    - Turn the speed control all the way to zero or better turn off the unit.
    - Push the other side of the direction switch down to reverse motor direction
    - Turn the speed back up to the desired level.

SPECIFICATIONS

Model Number	**UP-Pump -SLA-12**	**UP-Pump -SLA-20**	**UP-Pump -LIFE-12**	**UP-Pump -LIFE-20**
Battery type	Sealed Lead Acid	Sealed Lead Acid	Lithium Iron Phosphate	Lithium Iron Phosphate
Battery Capacity	12 Amp Hours	20 Amp Hours	12 Amp Hours	20 Amp Hours
Charging time	5 hours	8 hours	5 hours	8 hours
Field run time	5 hours	8 hours	7 hours	12 hours
Weight	22 lbs / 10 kg	27 lbs / 12.4 kg	18 lbs / 8.2 kg	20.6 lbs / 9.4 kg

SIZE: Approximately: 41 cm x 31 cm x 18 cm (16 in x 13 in x 8 in)

FUSES: This device is equipped with 5 fuses:

1. Removable Transport Fuse – 5 x 20 mm 10 Amp – external control panel
2. AC input - 2 Amp in-line fuse - 5 x 20 mm 10 Amp - internal
3. Battery input and 12 VDC input - 4 Amp Resettable – internal control board
4. Motor input – 5 Amp Resettable – internal on circuit board
5. USB output – 4 Amp Resettable – internal on circuit board

MOTOR: 12 V DC motor

SHIPPING and TRANSPORT INSTRUCTIONS

The Waterra 1 UP Peristaltic Pump contains a battery which may require some special handling and labelling when shipping, especially via air. The battery type is indicated on the specification label on the side of the pump closest to the pump head.

The unit has a removable Transport fuse on the pump panel which when removed disconnects the battery. We recommend removing the fuse, putting it in a baggie and placing into the AC power receptacle. Be sure to close the rubber lid to keep the fuse in the cavity for transport.

Protect your 1 UP Pump with shock absorbing materials. It is important to consult with your courier before shipping a Waterra 1UP Peristaltic Pump to understand and comply with their guidelines. Waterra provides a durable field equipment hard case with internal foam padding. For additional information, please visit our website. www.waterra.com

WARRANTY

Waterra Pumps Limited warranties this product for failures due to manufacturer's workmanship or material defect for 12 months from the date of purchase (or delivery, whichever is later) by the user. In the event of any failure during this warranty period, simply return the unit to Waterra. At our discretion, Waterra will either repair or replace this product, free of charge.

The warranty is void if the product has been abused, misused, or repairs have been attempted by unauthorized persons. If Waterra determines that a failure is the result of misuse etc., then an estimate for repair will be provided to the customer.

Warranty (Rental Equipment)
The warranty for equipment used as Rental equipment is 90 days. The same conditions apply to this rental equipment warranty.

This warranty described above is exclusive, non-transferable, and in lieu of all other warranties, express or implied, including but not limited to any implied warranty of fitness for a particular purpose and all warranties arising from the course of dealing or usage of trade. The buyer's sole exclusive remedy is for repair or replacement of the non-conforming product. In no event shall Waterra Pumps Limited be liable to the buyer, or any person, for any special, indirect, incidental or consequential damages whether the claims are based in contract, tort (including negligence) or otherwise in respect to or arising out of the product purchased. The extent of liability is a full refund of the purchase price upon the return of the non-conforming unit.

REPAIRS AND SERVICE

Waterra requires that we be contacted prior to sending equipment for repairs. **Please check our website to make sure the following addresses are still current. Please remove the transport fuse.** After we receive the equipment, we will provide a quotation for the repair.

All returned equipment must be decontaminated prior to returning to Waterra. Any equipment received considered hazardous will be returned to the customer at their expense.

Canada and International	USA Only
Waterra Pumps Limited #17 - 5200 Dixie Road Mississauga, Ontario Canada L4W 1E4	**Waterra USA Inc** 36 Ranch Creek Road Peshastin, WA, 98847
Phone: (905)238-5242	**Phone:** (360)738-3366
Email: Sales@waterra.com	**Email:** waterra@openaccess.org
www.waterra.com	**www.waterra.com**