

XTEND ELEMENTS PRODUCT GUIDE

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PRODUCTS

A 2kW XTEND element heats water at approximately the same rate as a 3kW standard resistive element, reducing energy consumption by 1kWh per hour of use. For an average household this is approximately 1000 units each year. 2kW XTEND element = 3kW standard element: 3kW XTEND element = 4kW Standard element.



FLANGE MODEL



SCREW-IN MODEL

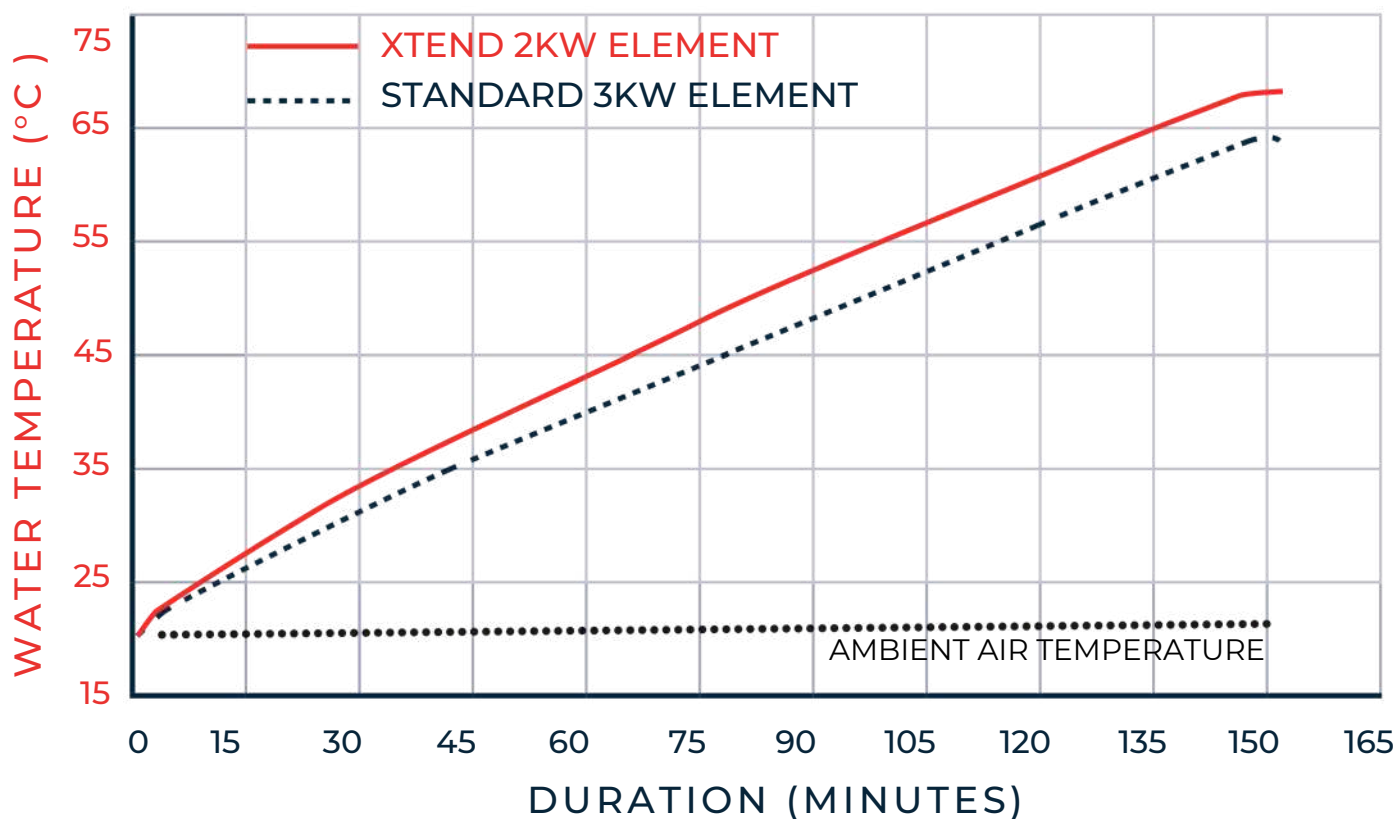
XTEND TECHNICAL SPECIFICATIONS

MODEL	2KW FLANGE	3KW FLANGE	2KW SCREW-IN	3KW SCREW-IN
Power (w) $\pm 10^{\circ}\text{C}$	2000	3000	2000	3000
Rated Voltage (V)	230	230	230	230
Inrush Current (A)	11-15	17-23	11-15	17-23
Inrush Duration (s)	60	60	60	60
Steady State (A)	9	13	9	13
Resistance (Ω)	50-200	50-200	50-200	50-200
Dry Burn Cycles	Tested to over 5000 cycles			
Material	316 Stainless Steel with PTC ceramic core			
Weight (kg)	1.79	1.85	1.00	1.16
Length (mm)	400	400	300	360
Diameter (mm)	50	50	35	35
Surface Temp ($^{\circ}\text{C}$) $\pm 10^{\circ}\text{C}$	220	220	220	220

COMPARATIVE HEAT UP RATES

The graph shows that a 2kW XTEND element heats water at around the same rate as a 3kW standard element. These are independent results from Kwikot test facilities comparing new elements.

Over time, XTEND elements will maintain efficiency better than a standard element due to reduced scale build up and the inherent nature of PTC.

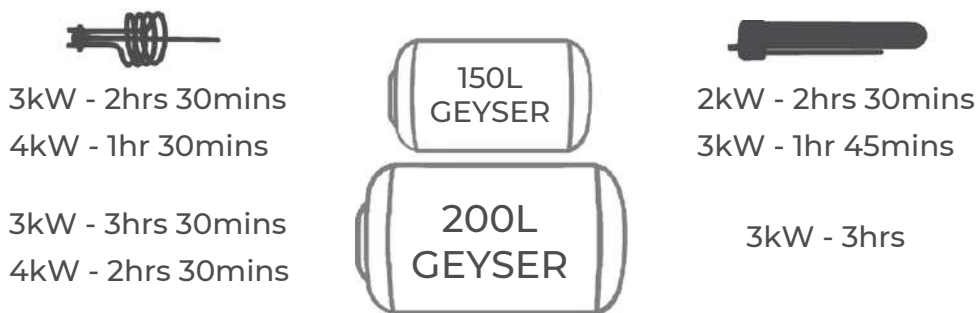


WHAT SIZE ELEMENT DO I USE?

This depends on how you use hot water. The image below shows the heating times.

APPROXIMATE HEATING TIMES FROM COLD

**Assumption - 40°C change in temperature



If high volume of hot water are used throughout the day then it is sensible to use the 3kW element. If not, and you are keen to install solar panels, a 2kW element will help use more of your own power and less from the grid.

BENEFITS

ENERGY SAVING	XTEND elements use around 25% less energy than a standard element, by reducing heat losses. XTEND elements use positive temperature coefficient (PTC) instead of resistive wire. PTC has a lower watt density and better heat transfer. XTEND elements have a maximum surface temperature of 240°C in air (220°C in water). A standard element is over 500°C. To compensate for the lower watt density, XTEND elements have a much larger surface area than standard elements. The combination of PTC and other design features ensure that more of the heat is transferred to the water and less to the environment.
HARD WATER	XTEND elements PTC heating chips are protected by 316 (marine) stainless-steel. The low watt-density reduces the rate at which lime scale and other solids build up on the element and inside the tank. By the time a standard element fails it is only heating at around 50% efficiency. XTEND elements maintains efficiency over time and can be cleaned if required. XTEND elements will also not burn out, it will simply stop drawing power. (See dry burn below)
SOLAR PV	A 2kW XTEND element heats at a similar rate to a 3kW standard element (see graph). A 2kW load works well with any solar PV system and turns the geyser into an energy storage asset, not an additional problem.
DRY-BURN	The key property of PTC is that the internal resistance increases to 100% at the designed set point. I.e. once the element reaches 240°C it stops drawing power. If a geyser empties a standard element will quickly melt and fail. XTEND elements will reach 240°C and stop drawing power in air. After about 15-20 minutes, as the element is in an insulated geyser, the XTEND elements will turn on briefly, reach 240°C and turn off again. This is defined as a dry burn cycle. XTEND elements are tested to over 5,000 of these. This means that if the geyser empties or fails, the XTEND elements can be installed in the new geyser and will work as designed.
SIMPLE INSTALLATION	XTEND elements require no additional parts and are installed exactly like a standard element. Any qualified person can do this. We would recommend installing a new thermostat when you install an XTEND element. Installing a timer can also reduce heating costs and is required for XTEND elements to work well with solar PV.

CASE STUDIES

SAVINGS	Issue: Electricity cost too high in home Solution: Install XTEND element Result: R1,000 went from lasting 7 days to 10 days Customer Comment: I have noticed an immediate saving in my electricity bill. I have a prepaid meter and my usage has been very constant amount that would last almost exactly a week. I am now topping up the meter every 10 days or so. Awesome.
SAVINGS	Issue: Solar PV system installed and the geyser was using too much energy and power. Solution: Install XTEND element in Kwikot geyser Result: Energy used by geyser reduced from 180kWh to 140kWh for the test periods Customer comment: All energy is measured in detail on my house including my geyser. XTEND element has reduced my electricity purchase costs.
HARD WATER	Issue: South 32 mines was replacing elements every 2- 3 months due to the water quality Solution: Install XTEND element Result: After 12 months the XTEND element was still working. It was removed and inspected. There was some limescale, but much less than a normal element after 3 months. The limescale was not uniform and was not affecting performance. The XTEND element was cleaned to remove all scale and reinstalled. It is still working well after 18 months. Customer Comment: XTEND elements has saved me 6 elements changes so far. This is a lot of money saved and irritation avoided.
SOLAR PV	Issue: Batteries on home solar system not lasting through the night Solution: Install XTEND element in 1 x 150L Kwikot geyser Result: The batteries last through the night as XTEND requires less energy in the morning to top up the heat after night-time water use. The batteries are full faster and there is more energy from the solar system to power other loads. Installing an XTEND element has significantly reduced the amount electricity I purchase.

INSTALLATION GUIDE

Bath and shower water is 40-45°C. Geysers should heat water to above 55°C to kill bacteria. The water in the geyser is hottest at the top and coldest at the bottom.

Setting the thermostat depends on multiple factors, but the goal is to set it to the lowest acceptable temperature in order to minimise energy consumption.

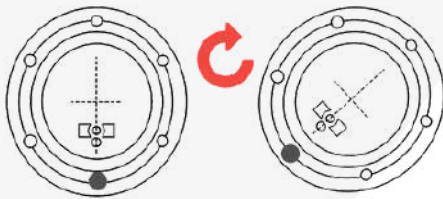
The set temperature on a stat can vary by up to 10°C from stat to stat. If the water is too hot or cold, the stat may need to be adjusted.

50MM FLANGE MOUNT MODEL FITMENT

A standard element has the thermostat in the middle of the element. Thus heat is constantly passing the stat. With XTEND elements, the thermostat is not only lower in the geyser, it is below the element. As heat rises, the thermostat gets the heat later than with a standard element.

The stat setting will vary by geyser, but we recommend setting the stat 10°C lower than for a standard element.

1. Ensure **NO WATER** gets inside the grub screw hole during fitment.
2. For Kwikot geysers turn the base plate clockwise by one screw fitting as below



3. Turn thermostat down 10°C from original setting.



**** TURN THE
THERMOSTAT DOWN BY
+/- 10°C ****

If this step is not followed the water may be too hot for the customer and then require an additional site visit to adjust the thermostat down.

We recommend replacing the thermostat as the element is new and it is good practice to install a new thermostat at the same time. This can prevent additional site visits to replace old and faulty thermostats.

35MM BOSS SCREW-IN MODEL FITMENT

- Some of the screw-in spiral elements have the thermostat pocket in the center of the element.
- This is not possible with the PTC design.
- When the XTEND screw-in element is installed, the thermostat pocket needs to be separate.
 - Some geysers have a separate pocket.
 - Some have a spare port that can be used as a pocket. This requires some additional parts.
- The thermostat setting will depend on the position relative to the element.

TROUBLESHOOTING

Problem	Possible reasons and suggestions								
Water not hot or lukewarm 	If the geyser is not heating up, the following could be the cause: 1. Faulty mixing valve 2. Reverse thermosiphoning 3. Hot water leak 4. Ring main 5. Faulty timer or controller 6. Faulty thermostat 7. Faulty wiring or circuit breaker 8. Faulty element. Please check all of the above before assuming it is the XTEND element. We also advise that you connect the element to the power to ensure it is drawing current and to test the thermostat physically by turning the thermostat down to switch the element off and then up again to ensure that the thermostat is functioning correctly.								
Tripping the earth leakage or circuit breaker 	XTEND elements require a high current on start-up, due to the ceramic chips inside needing more power upon start up than standard resistive elements. If the element is tripping it could be due to any of the following: 1. Circuit breaker is faulty or very old 2. Wiring is loose around circuit breaker 3. Connecting wires are too small or loose 4. Thermostat is faulty 5. Circuit breaker is too small 6. Dead short in the cable 7. Water inside the element will cause a short (This can trip the entire DB) 8. Tripping element. Please therefore always check the entire electric pathway for any potential faults before returning the XTEND element as faulty. In most cases, it is not XTEND elements causing the problem.								
Setting the thermostat correctly 	XTEND elements: 1. are at least 25% more efficient 2. locate the thermostat at the bottom of the geyser For this reason, it is important to adjust the thermostat setting down to prevent overheating and to maximise savings. Most houses set thermostats around 60°C, some at 65°C, others at 55°C With XTEND elements it is possible to set the thermostat 10°C to 15°C lower than standard, depending on the number of hot water users. <u>The following thermostat settings are recommended:</u> <table><tr><td>Family of 1-2</td><td>: 40°C</td><td>Family of 4</td><td>: 50°C</td></tr><tr><td>Family of 3</td><td>: 45°C</td><td>Family of 5</td><td>: 55°C</td></tr></table>	Family of 1-2	: 40°C	Family of 4	: 50°C	Family of 3	: 45°C	Family of 5	: 55°C
Family of 1-2	: 40°C	Family of 4	: 50°C						
Family of 3	: 45°C	Family of 5	: 55°C						

FOR MORE INFORMATION YOU CAN ALWAYS CALL OUR XTEND ELEMENTS HOTLINE ON 087 057 9126

WARRANTY PROCESS

If there is an issue on site and the installer is concerned that the issue is related to XTEND element, they must contact XTEND elements from site. Once it is established that the XTEND element is at fault a replacement will be arranged at the store from which the element was purchased. XTEND elements will then test the element and confirm the status of the warranty request.

Field Results

Most returned elements were working as designed. The issues discovered were as follows:

- Faulty thermostats
- Incorrectly set thermostats
- Loose wiring
- Faulty or incorrectly set timers
- Faulty breakers
- Shorts in the wiring

Please see the XTEND elements troubleshooting guide and ensure that the issue is isolated.

XTEND elements can be tested in dry air and will not break. The current will peak at no more than 15A and then reduce to zero once the PTC has reached 220°C (in water) .

WARRANTY Terms & Conditions

1.Our Goods and Services

We (120 Degrees (Pty) Ltd) supply the Xtend PTC heating elements (the "Product").

2.Read the Instructions.

Please carefully read and follow all instructions that come with our Product. Please also read our website at www.xtendelements.co.za for instructions on installing and using our Product.

3.Content and Scope of the Warranty

We warrant that the Product is free from manufacturing defect, for a period of three years from the date of purchase, subject to the following conditions:

- 3.1. This warranty covers the Xtend PTC heating elements only, and does not cover any other part or parts of the installation which may become damaged as a result of the failure or defect of our Product.
- 3.2. In the event of you notifying us of a Product defect, we (at our own discretion) shall elect to either:
 - 3.2.1. repair or replace our Product with a new or re-manufactured one; or
 - 3.2.2. refund the purchase price of our Product.
- 3.3. If we elect to refund the purchase price, such refund shall be calculated with reference to the original Product purchase price, reduced pro rata in relation to the expired period of the warranty.
- 3.4. We shall not be liable for any costs associated with the removal, disassembly, shipment of and re-installation of our Product/s.
- 3.5. Our liability for the installation cost is limited to the installation of our Product and does not extend to any costs for the reinstatement of the surrounding areas, which were required to be removed or disassembled, in order to obtain access to repair or replace our Product.
- 3.6. We shall not be liable for any claims, losses, liabilities, damages, costs or expenses arising in connection with the use, functioning or malfunctioning of our Product or any defects.
- 3.7. We shall not in any circumstances be liable for any inconsequential or indirect damages, loss of profits or punitive damages.
- 3.8. This warranty will be invalidated if any repairs are effected on our Product at any time by any other party.
- 3.9. The original invoice and/or proof of installation must be provided to ourselves in the event that the serial number is removed from the Product. Failure to provide same will render this warranty null and void.
- 3.10. We do not make any warranties or representations in respect of the installation of our Product. Claims in respect of the installation of our Product must be referred to the applicable installer, who shall be solely liable under any installation warranties provided.

4.Term and Period of Warranty

- 4.1. The period of warranty shall begin from the date of invoice.
- 4.2. The delivery of new or replacement Product/s, in fulfilment of warranty commitments, shall not have as a consequence an extension of the original warranty period nor a recommencement of said warranty period from the time of said delivery of new Product/s.

5.Necessary Preconditions for Claims Made Under Warranty

- 5.1. Present the original invoice.
- 5.2. Notification of any claims to be made under warranty must be sent to our Customer Service Dept. in writing, within the warranty period, but no later than 7 (seven) days after your discovery of the fault or defect in question.
Email: info@xtendelements.co.za
120 Degrees (Pty) Limited, PO Box 51701, Waterfront, 8002, Cape Town
www.xtendelements.co.za
- 5.3. The notification of any claims must include:
 - 5.3.1. customer name, address and contact details;
 - 5.3.2. location of installed Product/s;
 - 5.3.3. original invoice from Product purchase; and
 - 5.3.4. a brief description of the alleged defect/s.
- 5.4. You shall allow the return of the defective Product for replacement and repair or arrange, at our discretion, the inspection of the defective Product at the location specified above.
- 5.5. Any defective Product which you return to us under this warranty must be suitably packaged and the related freight and transportation is for your account. You shall bear the full responsibility for any risks associated with the return of our Product

WARRANTY Terms & Conditions

5.6. Unless mutually agreed to by both of us, our inspection of the defective Product shall take place during normal working hours.

5.7. In the event that our inspection of the defective Product results in our determination that there is no valid warranty claim, you shall be liable for and pay the costs of the associated inspection fee.

6.Cases Not Covered by the Warranty

6.1. In cases where the following examples are found, or where signs are detectable on the Product that one or more of the following might have been the case, no rights or claims exist under the present warranty:

6.1.1. The use of the Product for a purpose contrary to its intended purpose.

6.1.2. External influences exerted on the Product, such as vandalism, natural catastrophes, environmental influences, fire, weather-related influences, or other natural phenomena.

6.1.3. Our Product's burnout due to excessive water hardness or improper settings during commissioning. This also includes commissioning without water.

6.1.4. Water quality and conditions not being equivalent to SANS 241.

6.1.5. Insufficient maintenance.

6.1.6. The carrying-out of installations, repairs, or refurbishing on the Product in question by a third party who fails to follow the installation instructions.

6.1.7. For safety and performance reasons, you are required to ensure that the installation, repairs and replacement of geysers conform respectively to SANS 10254, SANS 10106 and SANS 1352.

6.1.8. Upon completion of installation, the third party who attended to the installation is required to issue a PIRB Certificate of Compliance which is certified by a PIRB Licensed and registered plumber. For further details visit www.pirb.co.za.

6.1.9. Fair wear and tear.

6.1.10. Improper voltage, sudden voltage spikes or power fluctuations in the electrical supply.

7.Disputes

7.1. In the event of any dispute of any nature whatsoever arising between ourselves, and not resolved through our Customer Relations Department, then

7.1.1. such a dispute shall be submitted to Tokiso (Pty) Ltd, that the dispute remains unresolved following the negotiations of clause 7.1, the parties will submit to mediation in terms of their mediation procedures.

7.1.2. Unless otherwise agreed between the parties, Tokiso will nominate the mediator.

7.1.3. The first mediation meeting will be convened to start not later than 7 (seven) days after the date of the written notice.

7.1.4. The mediation shall be held in Cape Town.

7.2. No party may commence any court proceedings /arbitration in relation to any dispute arising out of this agreement until it has attempted to settle the dispute by mediation and either the mediation has terminated or the other party has failed to participate in the mediation, provided that the right to issue proceedings is not prejudiced by a delay.

7.3. Any warranty claim shall be governed by the laws of the Republic of South Africa, and you consent to the jurisdiction of the South African courts in the event of any unresolved dispute.

7.4. If any of the provisions of this warranty is found by a court of competent jurisdiction to be invalid or unenforceable, that provision shall be deemed null and void and the remainder of the warranty shall continue in full force and effect.

8.Proprietary Rights

8.1. You acknowledge and agree that the Product you have purchased is protected by intellectual property laws and international intellectual property treaties. Our Product's intellectual property protection extends, but is not limited, to copyright, trademarks, service marks, design rights and patents. You are authorized to utilize the Product for its intended purpose.

8.2. Our Product may not be sold, reproduced or distributed without our written permission. Any further rights not specifically granted herein are reserved.

8.3. All Intellectual Property Rights belonging to ourselves shall remain vested in us.

8.4. None of our Intellectual Property Rights shall be used by yourself for any purpose without our prior written consent

Standard & XTEND Elements Compared

STANDARD RESISTIVE ELEMENTS	XTEND ELEMENTS
Use a coiled wire to turn electricity into heat. This has not changed much in 100 years	Use a positive temperature coefficient (PTC) ceramic to convert electrical energy into thermal energy
Surface temperature of around 500°C	Surface temperature of 220°C
Varying metal alloys encase the coiled wire. These are all relatively soft and prone to corrosion and scale build up which cause failure	Encased in marine-grade (316) stainless steel Large surface area to reduce impact of scale build-up Design makes XTEND easy to descale
Burn out when geyser empties or scale build-up becomes too much	Scale build-up is significantly reduced XTEND element will switch off when 240°C is reached. It will not burn out and can be cleaned or installed in replacement geyser and work as designed

Reducing the temperature from 500°C to 220°C slows the process of scale build-up and other negative chemical reactions. The rate of heating is not affected as XTEND elements have a far bigger surface area through which to exchange heat.

XTEND elements require a thermostat. The set temperature is typically around 10°C lower for an XTEND element than a standard element, this is because the thermostat is positioned lower on the XTEND flange element range.

The XTEND element design reduces system heating losses, reducing the electricity required to heat your water.

FAQ

Why do XTEND elements cost more than standard elements?

XTEND elements save money! They are made of much higher quality materials and are designed to reduce energy costs and last a long time. XTEND elements will not break if you geyser bursts and can be installed in the replacement geyser. XTEND elements should be compared against solar thermal and heat pumps, rather than against standard elements. Compared with these, XTEND elements are affordable and have a faster payback period.

What is PTC Ceramic?

PTC stands for Positive Temperature Coefficient. What it means is that at a set temperature (XTEND = 220°C) the internal resistance reaches 100% and the element stops drawing power. This is useful when a geyser bursts as the element does not burn out.

Do XTEND elements work with all geysers?

Yes. XTEND elements come in a flange model (Kwikot, Heattech) and a screw-in model (others).

Do XTEND elements require additional parts to install?

XTEND elements are designed to be fitted to a flanged geyser in the same manner as a standard element. No additional parts are required. Geysers that require a screw in element may need to install the thermostat separately.

Does installing an XTEND element affect my geyser warranty?

No. XTEND elements have letters from most major manufacturers confirming that their warranty remains valid with XTEND installed.

How long is the XTEND element warranty?

XTEND elements are warranted for 3 years in SANS compliant water. XTEND elements are designed to have a useful life of over 10 years.

How do XTEND elements use less power to achieve a similar result?

XTEND elements reduce system losses. The lower watt density and large surface area balance to provide efficient heat transfer. The PTC ensures that the power drawn is matched to the rate of heat transfer. XTEND elements cause less scale build up and are less affected by this, maintaining comparative efficiency over time.

What is the temperature difference between an XTEND element and a standard element?

XTEND elements have a maximum surface temperature of 240°C. Standard elements operate at over 500°C. This temperature is only reached when the geyser is empty.

What different XTEND element models are there?

XTEND elements have a flange and a screw-in model.

Do you need a thermostat with XTEND elements?

Yes. XTEND elements heat to 240°C. The water will boil away if the thermostat does not turn off the power. If the thermostat does fail and this causes the geyser to empty, XTEND will reduce power use. See question 'Will XTEND element break if my geyser empties?'

FAQ

Why do you need to turn down the thermostat temperature with an XTEND element installed?

Due to the thermostat position and other factors, we recommend turning down the stat by around 10°C. This will deliver the same mixed thermal energy in the tank as the old element.

Why is it a good idea to turn the base plate 1 bolt clockwise on Kwikot geysers?

This changes the position of the element to the side to increase convection. It also raises the position of the thermostat in the geyser.

If the base plate is not turned the stat may have to be set a bit lower.

What size XTEND element do I need in my geyser?

The power required depends on the rate of heating.

A 2kW XTEND element heats at the same rate as a 3kW standard element. For most households, 2kW is fine for 150 and 200 litre geysers and 2kW is better for solar and the national grid.

If hot water usage is high and heating needs to occur faster, we recommend installing the 3kW version.

Why are XTEND elements good in hard water?

There are a few factors:

- Lower surface temperature
- Lower watt density
- Marine-grade stainless-steel
- Cylindrical shape
- Positioning of heating chips

These factors together reduce scale build-up, maintain efficient heat transfer, and reduce the reactions of the element with the chemicals and solids in the water.

What impact does scale build up have on element efficiency?

Scale build-up reduces the element efficiency. By the time a standard element fails, it will only be around 50% efficient.

XTEND elements address this issue with low watt-density and design

Can you clean an XTEND element?

Yes. XTEND can be cleaned with Cal-C Clean or any suitable solvent.

12 MONTHS BEFORE CLEANING



12 MONTHS AFTER CLEANING WITH CALC CLEAN



FAQ

Will my XTEND element break if my geyser empties?

No. XTEND elements will stop drawing power when the temperature reaches 240°C. If the geyser is empty this heat will dissipate very slowly. Once the internal temperature is < 240°C XTEND elements will draw current, reach 240°C and stop again. Each ON/OFF is known as a dry burn cycle. XTEND is tested to 5,000 dry burn cycles. Once the geyser is filled. XTEND element will operate normally again. If you replace the geyser the XTEND element can be taken out of the old geyser and put into the new one.

Will XTEND elements make my geyser last longer?

This is not a claim we can make, but the science points in that direction. XTEND elements will not overheat the geyser like solar thermal systems. As XTEND element reduces scale build up due to low watt density, it stands to reason that this will reduce the negative effects on the sacrificial anode. Chemical reactions typically happen faster in higher temperatures. As XTEND operates at around half the surface temperature of a standard element, it is likely that these reactions will reduce. Geysers with XTEND have shown less scale build up than before XTEND was installed.

Why is installing a timer a good idea?

A timer can only save you money in one of 3 ways:

1. Reduce standing losses
2. Heat less water
3. Turn geyser on when power free (from solar PV)

If you only heat the geyser just before use and then store cold water, you will reduce the heat lost and money wasted. If you only use 30 litres for a shower you do not need to heat 150 litres. As the hot water rises you can just heat the top portion.

If you have installed a solar PV system, you can use the timer to send power the geyser when the sun is shining.

What is solar PV?

Solar PV is solar electricity. Solar panels on the roof connect to an inverter which turns DC power into AC power than can be used to power your home or business.

Why do XTEND elements work well with solar PV?

XTEND elements have a low power draw (2kW instead of 3 or 3kW instead of 4) and converts electrical energy to thermal energy very efficiently. XTEND elements turn the geyser into a useful energy store for additional power produced.

Are XTEND elements SABS approved?

Yes. XTEND elements have been tested and passed for SANS 514.

SALES & MARKETING

You can find useful information on our blog, website and social media pages. Please follow up and share our posts and adverts to drive customer awareness within your friend and customer network.



www.facebook.com/xtendelements



www.facebook.com/xtendelements



xtendelements.co.za/news



xtendelements.co.za/video-series/

If you would like to link to our website or create your own content, please see the links to our logos and images. Any content created that uses our logo needs to be authorised before circulation. Please email adam@xtendelements.co.za for clearance.

Logos, product images and brand guidelines. xtendelements.co.za/resources/

Customer Testimonials

Please share your good news stories with us, on [Google](#) and [Facebook](#) reviews.

Promotions and Events

Please let us know if you need assistance for an event or promotion, we are always looking for new and interesting collaborations to raise awareness of XTEND elements, and to get more customers saving money.