



Operations Manual

TankPro TP250 Mineral Spa Sanitation Unit



A Guide to Spa Maintenance

**This Operations Manual contains information relating to the
TankPro TP250 Mineral Spa Sanitation Unit..**

The TankPro TP250 Mineral Spa Sanitation Unit is made up of two components.

- 1. The TankPro TP-250 Power Pack**
- 2. The TankPro TP-50 Cell**

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1: ESSENTIALS FOR A HEALTHY SPA

There are three fundamental requirements for maintaining a spa.

1. Filtration
2. Chlorination
3. pH

A Spa should be looked at daily to check that the water is clean and clear and the finest details of the spa walls can be seen. This will indicate whether the spa has had enough filtration and sanitation for the load conditions that were applicable the day before. Any other condition requires testing and rectification before bathing in the spa.

(a) Filtration

It is first necessary to pass water through a filter to remove debris. A standard sized pump with normal filter pressures will pump about 10,000 liters (2,642 Gallons) an hour, so a large 5000 liter (1,321 gal) spa would require about 60 – 180 minutes of filtration each day, however, about 65% only of the actual water and debris will have passed through the filter.

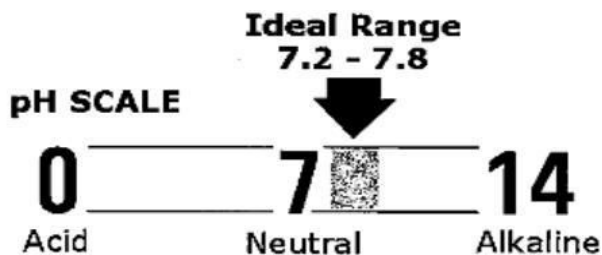
(b) Sanitation / Chlorination

The TankPro TP250 Mineral Spa Sanitation Unit takes care of the chlorination / sanitation requirements. As very mild mineral enriched water surrounds the TankPro cell, it is converted, by electrolysis, into chlorine as sodium hypochlorite.

In filtered water, chlorine is required to react with any remaining debris (both visible and non visible), remove stains by oxidation and to sterilize the water of harmful bacteria. A chlorine residual (or reserve) is required for any imminent bather load. **A chlorine residual of 1 - 3 ppm** is recommended to keep the water sterile. Longer filtration cycles can reduce the chlorine requirement and conversely, more chlorine can reduce the filtration requirement.

(c) pH

pH refers to the acid/alkaline balance of the water. pH 14 is alkaline, 0 is acid and 7 is neutral. Within the pH range of 7.2 to 7.8, chlorine will work most effectively as a bleach and sterilizer and the precipitates formed will be at their maximum size and easily picked up by the filter.



At pH 8.0 – chlorine is only 21% effective.

At pH greater than 8.0 the water is alkaline, which can cause skin rashes and calcium combines with carbonates to form scale.

At pH below 7.0 monochloramines are formed and will sting sensitive skin and eyes.

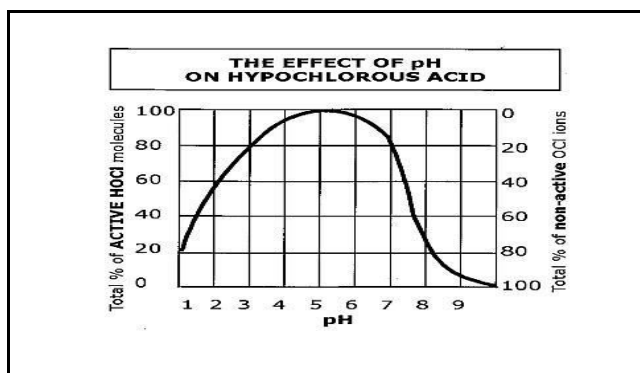
Total Alkalinity is a measure of the alkaline chemicals in the water such as bicarbonates and carbonates. It affects the speed and ease of pH change. If the total alkalinity is too high, keeping the pH in the desired range is most difficult. Most spas have an inert surface (e.g. fibreglass). Inert surfaces have a naturally occurring total alkalinity of 80 – 100pm, which is ideal for achieving correct pH.

2. THE CHEMISTRY INVOLVED

The TankPro cell, by electrolysis produces sodium hypochlorite (NaOCl). In water, sodium hypochlorite dissociates into sodium (Na^+) and hypochlorite (OCl^-) ions. It is the hypochlorite ions that form with the hydrogen (H^+) ions to form hypochlorous acid (HOCl), the active agent that destroys bacteria and algae and oxidizes organic matter.

HOCL & the Importance of pH

The chart (right) shows the effect of pH on the reversing reaction of HOCL (hypochlorous acid) in water. It can be seen that HOCL is more effective as a sterilizing agent at pH levels below 7. However, for bathing conditions it is recommended that the pH be kept with the range of 7.2 – 7.8.



3. INSTALLATION

The Tankpro TP250 Mineral Spa Sanitation Unit may be installed by the spa owner, however these instructions should be fully understood to ensure correct installation and safe operation.

Incorrect installation may pose a danger and/or damage the unit, voiding warranty. If there is any doubt then an experienced spa technician and or electrician should read these instructions & install the unit.

(a) TankPro Power Pack Installation.

The TankPro TP-250 Power Pack should be mounted in a position that complies with local electrical regulations. (A qualified licensed electrician may be needed to determine a suitable location). If the unit needs to be hardwired to mains supply or a suitable plug be attached to the power input cable, a qualified electrician should be contacted and engaged to do this job.

Locate a suitable position for the TankPro TP-250 Power Pack with the following points in mind...

The TankPro TP-250 Power Pack should be affixed to a wall within 1 (one) meter / 3 feet, of an electrical input power source. (or allowable within distance of TankPro input cable length. An extension cable should not be used.

The TankPro TP-250 Power pack should be installed against a flat vertical wall.

The TankPro TP-250 Power Pack may be connected to a power supply input voltage source ranging from 90VAC ~ 250VAC.

The TankPro TP-250 Power Pack should ideally be located undercover (in shade) or enclosed within a splash proof housing unit, away from stored chemicals (such as acid and chlorine).

The TankPro TP-250 Power Pack has an IP64 electrical rating for indoor and outdoor installations. It may be mounted directly outside, exposed to weather elements.

The TankPro TP-250 power pack has not been designed or approved to be immersed in water. Any attempt to do so will void warranty and pose a serious electrical hazard.

DO NOT immerse the TankPro TP-250 Power Pack into any water.

Using the supplied installation screws, mount the TankPro TP-250 Power Pack to a flat, vertical surface with the Power Pack in a horizontal position (label and electrical approvals at front)

If mounting against a brick or concrete wall, wall plugs should be used (not supplied).

(b) TankPro TP-50 Cell Installation.

Before the TankPro TP-50 Cell is immersed into the spa water and power activated to the TankPro TP-250 Power Pack, ensure that the required minerals or salt is added to the spa and is completely dissolved.

The TankPro TP-50 cell will come prepackaged, connected (clipped together) to the TankPro TP-250 power pack.

In some circumstances such as TankPro cell replacement, the cell may need to be connected or disconnected from the TankPro power pack.

For instructions on connecting and disconnection of the Tankpro TP-50 cell from the TankPro TP-250 power pack please refer to the section below, headed:

Connection & Disconnection of the TankPro TP-50 cell to the TP250 Power Pack.

To install the TankPro TP-50 Cell, simply immerse the cell into the spa water ensuring the cell is fully submerged into the water.

Once the cell is immersed into the water and power is applied to the TankPro Power pack the TP-50 cell will start to generate 100% available chlorine for the spa water.

(c) Adding Salt / Minerals to the Spa

The volume of the spa will determine how much Minerals or Salt to add.

TankPro recommends a salt concentration of 1000 ppm (parts per million) to be maintained for use with the TankPro TPS-50 Spa Chlorinator.

This will ensure a long productive life of the TankPro cell and also to your existing spa equipment (pumps, filter, heaters etc). The TankPro Mineral Spa Sanitation unit operator should be aware that:

Higher salt levels and warmer spa water temperatures will result in the TankPro unit producing more chlorine.

Lower salt levels and cooler spa water temperatures will result in the TankPro unit producing less chlorine.

If there is no salt / minerals in the water, then the amount of salt or minerals required is worked out by the following calculation:

Salt / Minerals Required (in Kg) = Spa Size (in liters) x 0.001 or

Salt / Minerals Required (in lbs) = Spa size (in gallons) x 0.001 x 8.3453

For a Spa that already has salt in it, calculate:

**Salt / Minerals Required = Desired Salt Mineral Level
minus Salt / Mineral Level already in Spa.**

IMPORTANT

**The salt or mineral level in the spa should never exceed 3000 ppm.
Exceeding this level may damage the TankPro Spa Chlorinator, voiding warranty.
Exceeding this level may also cause premature failure of spa equipment.**

**If the chlorinator has already been installed, it should be turned off while salts
or minerals are dissolving.**

Add the required salt or mineral blend mix directly into the spa and run the filter and pump simultaneously (while the TankPro spa chlorinator is OFF) to circulate the water and dissolve the mineral blend or salts.

DO NOT add salts, minerals or chemicals directly to any skimmer as this may damage other spa equipment.

DO NOT throw the salt / mineral bag(s) into the spa as chemicals and inks on the bag can interfere with the water balance.

A good quality mineral blend mix or salt (with low levels of iron and other impurities) should be used. Finer grades dissolve faster. **Added Minerals or Salt may take many hours to dissolve.**

(d) Connection & Disconnection of the TankPro TP-50 cell to the TP250 Power Pack.

Important: Please ensure the TP-250 power pack is disconnected / power turned OFF from any power source before connecting or disconnecting the cell.

To Connect - Using the locking clip attached on the cell connector, push forward into the power pack connector and ensure the two are locked together.

To Disconnect – Unlock the locking clip on the cell connector and pull apart.



4. OPERATION / RUNNING

While the Tankpro unit is in operation and producing 100% available chlorine, NO bathers should be in the spa.

When bathers enter or use the Spa the TankPro unit should be switched OFF or disconnected from the mains power.

The Tankpro TP-50 cell should be taken out of the water and placed into a small plastic bucket by the side of the spa until all bathers have finished and left the spa.

The TP-50 cell should then be replaced back into the spa and the power to the TP-250 power pack Turned / Switched back ON.

It is recommended to run the pump and chlorinator immediately after all bathers have finished and left the spa until a desired chlorine reading in the spa is achieved.

Testing the spa water for a desired chlorine reading of between 1-3 ppm should be done with a Chlorine Test Kit / Chlorine Test Strips. available from all pool & spa shops.



5. CHLORINE PRODUCTION

The TankPro Spa chlorinator is capable of producing a maximum of 5 grams / hour or 0.15 ounces / hour of 100% available chlorine. Chlorine production is dependent on salt level and water temperature but can also be affected by factors such as the chemical balance of the water and scale build up on the cell electrodes.

Minerals or Salt may need to be topped up to maintain the desired salt level of 1000 ppm.

Most spas requires about 2 hours of operation per day. Running times will depend on volume of water, bather load, water temperature, time of the year, pump efficiency, salt or mineral level, cell age and condition, pH and water balance. In addition to normal running hours, the pump and filter should be run whenever bathers are in the spa (without the TankPro unit in operation)

Turn Off the TankPro Spa Chlorinator and remove the TankPro Cell from the spa whenever bathers are in the spa. Simply place the TankPro spa cell in a small bucket next to the spa when not in use.

When bathers have finished in the spa, replace the TankPro Cell back into the spa and turn the TankPro power back on. It also recommended to run the Spa Chlorinator in conjunction with the pump and filtration equipment immediately after use for a short running period of approximately 1-2 hours or long enough to achieve a desired chlorine reading in the spa.

It may be necessary from time to time to “super chlorinate” the water by non stop operation of the spa equipment (pump, filter and TankPro unit). Testing of the water is essential and the level of free chlorine should not exceed 3 ppm of free chlorine.

Chlorine production can be tested by taking a sample of water from within the spa and the furthest point away from the TankPro cell using a chlorine test kit or chlorine test strips.

Chlorine may be depleted by the following.

- 1. Bather load**
- 2. Debris**
- 3. Algaecide use**

After the addition of algaecide, a chlorine reading in the water may not be obtained for a period of time.

6. CELL MAINTENANCE

The TankPro Cell will need to be checked regularly to ensure that the cell electrodes are not clogged with scale. Scale is usually calcium carbonate but can also include traces of magnesium, copper, iron, fats, oils and lotions. Please Note: powdered chlorine (calcium hypochlorite) contains approximately 40% calcium, which will significantly contribute to scale building on the cell

electrodes.

If the TankPro cell is making chlorine and the buildup of calcium on the center electrode is not touching the outer mesh electrode or the buildup is only very slight, then there may be no need to clean the cell.

If the calcium deposit engulfs the center cathode and the outer mesh electrode, any or all of the following may result.

Restricted water flow around the cell

Interference to the electrical flow of power to the Tankpro Cell.

Little or No chlorine production.

(a) Cell Cleaning Procedure.

Important: Turn OFF Power to the TankPro unit by switching OFF the Electrical Power Outlet if handling, moving or cleaning the TankPro cell.

There is no need to disconnect the TankPro cell from the TankPro power pack when cleaning. If the cell is disconnected from the TankPro power pack please ensure that the cell plug (connector) is not immersed in water or cleaning solution. Doing so may damage the connector voiding warranty.

The TankPro cell should be inspected once a month, or more frequently for hard spa water and de-calcified as needed using the following method, ensuring optimum chlorine production.

(b) How to Clean the TankPro Cell.

Pull up TankPro cell, removing it from the spa water.

Disconnect the TankPro cell from the TankPro power pack if necessary.

Locate a suitable area to prepare for the cleaning of the cell.

Do Not attempt to clean the TankPro cell electrodes by abrasion (scrubbing or tapping electrodes)

(c) Cell Cleaning Solution Preparation

It is preferable to use **White Vinegar** to decalcify the TankPro cell.

Double check the TankPro Power Pack is Switched Off / Disconnected from the power source. Immerse the the TankPro cell directly into the White Vinegar solution & let soak for 12 Hours. Remove the cell & hose off with a strong jet of water.

If the use of White Vinegar does not adequately decalcify the cell then the proceed to use a dilute acid & water solution, prepared according to the following procedure.

Precautions when using Hydrochloric acid should be noted.

Always use / handle acid in a well ventilated area.

Avoid breathing the fumes from the Hydrochloric acid.

Always have nearby a hose or bucket of clean tap water for accidental spills.

Read the acid manufacturers safety precautions and handling methods prior to using.

Protective rubber gloves should be worn when preparing the solution and cleaning the cell.

Important: Double check that the power to the Tankpro Chlorinator is OFF.

In a plastic container or bucket add 8 to 10 parts of WARM (not boiling) water.

(Cold water may be used with longer immersion time for cell de-calcification.)

Add 1 (one) part Hydrochloric Acid to the water.

(Hydrochloric Acid may be purchased from your local hardware or pool store)

Important: Always Add Acid to Water. NEVER add Water to Acid.

Gently stir (using a plastic instrument) acid into water to combine, diluting acid before immersing the cell for cleaning.

Immerse the TankPro cell completely in solution. The mixture may effervesce for up to 30 minutes.

If deposit is stubborn, the process may need to be repeated or simply left in the solution overnight.

When the TankPro cell is clean & free of calcium deposits, rinse the TankPro cell using fresh water.

Reconnect the cell to the Power Pack (if required), return and immerse cell back into spa, apply power and check operation of the unit.

(d) Recommendations to help prolong the life of the TankPro Cell.

Do Not tap the Tankpro cell electrodes or end caps with any instrument – this damage is obvious and VOIDS CELL WARRANTY.

The boiling of hot water for solution preparation is NOT recommended. This may damage the cell VOIDING WARRANTY. Please ensure only hot tap water is used at no higher than 60 °C or simply use water left at room temperature.

NEVER pour undiluted acid (Hydrochloric Acid) directly over cell electrodes. This can significantly contribute to cell degradation that will decrease the production of maximum available chlorine by the cell also allowing the possibility of water sanitation destabilization, VOIDING CELL WARRANTY.

Always add acid (hydrochloric Acid) to the water, in the cell cleaning solution prior to the immersing of the TankPro cell.

DO NOT add acid (Hydrochloric Acid) to the water after the TankPro cell is immersed in the cell cleaning solution. **This may damage the cell and Void the TankPro Cell warranty.**

(e) Age & Life Span of the TankPro Cell.

After a number of years (usually 5 – 10 years), cell replacement may be required.

Premature aging of the TankPro cell may result from:

Heavily encrusted calcium scale on the TankPro cell electrodes, left for long periods of time.
Cleaning the TankPro cell in a stronger than recommended cleaning solution
(too much Hydrochloric Acid in the cleaning solution)

Obvious signs of Cell deterioration may be discoloration of the outer electrode (mesh).

Please contact Tankpro via our website for any assistance required. tankpro.com.au

7. MINERAL / SALT LEVEL

The Mineral / Salt level should be checked on a monthly basis to ensure that it is maintained at 1000 ppm (0.1%). Minerals or Salt should be replaced after a significant amount of water has been lost from the spa in any way. Minerals or Salt is not lost during the process of chlorine production or when water evaporates. Minerals / Salt can be lost in the following ways:

Backwashing
Overflow
Splash out from bathers.
A leak in the plumbing.

When adding Minerals or Salt it is important to turn off the Tankpro power pack while undissolved salt is in the water. The best way to dissolve salt is to run the filter and pump (without the chlorinator) to circulate the water.

8. TROUBLESHOOTING & ELIMINATING PROBLEMS

The following is a list of possible causes of commonly encountered problems.

Chlorine Residual Low or Nil.

Not enough chlorine being produced. [refer to section 5]
Heavy Bather Load – insufficient running times [refer to section 5]
pH too high or low. [refer to section 1(c)]
Poor water circulation [refer below]
Filter problem [refer below]
Algaecide use in recent weeks. [refer to section 5]
Cell is dirty and needs cleaning [refer to section 6]
Cell is old and needs replacing – [refer to section 6) or contact TankPro]

Cell not producing chlorine.

No power to power supply.
Problem with connection between Cell and Power Pack.
Cell is old and needs replacing.
Problem inside Power Pack. [contact TankPro]

Unit working intermittently.

Salt level is too high. [refer to section 6]

Problem inside power pack or with cell. [contact TankPro]

Scale buildup on cell.

Cell requires cleaning. [refer to section 6]

Excessive calcium level [refer to section 6]

Very hard scale deposits on cell. [refer to section 6]

Poor Circulation.

Dirty or clogged filter.

Skimmer full of debris

Faulty pump.

Low / High speed switch on pump set to low. (only on some pumps)

Water level is low.

Filter Problem.

Filter may need backwashing [refer to filter manual]

Body fat or oils built up on filter cartridge / pads.

Sand Filters; The sand inside the sand filter may require changing.

Diatomaceous earth filters; Insufficient diatomaceous earth over the pads.

For any assistance with your TankPro Spa Chlorinator, contact us via the website at:

www.tankpro.com.au

