waterwitch

Electronic Water Leveller

Product Support Guide

COOKE INDUSTRIES

Full Electrical Certification
Inside & Outside use
(ESV160204)
C-Tick Approval
N11116

INTRODUCING THE WATER WITCH

Thank you for purchasing a Water Witch electronic water leveller. The Water Witch has been Australia's most trusted auto leveller for more than 20 years and is a product close to our heart – it gave rise to our business and established our reputation for outstanding quality.

The Water Witch began life during the 1980s as the Neptune's Mate automatic water leveller. As a pool builder I was frustrated with the poor quality and reliability of levellers available at the time. Neptune's Mate prototypes were developed and tested in my shed at home until we had a suitable production model. After a few years of production, further tweaks and improvements were decided upon. The Water Witch was born.

For the same reasons I developed the Water Witch, my industry friends began installing them into their pools and water projects. Its popularity has since soared and Cooke Industries has evolved from its Cookes Pools & Spas heritage to become a strong, independent business.

The Water Witch proudly remains Australian made to ensure we control production quality and deliver the very best product to you. Thank you for your support and we trust your Water Witch will deliver many years of reliable service.

Cliff Cooke
Managing Director

Product Support Guide

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COMPLIANCE NOTICE

bsi.

By Royal Charter

WaterMark Certificate Of Conformity – Level 1

This is to certify that	Nymet Australia Pty Ltd
ABN	
Head Office Address	1/53 Stanbel Road Salisbury Plain South Australia 5109 Australia
Holds Certificate Number	W4004
Standard	ATS 5200.030:2007 Technical specification for plumbing and drainage products Part 030: Solenoid Valves
Issue Date	21/09/2015

Is authorised to use the WaterMark as shown below only on products identified in the referenced Certification Schedule. Such products have been Type Tested and are manufactured under the Product Certification Requirements monitored by BSI to ensure that the manufacturing process has the capability to consistently produce products in compliance with and are certified to the appropriate Standard referred to above.
The Licence is granted subject to the rules governing the use of the WaterMark.

For and on behalf of BSI

Marc Barnes, Managing Director, BSI Group ANZ Pty Ltd

Originally registered	Latest issue	Expiry date
28/03/2012	21/09/2015	21/09/2020

WaterMark

JAS-ANZ

...making excellence a habit.

The WaterMark is a registered certification trademark of the Australian Building Codes Board (ABN 74 599 608 295). This Certificate of Conformity is issued for WaterMark type 1 under arrangement with Australian Building Codes Board. The use of this certificate is subject to the Client complying with the BSI Terms and Conditions. BSI Group ANZ Pty Ltd, Suite 2, Level 7, 15 Talavera Road, Macquarie Park, NSW 2113.
The validity of this certificate can be checked at website: www.bsi-global.com/clientdirectory and the JASANZ website: www.jas-anz.org/register. This certificate remains the property of BSI and must be returned upon its request. Template updated August 2014.

The Water Witch is approved for use in all Australian states and territories. To comply with Western Australia Water Authority regulations the water supply side must be installed as per this guide, with particular attention given to the 20mm air gap.

PRODUCT APPLICATIONS AND WARNINGS

The Water Witch is used in many different applications and projects to maintain a minimum water level. Some of the most popular applications include:

- Swimming pools and spas
- Water features and ponds
- Water / Splash parks
- Irrigation projects
- Balance tanks
- Infinity edge troughs
- Commercial pools
- Water tanks

Given the many suitable applications for the Water Witch, a quality installation is required to ensure performance is not affected by site conditions or any other factor.

Please note the following important project considerations:

- The Water Witch is manufactured and tested to the highest international standards. Wear and onsite conditions, however, may cause component failure. All installations must include sufficient overflow provisions to ensure a flooding event does not occur.
- Indoor pools and enclosed projects must also feature sufficient overflow provisions to avoid a potential flooding event.
- The Water Witch may not be suitable for installations where the water source is connected to a pressure pump. Confirm high and low pressure readings at your site to ensure the water supply pressure is always within the unit's required operating pressure.
- Contact your local water authority to confirm whether your proposed Water Witch supply side installation complies with the relevant water regulations.
- Individual components may need to be replaced in the future. All installations should incorporate provisions for easy part replacement.
- The Water Witch includes wearing components that may fail or be affected by onsite conditions. A visual inspection of all components is required at least every month to ensure the unit is operating correctly.
- The power supply must always be turned off and the Water Witch power lead removed from the power supply if the control box cover is being removed.

PRODUCT COMPONENTS AND PART NUMBERS

The reliability and durability of the Water Witch is founded on its simplicity – there are just three main components and the unit will work well if all components are functioning correctly and site conditions are suitable.

CONTROL BOX

WS345 Water Witch Control Box

SENSOR

WS355 Water Witch Sensor Only – 5m
WS356 Water Witch Sensor Only – 20m
WS357 Water Witch Sensor Only – 30m
WS358 Water Witch Sensor Only – 40m
WS359 Water Witch Sensor Only – 50m
WS360 Water Witch Sensor Only – 60m

SOLENOID AND CABLE

WS320 Water Witch Solenoid Only
WS330 Water Witch Solenoid Cable Only
WS335 Water Witch Solenoid & Cable

Note – Special order options are available for reverse sensors and sensors up to 250m long.

CONTROL BOX INSTALLATION

The Control Box is the brain of the operation. A circuit board within the Control Box continually receives signals from the Sensor to confirm whether the body of water is at the required level or if water needs to be added to the project.

INSTALLATION PROCESS AND CONSIDERATIONS:

- Position the mounting bracket at least 1.2m above ground level and ensure a consistent power source is within reach of the Control Box power lead.
- The Control Box is approved for indoor and outdoor use. However, locating the Control Box so it is protected from the weather will extend its serviceable life.
- Secure the mounting bracket to the desired position on a wall or post with appropriate screws for the backing material.

- Clip the Control Box into the bracket where it will be held in place.

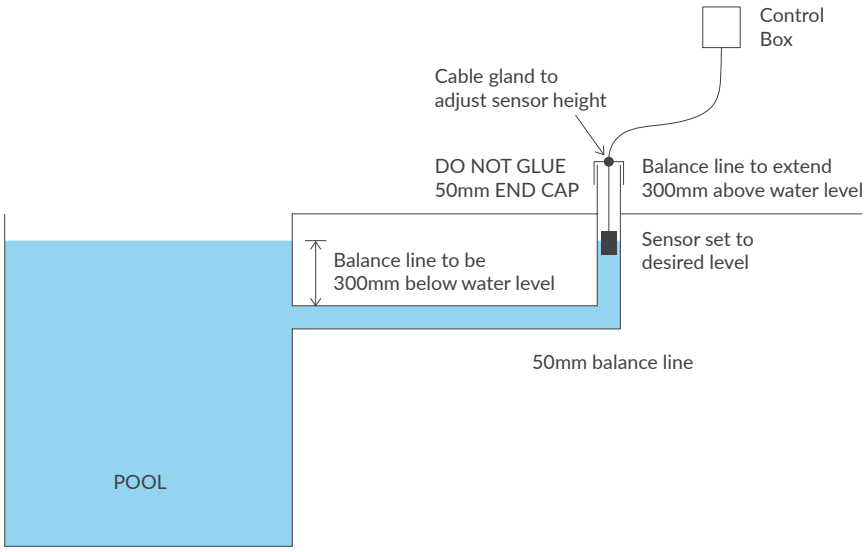
SENSOR INSTALLATION

The Sensor sits in a balance line, tank or trough to monitor the project's water level. A ball float inside the Sensor lowers as the water level drops, in turn connecting a light beam between two LED lights in the top of the Sensor. These lights complete an electrical circuit and the Control Box opens the Solenoid to add water to the project.

As water is added to the project, the water level rises and the ball float is pushed to the top of the Sensor. As the ball intersects the light beam at the top of the Sensor, the Control Box recognises the full water level. Instead of stopping the flow immediately, the TIME DELAY MODE then overfills the project for a set period as dictated by the particular setting.

The Water Witch Sensor is available in standard lengths of 5m, 20m, 30m, 40m, 50m and 60m. Special order sensors can be manufactured up to 250m long.

Sensor installed in first balance line



INSTALLATION PROCESS AND CONSIDERATIONS:

- Two 50mm class 9 or class 12 PVC pipes are required as balance lines from the project's wall to the pump and filter area. One pipe is for the sensor and the second is required for the fill line back to the pool. **ALWAYS USE 50MM PIPE FOR THE SENSOR HOUSING TO ENABLE ADEQUATE FLOW AROUND THE SENSOR AND FUTURE SERVICABILITY.**
- **THESE PIPES MUST BE PLACED AT LEAST 300MM BELOW WATER LEVEL** and can be dressed with push-in eyeballs to match the project's other wall fittings.
- The pipes are usually run along the suction and return trench and elbowed up within the equipment area. **THESE PIPES MUST BE LEVEL TO AVOID AIR LOCKS** which will affect flow and performance.
- A 50mm cap is provided to cover the sensor pipe housing and protect the Sensor from dust, debris, pests and foreign materials. The cap fits neatly onto the 50mm sensor pipe housing.
- **DO NOT GLUE THE CAP TO THE SENSOR HOUSING PIPE.**
- If the Sensor is to be located away from the equipment area, **ALWAYS RUN THE LEAD THROUGH ADEQUATELY SIZED CONDUIT THAT WILL ENABLE THE COMPLETE SENSOR TO BE REPLACED AT A LATER DATE.**
- **NEVER CUT EXCESS SENSOR CABLE.** Roll excess cable and bind together with the Velcro straps provided.

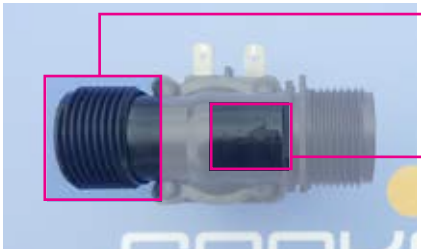
- **INSERT THE SENSOR PLUG INTO THE CORRECT PORT ON THE CONTROL BOX AS INDICATED ON THE LABEL.**

SOLENOID INSTALLATION

The Solenoid is regulated by the Control Box. When the water level is low the Control Box sends a 22V DC current to open the Solenoid so water flows in to the project. The Solenoid will close when the water level is restored to the correct level.

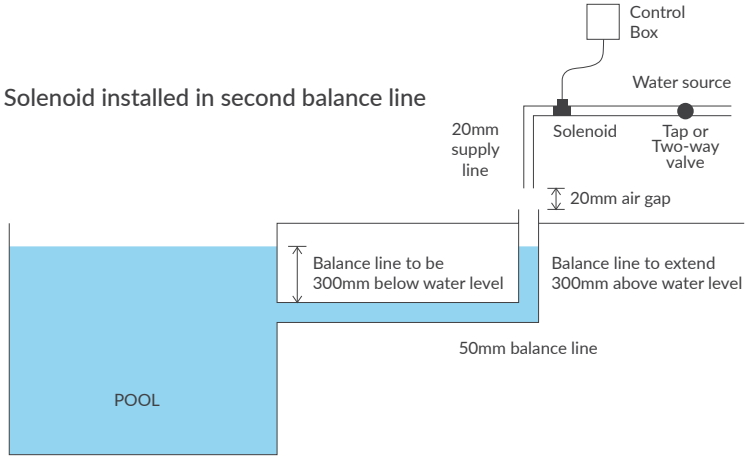
Solenoid cables up to 100m long are available by special order.

INSTALLATION PROCESS AND CONSIDERATIONS:

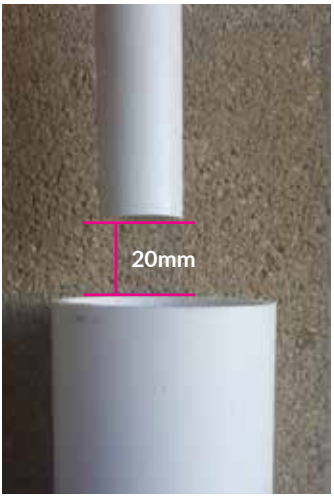


- The Solenoid has a 20mm male thread on each end. Connect to PCV or copper couplings and pipe on the water supply line.
- The Solenoid flow is one directional **ENSURE THE SOLENOID FLOW DIRECTIONAL ARROW IS POINTED IN THE SAME DIRECTION AS THE WATER FLOW.**

Solenoid installed in second balance line



- **A TAP OR TWO-WAY VALVE MUST BE PLACED BEFORE THE SOLENOID TO ENABLE THE WATER SOURCE TO BE TURNED OFF AT ANY TIME.**
- Standard installation positions the supply line 20mm above the fill balance line without a hard connection (An air gap is required to ensure the water from the project cannot contaminate the water source). **THE FILL FLOW RATE MUST NOT EXCEED THE RATE THE BALNCE LINE TRANSFERS WATER INTO THE PROJECT.**
- If approved in your local area, the fill line can be plumbed into the filtration return line. If installing in this manner, **A BACKFLOW PREVENTER MUST BE INSTALLED BETWEEN THE SOLENOID AND THE WATER SOURCE TAP.**



- The solenoid requires an operating pressure range of 29-116 PSI (200-800 kPa). **ENSURE THE ONSITE PRESSURE IS SUITABLE FOR CORRECT OPERATION OF THE SOLENOID.** Install a pressure limiting valve on the water supply line if the onsite pressure is greater than 116 PSI (800 kPa).

- **INSERT THE SOLENOID PLUG INTO THE CORRECT PORT ON THE CONTROL BOX AS INDICATED ON THE LABEL.**

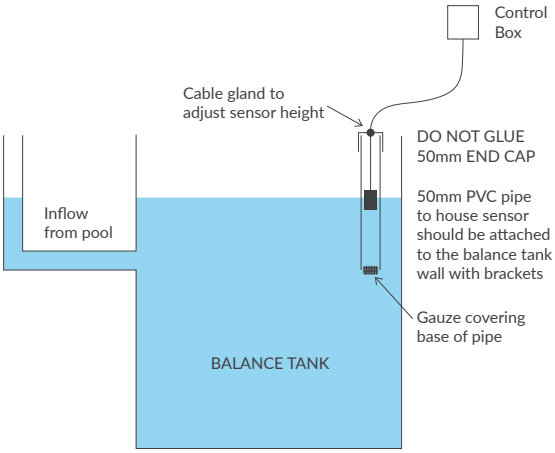
The solenoid is a wearing component with an indefinite operating life. Your project should include suitable overflow provision in case of possible solenoid failure.

ALTERNATIVE INSTALLATION OPTIONS

BALANCE TANK

The Water Witch is the most effective auto leveller for balance tank installations.

Maintaining a minimum water level in the balance tank will ensure the pump and pool equipment is protected whilst also allowing for the high water level fluctuations caused by bather activity and excess rainwater.



INSTALLATION CONSIDERATIONS:

- The Sensor should be housed inside 50mm class 9 or class 12 PVC pipe attached to the wall of the balance tank. Fasten the pipe to the wall with brackets, ensuring there is enough clearance at the top to attach the Sensor end cap.
- Run the Sensor cable through appropriately-sized conduit to ensure the Sensor can be accessed for serviceability and replaced if required.
- Small debris capable of affecting sensor performance can build up inside balance tanks. It is advisable to protect the sensor from small debris by covering it with a silt sock or stocking. Alternatively, cover the base of the sensor pipe housing with gauze so debris is blocked while water can still move freely.
- An overflow provision will need to be installed at the maximum water height inside the balance tank.

INFINITY EDGE TROUGH

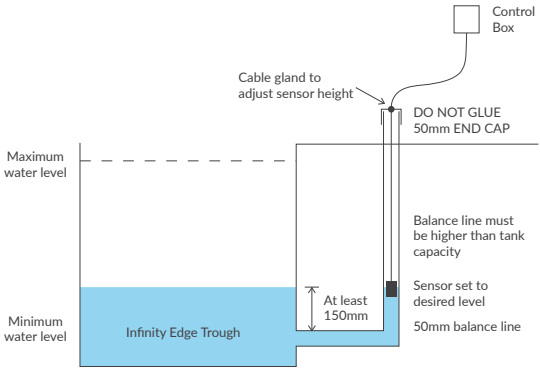
An infinity edge provides pool projects with additional design flexibility and creativity. However, such designs pose additional challenges to ensure the pool operates effectively and equipment is protected.

There are two crucial design factors to consider in relation to the required water level within an infinity edge trough:

- A minimum water depth must be maintained within the trough to ensure enough water is available to fill the pool and generate an overflow into the trough before the trough runs dry. Failure to do so will most likely result in severe pump, equipment and site damage.
- The water level in the trough may increase dramatically during a significant rainfall event or heavy bather load. The trough capacity above the minimum water level must sufficiently allow for this increase.

INSTALLATION OPTIONS:

- This diagram represents the recommended installation layout. Note that onsite limitations may not make this configuration possible.
- A second option is to use the balance tank layout on Page 10 for installation within an infinity edge trough.



START-UP PROCESS

It's now time to start your Water Witch. Complete the following process to test your unit and confirm all components are operating correctly:

STEP 1: Ensure the project is filled to the required water level.

STEP 2: Ensure the sensor and solenoid plugs are connected to the correct ports of the Control Box (Sensor on the left and Solenoid on the right).

STEP 3: Turn the power and water supplies on and ensure the solenoid flow directional arrow is pointing in the same direction as the water flow.

STEP 4: Lift the Sensor from the balance line and hold it upside down to simulate full water level. The ON and SENSE lights should flash in unison every 2-4 seconds.

STEP 5: Turn the Sensor around the right way up to simulate low water level. The ON light should continue to flash every 2-4 seconds and the FILL light should be solid. The Solenoid should also open and add water to the project.

STEP 6: Repeat steps 4 & 5 a few times to confirm the unit turns on and off correctly.

STEP 7: Attach the sensor end cap to the sensor balance line and hold the sensor cable while you loosen the cable gland. Slowly lower the Sensor until the water flow stops and the ON and SENSE lights flash every 2-4 seconds. Re-tighten the cable gland to set the sensor level.

THE SENSOR IS NOW SET AT THE CORRECT LEVEL. COMPLETE STEPS 8-10 ON THE FOLLOWING PAGE TO SET THE CORRECT TIME DELAY MODE.

TEST AND TIME DELAY MODES

The Water Witch features four time delay settings that control the length of the FILL cycle. The time delay slightly fills the pool with additional water to prevent the Water Witch from continually engaging and disengaging the FILL cycle. The four time delay settings are controlled by the position of dip switches inside the bottom right corner of the Control Box.

Refer to the following table for the appropriate time delay setting for your project:

Mode Description	CAPACITY (LITRES)	SWITCH 1	SWITCH 2	SWITCH 3	SWITCH 4	ADDITIONAL FLOW
Test Mode	N/A	UP	UP	UP	UP	2 Seconds
Spa	Up to 10,000	UP	**DOWN**	UP	UP	13 Seconds
Pool	10,000-50,000	UP	UP	**DOWN**	UP	75 Seconds
Commercial	More than 50,000	UP	UP	UP	**DOWN**	330 Seconds

STEP 8: **TURN THE POWER SUPPLY OFF AND UNPLUG THE WATER WITCH POWER LEAD.**

STEP 9: Remove the Water Witch Control Box cover and set the Dip Switches to the correct mode as per the table above.

STEP 10: Replace the Water Witch Control Box cover, plug in the power lead and turn the power on.

THE WATER WITCH IS NOW SET TO THE CORRECT WATER LEVEL AND TIME DELAY MODE.

If you need to test the Water Witch or any of its components you must always return the unit to TEST MODE as per the correct dip switch setting.

OPERATION OF INDICATOR LIGHTS

Signal lights on the Control Box confirm its operational status and illuminate as per the following three sequences:

- **ON and SENSE lights are flashing in unison every 2-4 seconds** – The Water Witch is sensing the water level and believes it is at the correct height.
- **ON light is flashing every 2-4 seconds and the FILL light is solid** – The Water Witch is in TEST MODE and is adding water because it believes the water level is low.
- **ON and FILL lights are solid** – The Water Witch is in one of the TIME DELAY MODES and is adding water because it believes the water level is low. **BOTH LIGHTS WILL REMAIN ILLUMINATED DURING THE TIME DELAY FILL SEQUENCE AND WILL ONLY RETURN TO SENSE MODE AFTER THE ADDITIONAL WATER HAS BEEN ADDED.**

TROUBLESHOOTING PROCESS

If your Water Witch is not operating correctly upon installation or you suspect a fault after years of reliable service, follow the steps outlined below then refer to the table of faults to identify the issue:

Return the Control Box settings to Test Mode as per the instructions on Page 13. **ENSURE THE POWER SUPPLY IS TURNED OFF AND THE WATER WITCH POWER LEAD IS REMOVED FROM THE POWER SUPPLY WHEN REMOVING THE CONTROL BOX COVER.** Refer to the following tables to identify the fault being experienced and the action required to remedy the fault.

WATER WILL NOT TURN ON:

<table>
<tr><th>Light Display</th><th>Possible Fault</th><th>Remedy</th></tr>
<tr><td rowspan="3">ON & SENSE</td><td>Sensor – debris may be impeding function</td><td>Remove screws & disc plate from bottom of Sensor. Remove ball to clean the inside of Sensor and LEDs</td></tr>
<tr><td>Sensor plug not inserted correctly into control box

or

Individual sensor wires have been damaged or removed from sensor plug</td><td>Ensure sensor plug is inserted into correct port at base of Control Box, inspect sensor plug for damage and check wires are connected as follows:

<table><tr><td>RED</td><td>GREEN
BLACK</td><td>YELLOW</td></tr></table></td></tr>
<tr><td colspan="2">Sensor may need to be replaced if these actions do not correct fault</td></tr>
</table>

TROUBLESHOOTING PROCESS (CONTINUED)

WATER WILL NOT TURN ON:

Light Display	Possible Fault	Remedy
ON & FILL	Water supply is not turned on	Turn water supply on
	Water pressure is too high	Install a Pressure Limiting Valve between supply tap & Solenoid to reduce pressure
	Solenoid has been installed backwards	Ensure the flow directional arrow on the Solenoid is pointing in the same direction as supply flow. Reinstall if required
	Solenoid wire is damaged or does not have a positive connection to control box	Ensure there is a solid connection for electrical current. A multimeter should record 22V DC at the end of the solenoid cable and 7-9V DC whilst the Solenoid is drawing power
	Water pressure is too low	Supply pressure must be 29-116 PSI (200-800 kPa)
	Solenoid may need to be replaced if these actions do not correct fault	

WATER WILL NOT TURN OFF:

Light Display	Possible Fault	Remedy
ON & SENSE	Solenoid – debris may be inside the solenoid	Unscrew the four screws on the Solenoid. Remove the body and diaphragm and inspect for debris. Clean if necessary
	Split diaphragm	Open Solenoid and inspect diaphragm for a split. Replace Solenoid if required *If no debris or split diaphragm detected, supply pressure is most likely too high*
	Water pressure is too high	Install a Pressure Limiting Valve between supply tap & Solenoid to reduce pressure

Special note - Some sites may experience a fluctuation in water pressure which can lead to intermittent overfilling. Monitor and test site pressure as a possible cause.

Be aware there is a tiny spring and rod inside the solenoid. Be careful not to lose those items when removing the top. Take notice of which position the rod & diaphragm are in, as incorrect insertion will prevent the solenoid from functioning.

TROUBLESHOOTING PROCESS (CONTINUED)

WATER WILL NOT TURN OFF (CONTINUED):

Light Display	Possible Fault	Remedy
ON & FILL	Sensor plug inserted backwards or wire in plug is connected backwards (new installs generally)	Ensure sensor plug is inserted into correct port at base of Control Box and check wires are connected as follows: RED | GREEN BLACK | YELLOW
	Sensor – debris may be impeding function	Remove screws & disc plate from bottom of Sensor. Remove ball to clean the inside of Sensor
	Sensor or Control Box has failed	**Return Control Box to Test Mode and complete the following to confirm fault:** • Hold Sensor in upright position to simulate low water level • When water starts flowing remove the sensor plug from the Control Box • If water turns off and control box lights change to ON & SENSE, the sensor is faulty • If water continues to flow and lights on the Control Box are ON & FILL, the Control Box is faulty

OTHER FAULTS

Most of the faults identified in the TROUBLESHOOTING PROCESS section relate to the Sensor, the Solenoid or onsite/environmental conditions. These faults represent more than 80% of faults experienced in the field, however, they do not cover all fault scenarios.

Potentially, the Control Box could be damaged and this is often not identifiable as a single, consistent error. Indicators that the Control Box may be damaged include:

- None of the lights on the Control Box are illuminated
- All lights flash quickly and/or faintly
- The solenoid clicks and pulsates rapidly
- Components on the circuit board are corroded, damaged or blown
- There are markings caused by water ingress

You will most likely need to replace the Control Box if you are experiencing any of the above faults. If the Control Box housing is in good condition we offer a factory service to replace the circuit board only. This is a more affordable option than replacing the full Control Box. Contact our office via info@cookeindustries.com.au for more information about this service.

Excessive water hammering in the supply lines is often experienced onsite and is usually misinterpreted as a fault with the Water Witch. Rather than indicating a fault with the unit, the water hammering is typically a sign that the Control Box time delay setting has been left in Test Mode. Please refer to TEST AND TIME DELAY MODES on Page 13 for more detail.

MAINTENANCE AND SPECIFICATIONS

Most Water Witches operate reliably for at least 5-10 years under normal operating conditions. The following maintenance schedule should be adopted to optimise the unit's serviceable life:

- **Monthly** – Observe and inspect all components to ensure the unit is operating correctly. Particular care should be taken during the first month after installation to ensure the system is operating correctly.
- **Half-yearly** – Inspect the Sensor to ensure it is free of debris, the ball moves freely within the Sensor and the Sensor activates the Control Box as required.
- **Annually** – Remove the solenoid pre-filter to clear any debris or contaminant.

Maintenance checks should be conducted more regularly for commercial applications.

Product	Water Witch Elecronic Water Leveller
Control Box	
Power	240V AC, 50-60 Hz
Weight	635g
Dimensions	150mm x 115mm x 60mm
Sensor	
Sensor weight (excluding cable)	130g ± 10g
Sensor cable length	5m, 20m, 30m, 40m, 50m or 60m Special order sensors are available up to 250m
Solenoid	
Solenoid cable length	5m (Special order solenoid cables are available up to 100m)
Plumbing connection	20mm male thread on inlet and outlet
Power	12V DC
Operating pressure	29-116 PSI, 200-800 kPa
Ambient conditions	Ambient temperature: 2° to 60° Celsius Relative humidity: 0% to 100% Water temperature: 2° to 80° Celsius

WARRANTY NOTICE

Cooke Industries will provide a new or repaired part or component at its discretion in place of any part or component, which is found upon inspection, to be defective in material or workmanship during the warranty period.

Said part or component will be repaired or replaced without charge to the initial user during normal working hours at the place of business of Cooke Industries or a Cooke Industries nominated distributor upon the consent of Cooke Industries.

This warranty does not apply to failure occurring as a result of abuse, misuse, negligent installation or repair and/or alterations or modifications whatsoever made to the product without the express written consent of Cooke Industries. This also extends to outside influences or site conditions which may impede or obstruct the correct functioning of the unit.

Warranty claims are to be lodged at www.cookeindustries.com.au/warranty

Please note the user must submit the serial number and proof of purchase to make a claim under this warranty.

SPECIAL CONDITIONS

1. Onsite labour, service call or freight charges to return items to Cooke Industries are the responsibility of the purchaser.
2. Under no circumstances whatsoever shall Cooke Industries be liable for incidental or consequential damages, inconveniences or expenses in connection with the removal or replacement of this product.
3. In circumstances whereby it has been deemed that the installer has clearly not followed the steps and information as set out in this guide (negligent installation), the warranty will become null and void.
4. Under no circumstances will Cooke Industries be liable for damage caused to persons or property as a result of the incorrect installation or misuse of this product.

waterwitch

Electronic Water Leveller

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