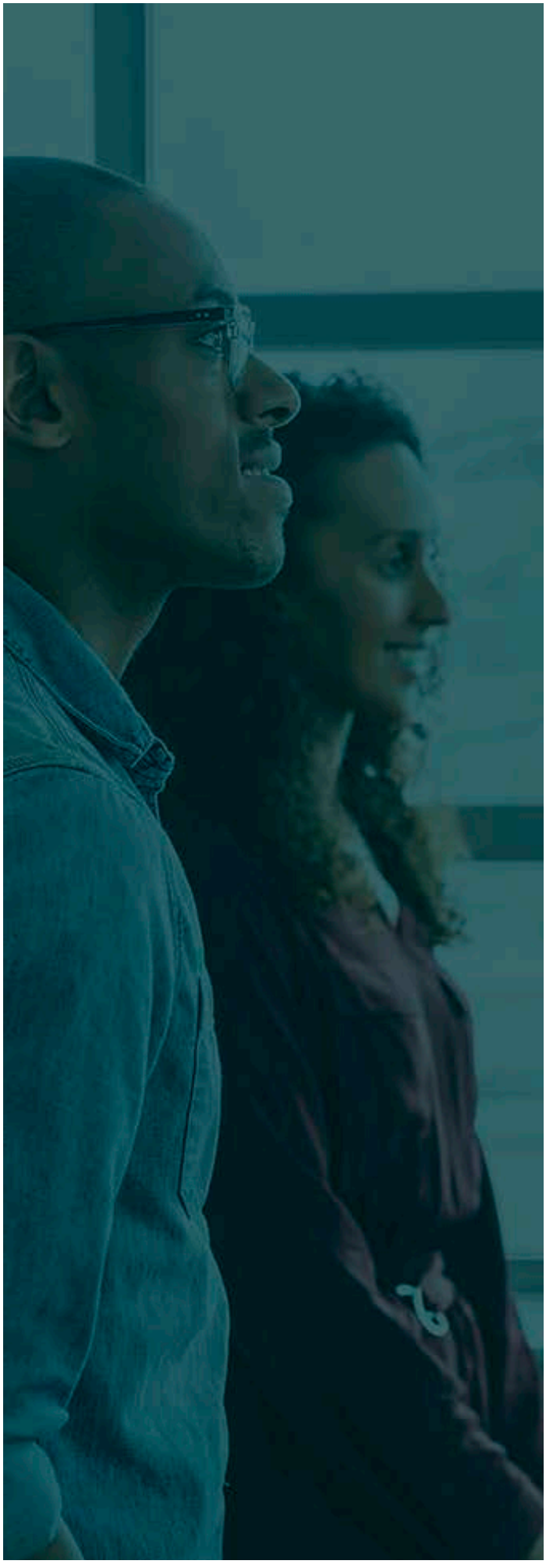
COMPANY OVERVIEW



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1. COMPANY OVERVIEW

The Company Overview is a brief summary of the intended business, including what it uniquely delivers, the mission, how it got started, market positioning, operational structure, and financial goals. After reviewing this section, the reader should have a broad understanding of what the business is setting out to do and how it is organized.

This section is not meant to be lengthy. Keep it short and succinct. This is the snapshot of the business. The type of business will determine what of the following sections will be required for the business plan. Only include what is needed to properly represent the business and remove anything else.

- **Company summary:** This is the introductory section to the company, also known as the 'elevator pitch' of what the company stands for and is setting out to do. Include the company's goals and some of the near-term objectives. Even if it is a small, service-oriented company, developing a summary is an important step to explain and focus the core business.
- **Mission statement:** This is a concise statement on the guiding principles of the company and what the company aims to do for customers, employees, owners, and other stakeholders.
- **Company history:** This provides the back story, especially the personal story, of why the business was founded. Use this section to give the overarching history of the company from its start and bring the reader up-to-date on where the company is now in terms of sales, profits, key services, and customers.
- **Markets and services:** This outlines the target market and related needs that the company will address. Include brief descriptions of offered services and targeted markets and customer types. This section can be a general overview as more details will be suggested in a later section of this plan.
- **Operational structure:** This describes the operational details of the business. List any potential employees needed on the payroll to make the business run.
- **Financial goals:** This describes the start-up capital needed, projected revenue and profits, forecast, and budget of the business.

CORE VALUES

VISION

We share a vision of providing the latest technology and always delivering to the highest standards providing our clients with the services and solutions which they are paying for with Service Excellence, rather than just doing a simple box drop.

MISSION

To be the trusted partners in IT Infrastructure and Alternative Power solutions offering unparalleled service excellence with dedication and professionalism. Adding value to our customers by providing the end-to-end solutions to suit your requirements and budget with an end to end sustainable solution.

VALUES

LOAC is committed to delivering Best Brands for Reliability, Excellence and operate with the highest standards of Integrity and PRIDE.

THE SIMPLE CHOICE FOR SOLUTIONS - OUR HISTORY

Life Outside a Cubicle Designs was established in 2010 with the sole purpose of providing clients with 34 Years' in-depth knowledge and expertise within the Information Technology sector.

LOAC is positioned to design, implement and support technology solutions to scale your requirements seamlessly and affordably.

Life Outside a Cubicle Designs is a Level 4 BBBEE contributor.

By partnering with us, you'll gain the benefit of our passion for service excellence, and our skills and expertise, providing you with real business value. A trusted partner in end-to-end Infrastructure Solutions.

Our Management team has a hands on approach during all projects we undertake and a firm belief in providing our customers the highest quality Service and support on all our product offerings. You are assured of our commitment to always go the extra mile in meeting your deadlines.

As we are a solutions provider, all our solutions are custom made according to our client's criteria and requirements. Prior to undertaking any project, we meet with our clients to do a needs analysis, based on this a solution is engineered and a proposal is submitted for approval.

All our work is carried out to the highest of standards, Site visits are done, together with power readings taken from client's premises, this enables us to determine the correct size genset required to provide power to the client's home or office.

Once commissioned all projects are handed over to client with a full report and explanation of the services offered. Over the past couple of years we have successfully maintained and supplied too many satisfied customers.

All gensets are installed and commissioned to SABS standards and Certificate of Compliance is issued to client.

As an added service to our clients, we offer a Diesel Generator refueling service, we will send a mobile bowser to site to fill your generator, and bill client for the diesel supplied.

During the course of 2015 we acknowledged the requirement to provide our clients with a range of self-sustainable Eco-friendly gas solutions.

With the inconsistent electricity challenges emerging the daily tasks of being able to make food as well as have a supply of hot water proved to be difficult.

Existing Homes are converted from the conventional Electric Geyser to Gas Geyser, as they need minimal power to operate, and provide a more efficient flow of warm water, these Geysers can be connected to Alternative Power Sources.

With our team of certified technicians, we have successfully completed approximately 25 new homes in the Steyn City Estate. Installation consist of the supply of gas lines from the SC junction box to all gas components within the home, namely geyser, Hob, Oven, Fireplace and Braai. Certificate of Gas Compliance is issued on each installation.

GAS MATERIALS SUPPLIED AND USED

- Paloma Range of Water Heaters
- Rinnai Range of Water Heaters
- HDPE Gas Piping and Connections
- PEX Gas Piping and Connections

TRACT Gas Piping and Connections

Electrofusion Welding of HDPE Gas Pipes

OFFERINGS

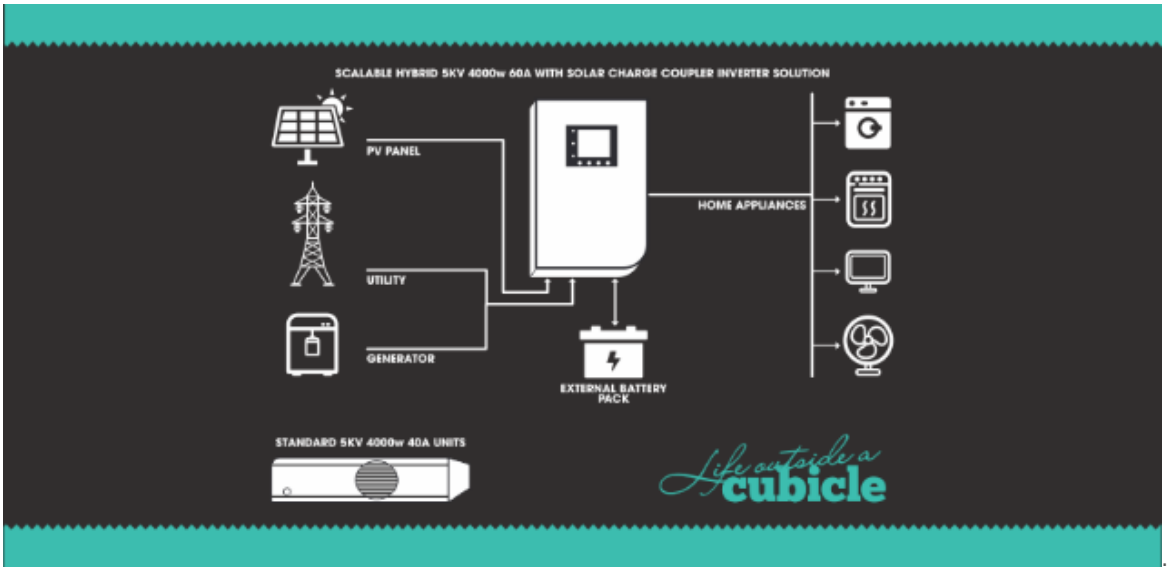
- Project Management,
- Network Reticulation
- Network Infrastructure
- Security Solutions
- Server Room Environments
- UPS solutions
- Video Surveillance and Monitoring Solutions
- Alternative Energy Solutions
- Networking Solutions for Residential and Commercial Market
- Information Technology Solution
- Server Room Environmentals
- Back up Power Solutions and UPS's
- Green Homes – Solar and Gas Installation and Reticulation
- Smart Home Offerings – Home Automation and Security
- Project Management – Construction and Renovations
-

We have decided to merge our knowledge gained into developing a true one stop shop, to assist our clients with their needs.

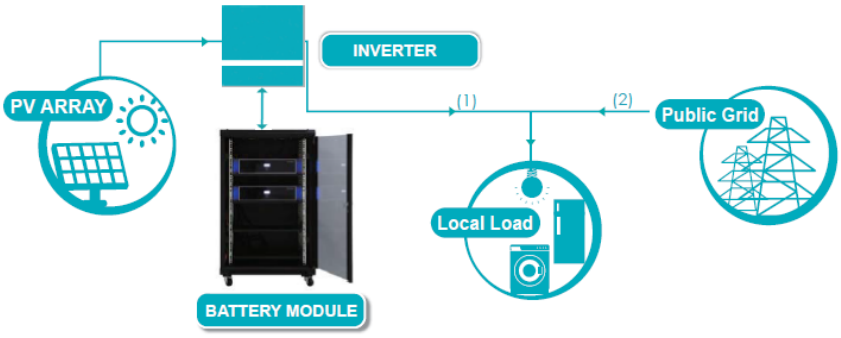
POWER

You rely on technology and your technology relies on power. Downtime disrupts more than your output.

We offer solutions to minimise downtime and maintain a consistent power supply with: UPS, Generator and Managed Power



Solution of ESS



Key Features of ESS

- Developed with our own LFP (lithium iron phosphate) cell to ensure the highest safety and most promising cycle life
- Self-designed BMS protects the cell in all angels such as abnormal temperature, current, voltage, SoC, SoH
- Maintenance free and easy installation saves the valuable main power

LAN INFRASTRUCTURE

Maintain smooth reliable intra-office communication network connected, with a strategically designed LAN infrastructure. Boost the level of your business operations with:

- Data & Voice Cabling
- Network Switching
- Fibre Optic Solutions

Our end-to-end solutions include analysis and design, and installation and integration. The result: impressive ROI figures, as well as meeting your technical demands and company objectives.

PROJECT MANAGEMENT,

NETWORK RETICULATION and

Network Infrastructure as well as

Security Solutions on Server Room Environments which go hand in hand with UPS solutions and Video Surveillance and Monitoring Solutions

SECURITY

The safety of your business or home, relies on access control. We integrate and manage your security infrastructure inline with your security goals.

- Access Control
- IP Surveillance/CCTV
- Intrusion & Perimeter Detection
- Video Management Service
- Booms
- Spikes
- Turnstiles

DATA CENTER

Your data centre is the heart of business operations. As more devices and applications are integrated into your business process, the greater your need for reliable capacity and speed. We build data centres to create a reliable flow of data across stable, secure networks.

- Cooling
- Fire detection & Suppression
- Environmental Monitoring
- Access Flooring
- Environmental Cabinets
- Data Racks & Containment

MANAGED SERVICES

As a leader, you focus on strategy and development. Allow us to manage and support your IT environment.
Managed services can help you reduce costs, improve system performance and protect your investments.
Maintenance Plans •Service Level Agreements •Standby & ‘Hot Swop’ Services

HARDWARE

Avoid the frustrations of dated infrastructure. Keep up-to-date with the latest hardware including laptops, desktops,
Hard drives, printers and servers. Together, we can design and implement an intelligent solution, enabling digital business and driving high performance.

SOFTWARE

By providing you with the latest software for your IT needs and specific vertical, we can revolutionise the way you run your businesses. We also strive to help reduce your overheads and bring down operational costs.

IMPLEMENTATION

By planning backwards from the desired result to the starting point, we offer your company successful IT implementation and deployment. This process includes realistic timelines,testing and quality control resulting in reliable solutions.

PRE- AND AFTER SALES

Our pre-sales team analyse your business requirements and assess each of your infrastructure areas. They focus on costing and scalability to create a solution for your immediate needs. Our after sales team match your business requirements to the manufacturer warranty and support services.

WORKMANSHIP

LOAC warranties its workmanship for a period of 12 months from date of installation, we also act as agents for our suppliers for the products which we have installed in your environment. Product warranties range from 1 year to 5 years depending on product.

ALTERNATIVE POWER PRODUCTS

- ICE Hybrid Inverters
- Modrac Hybrid Inverters
- Mecer Hybrid Inverters
- Kodak Range of Inverters
- Goodwe Range of Inverters
- Victron Inverters and Charge Controllers

SOLAR POWER PRODUCTS

- Canadian Solar Panels
- JA Solar Panels

BATTERY PRODUCTS

- First National Battery Lead Acid Deep Cycle
- Vision AGM Deep Cycle Battery
- Oliter Gel Deep Cycle Battery
- OmniPower Gel Deep Cycle Battery

- Pylontech Lithium Ion Battery
- Freedom Won Lithium Ion Phosphate Battery

POWER GENERATOR PRODUCTS

We are Accredited Dealers for the following Generator Brands

- Generator King
- Bundu Power
- Generator Warehouse

Intelligent hybrid inverter

An intelligent hybrid inverter or smart grid inverter is a trending generation of inverter for solar applications using renewable energy for home consumption, especially for solar photovoltaic installations. Some see this as a new technology, however in some parts of the world the application of such products has been around since the 1990s. Electricity from solar panels is generated only during the day, with peak generation around midday. Generation fluctuates and may not be synchronized with a load's electricity consumption. To overcome this gap between what is produced and what is consumed during the evening, when there is no solar electricity production, it is necessary to store energy for later use and manage energy storage and consumption with an intelligent hybrid inverter. With the development of systems that include renewable energy sources and rising electricity prices, private companies and research laboratories have developed smart inverters for synchronizing energy production and consumption.

THE TYPES OF INVERTOR SYSTEM & APPLICATIONS

OFF-GRID

Operating totally off the grid requires a large capacity battery array capable of powering the property during periods of low irradiance in winter and an inverter capable of supplying the maximum load ever required at one time. This requires a significant investment in PV modules, inverters and especially batteries which cannot normally be justified if there is a good quality grid connection available at the property. An off-grid system is well suited to rural areas with little or no grid connection but is unlikely to be a viable solution in a well-connected urban area. Should however fixed connection charges for electricity become more common and higher then disconnecting from the grid may become a more viable option in the future.

GRID-TIED

A pure grid-tied system with no storage or load management for a user with fixed rate power charges is a viable option for South Africa but the system will need to be significantly under sized to minimise the wasted energy generation as typically no surplus power can be exported. Essentially the PV system has to be sized to generate only sufficient power for the base load during the day, i.e. the fridge, freezer, pool pump and other permanently on devices. The low investment cost of a small PV system with a high self-consumption rate should make them quite attractive especially for households with family at home during the day.

GRID-BACKUP

If frequent load shedding continues each winter then there will be continued demand for grid-backup systems that can operate with no grid for prolonged periods of time. Adding a battery inverter or a hybrid inverter along with a battery makes it possible to combine the energy from the PV system with that from the stored battery to power at least the essential loads in the property. The size of the battery required depends on the rating of the essential loads to be driven from it at times of no solar power being available. Load shedding typically occurs during the evening peak in winter from 5:00PM – 10:00PM so there will normally be little or no solar power available to supplement the battery. Shown below is a typical system layout for a grid-backup system using a Solar PV inverter and a Battery Inverter which gives maximum flexibility in the system design and can be retrofitted to an existing Solar PV system:

An alternative solution for new installations is to use a combined PV and battery inverter, commonly referred to as a hybrid inverter. This is a multi-function device that includes all the functions required to configure a grid-backup solution:

ENHANCED SELF-CONSUMPTION

Typically a residential system will generate the most power during the day when household consumption is not at the maximum. Without the ability to export surplus power the only options are to reduce the size of the PV system so that excess energy is minimised but this also reduces the usable energy or to store the energy until needed. A typical daily load profile for a residential property is shown below;

With the above example reducing the size of the PV system by 50% would all but eliminate the surplus but would reduce the useful energy generated by 30%. The storage option could take the form of a battery system or using the surplus power to heat the hot water geyser. In the example above there is about 8kWh of surplus energy with could be used to heat the hot water with an insulated tank and/or recharge a battery for use in the evenings. Hot water heating is a very cost effective option which with a correctly sized PV system could provide the best return on investment. A large battery solution may add significantly to the cost and would have a long financial payback time at current electricity prices. The use of a time switch on a washing machine and/or dishwasher can help to maximise the use of generated energy during the sunshine hours.

PEAK-SHAVING

Many electricity users in South Africa, especially industrial, pay a very high tariff when they use higher amounts of electricity than normal during peak times. Some residential users are on tariffs which are higher during peak times of the day 5:00PM – 7:00PM or 06:00AM – 09:00AM for example or more for energy usage at any time above a certain threshold, e.g. 600kWh per month. In these cases a PV system may be used to limit the amount of higher cost electricity consumed by storing energy during the hours of sunlight and releasing it during the high cost periods. This may require additional timing controls to limit the time of usage of stored energy to these higher charge periods. The type and size of the battery is essential to any grid-backup or enhanced self-consumption system with many factors to take into account. Please read the Battery Guide for more information.

It is easy to see that South Africa could benefit from Solar PV. LOAC has stock of everything you will need for any of these installation types, will full pre and post sales technical support available if you need it.

SOLAR PV INVERTERS

INTRODUCTION

A Solar PV Inverter is needed in every grid-tied solar PV system to convert the DC power generated by the solar panels into AC power that can run the devices in the property.

There are many types of inverters that support different number of AC phases, optimised or not, number of trackers from various manufacturers.

This page guides you in selecting the right inverter for your system.

AC PHASES

Most residential properties have a single-phase connection and most commercial buildings and farms will have a three-phase connection. This factor normally determines if you need a single or three phase inverter.

You can however use one, two or three single-phase inverters on a three-phase supply, especially if you have different loads on each phase.

OPTIMISATION

Some inverters work in combination with optimisers that are fitted to each individual, or pair of solar panels. These ensure that every panel in the system will operate at its maximum capability for the life of the system. These are especially useful where there is some shading during a part of the day or where you want to monitor the performance of every module over the life of the system.

All inverters from SolarEdge work in combination with optimisers or a Tigo optimiser can be added to any other brand of inverter.

TRACKERS

For inverters that are not supplied with optimisers the solar panels are wired in series on one or more strings, each strings acts as if it is a single very large solar panel. The inverter has one or more built-in Multiple Power Point Trackers (MPPT) that take the power from one or more strings. This is an intelligent electronic circuit that automatically extracts the most possible energy from each string of solar panels.

For larger commercial systems it is better to have as few solar panels per tracker as practical as a failure or degradation in any one panel connected to a tracker will cause a loss of energy from all solar panels connected to the same tracker. The three-phase inverters from Huawei and Solis have three, four or even six trackers to ensure the minimum losses over the life of the system.

SOLAR PANELS

INTRODUCTION

A solar panel converts sunlight into electricity. They come in different sizes and colours with different solar cell types from various manufacturers.

Selecting a solar panel for a residential or commercial solar system requires understanding the different characteristics of each type of panel and the application.

On this page we explain some of the options and aspects to consider when selecting a solar panel.

SIZES

Solar panels for grid-tied systems come in two main sizes, depending on the number of solar cells they are made from. 60 cell panels are about 1.6m tall and 1m wide, 72 cell panels area about 2m tall and 1m.

Larger panels are not better because they are bigger, they will generate the same energy on the same area of roof as smaller panels. i.e. the performance of 5 X 72 cells panels will be identical to 6 X 60 cell ones with the same energy and the same roof area. The choice is about which size of panel will best fit the available roof space.

COLOURS

The solar cells in a solar panel do not completely fill the area of the solar panel, there is a small gap around the end of each solar cell. Every solar panel has back sheet on which the solar cells are fixed and this backsheet can be white or black. A black back sheet looks better as it is closer to the colour of the cells but is slightly more expensive and will cause the solar panel to get hotter when it will be less efficient.

The frame of the solar panel can be silver or black. This does not impact on the performance of the solar panel but a black frame looks a bit nicer on the roof.

CELL TYPES

A solar panel is made using solar cells. Each cell is about 6 inches, 125mm, square. The cells are made using one of two different materials, monocrystalline or polycrystalline. Polycrystalline is slightly cheaper but is less efficient so a solar panel made with monocrystalline cells will generate more energy than one made using polycrystalline cells, but will be more expensive. Monocrystalline cells are also darker and so best used when you want a black back sheet for the best looking solar panels.

MANUFACTURERS

There are 100s of solar panel manufacturers in the world all of who will claim to make top quality panels that will last for 25 years or more. They will all offer a warranty of 10 years or more but it is important to select a manufacturer who you can be confident will still be in business in 10 years to honour that warranty.

With major world brands like Canadian Solar, JA Solar and others you can be confident they will be around for the long term. Other smaller companies may not survive in the very competitive solar market. Often brand names you will see are not the actual manufacturer so it is important to find out who actually makes the panel and how secure they are as a business.

Between them the Top 7 solar panel manufacturers in the world made over 50% of the total panels made world-wide in 2017 and these form what is known as the Silicon Module Super League. It is highly recommended that you choose one of these brands to give you best the chance of long term reliability and performance.

BATTERY GUIDE

The choice of a battery is one of the most critical decisions that needs to be made when designing a grid-backup or enhanced self-consumption solar PV system. The two main types of battery commonly chosen for solar PV systems are Lead Acid and Lithium Ion with various different specific types and products from many different manufacturers available on the market. The table below gives a summary comparison of the key attributes of these two different battery technologies.

Attribute	Lead Acid	Lithium Ion
Total Storage Capacity	An individual lead-acid battery will typically have a gross storage capacity of 100Ah - 200Ah @ 12V or 1.2kWh - 2.4kWh. They may be connected in series for a higher voltage and/or in parallel for greater capacity at the same voltage. A typical lead-acid pack suitable for a residential grid-backup solution will be in the range of 8kWh - 25kWh depending on the length of time required to operate off-grid and the total power of the loads to be supported.	Lithium Ion battery packs typically are supplied as self-contained units with a built-in battery management system (BMS). Gross capacities vary from about 2kWh up to 8 - 10kWh depending on the model and manufacturer. Some models may be connected in parallel, others may be extended with expansion packs and all need to be fully supported by the software in the battery charger/inverter chosen.
Daily Usable Capacity	There is a close relationship between the amount of the total battery capacity that is used each day and the life of the battery as expressed by the number of cycles and typically it is recommended to only discharge a lead-acid battery down to about 50% of the total capacity of a lead-acid battery, this if referred to as a 50% Depth of Discharge (DOD). This makes the storage capacity available for daily use only 50% of the gross storage capacity.	Most lithium-ion batteries can be used daily down to about 90% of their gross storage capacity with little or no impact on their lifetime in terms of number of cycles. This makes the storage capacity available for daily 90% of the gross storage capacity.
Full Cycle Efficiency	Lead-acid batteries tend to get less efficient the nearer to full capacity they reach which either results in a low full cycle efficiency of less than 80% if they are re-charged near to their full capacity or designing the system to only use about 80% of their full capacity in order to maximise their efficiency.	Most lithium-ion batteries have a full cycle efficiency around 95% even for a cycle from their full depth of discharge up to full capacity making them ideally suitable for daily use applications like solar PV systems which need to use most or all of their retained energy in the evening/night and charge up again fully during the day.

Lifetime (Cycles)	The number of cycles that a lead-acid battery can be used for is directly related to the amount of energy charged and discharged in each cycle. With a system configured to utilise 50% of the gross storage capacity of a daily basis a typical lead-acid battery will have a lifetime of 2,000 - 2,500 cycles. Allowing for some degredation over the life of the battery a useful lifespan of about 5 years in a well designed system may be expected.	A good quality lithium-ion battery may have a lifetime of 5,000 - 7,000 cycles which is considerably more than 10 years of normal usage. The built-in battery management system will ensure that the battery condition is always maintained in optimum condition and a full 10 year life may be expected.
Cost	The initial investment cost of a lead-acid battery will be relatively cheap when expressed as Rand per kWh of gross capacity but all comparisons should always be done a Rand per kWh of usable capacity which makes a lead-acid battery twice as expensive as it may initially appear.	The initial investment cost of a lithium-ion battery may be 2.5 - 3 times more expensive per kWh of gross capacity compared to a similar sized lead-acid battery but when comparing the Rand per kWh of usable capacity the difference will be typically about 1.5 times as expensive. The lithium-ion battery will however last twice as long as the lead-acid so over a 10 year period the lithium-ion will almost always be a cheaper option with no need to renew the battery after 5 years.
Weight	A lead-acid battery may weigh between 70kg and 80kg per kWh of usable capacity so a typically 5kWh - 6kWh domestic battery pack may weight in excess of 350kg which may cause difficulty in locating a large battery pack in a residential property as a strong floor will be required.	A good quality lithium-ion battery pack will typically weigh between 10kg and 15kg per kWh of usable capacity so considerably less than a equivilant lead-acid pack but a typically residential battery pack will still weigh 75kg - 100kg requiring some consideration as to where to place it.
Charge / Discharge Power	Most lead-acid batteries can be charged and discharged relatively rapidly and when connected in parallel the total charge/discharge rate is in effect increased. In a typical solar PV system a lead-acid battery pack may be charged and discharged in 2 - 3 hours with a peak discharge rate much higher for short period of times.	Most lithium-ion batteries have a relatively restricted charge/dischage rate often needing 3 - 4 hours to charge and a maximum discharge rate of between 1kW and 2kW for a typical residential system. A system utilsing lithium-ion batteries therefore needs to be designed to take care to only connect essential loads to the circuit that will be powered from the battery pack.
Operating Temperature	Lead-acid batteries are significantly impacted by the ambient temperature and an increase from 20c to 30c can result in a 25% reduction in the lifetime as defined by the number of cycles and a 50% reduction in the lifetime as defined in years.	Lithium Ion is less impacted by moderate temperature changes and ambient temperatures in the range of 15 - 30 degrees centigrade will not significant impact the lifetime nor performance of the battery.

The choice of battery type is not a simple decision with many different factors to take into account but we would always recommend that a comparison is made using the above considerations and looking at the total cost over the life of the system and not simply choosing the lowest initial cost option which in many cases may be more expensive over the life of the system. Equally critical is the size of the battery with one too small providing insufficient benefit and one too large being a significant additional unrequired expense. Detailed below are some of the factors that need to be considered when determining the size of battery required:

Attribute	Comments
Essential Load Energy Usage	For a grid-backup solution the most important thing to consider is the loads that need to be supported when the grid has failed. It is not generally practical to consider powering all the loads in the property, e.g. an electric oven, geyser and pool pump will all consume considerable amounts of electricity and would require a very large battery to run even for a short time. A good way to consider this is to generate a list of essential energy loads to be backed up and the amount of time they're needed in a typical day. An essential load is basically something energy must always be available for. This could be something normal like a freezer or burglar alarm, or something site specific like a fish tank. If no power was available, would it lead to loss of (fishy) life or just defrosted ice cream? In the UK, power cuts are relatively rare but for more remote locations or other countries it is definitely worth considering. A lot of loads won't require their maximum power all the time, so you can add a factor to take that into account. Once that's done, you'll have an accurate baseline of energy consumption and be able to consider the appropriate battery capacity.

Load	Power (W)	Time	Factor	Daily (Wh)
Lights	200	5	1	1000
Fridge	150	24	0.3	1080
Freezer	150	24	0.2	720
WiFi Router	10	24	1	240
Phones	50	1	1	100
Fish Tank	30	24	1	720
TV	170	4	1	680
Other	100	24	1	2400
Total				7690

Battery Operating Time	The next critical decision is to decide the number of hours that the system needs to power the essential loads for. Typically a planned grid outage due to load shedding will last for 4 - 6 hours whereas a failure due to a grid fault will typically last for between 1 and 24 hours. The decision on how many hours to allow for is largely driven by the budget available as the cost of the battery pack will be directly related to its size and its size will be directly related to the number of hours chosen. Usually a system will be sized to support the essential loads for between 12 - 24 hours.
Space Available	Especially when choosing a lead-acid battery the space available to hold the installed battery and the strength of the floor may be a consideration that imposes a limit on the maximum size of the battery that can be installed. With a Li-Ion battery this is unlikely to be a major concern as a Li-Ion battery will be much smaller and lighter than a similar usable capacity of lead-acid battery.
Charging Time and Rate	The battery will be charged from the surplus energy available from the PV system, this is the difference between the energy generated by the solar PV system and that used by the loads during the daylight hours. It is therefore important to ensure that the battery can be fully recharged during a typical day of sunlight, especially in the winter months. A battery pack which is too large relative to the PV system will not get fully recharged and therefore not be fully available to provide power in the event of a grid failure.
Maximum Depth of Discharge	Each battery pack will have a recommended maximum depth of discharge, e.g. lead-acid might be 50% and Lithium Ion might be 90%. Having determined the total energy required to be generated from the battery pack with the equation : 'essential loads energy in 24 hours divided by 24 multiplied by the required battery operating time' then the gross battery capacity needs to be determined by dividing by the recommended DOD. e.g. 7690W / 24 * 12 hours / 90% DOD = 4272kWh.

USEFUL READING AND WEBSITES

SAPVIA: The South African Photovoltaic Industry Association (SAPVIA) is a not-for-profit organisation that reports on industry news, updates and guidelines.

Visit their website here http://www.sapvia.co.za/
South African Government-Energy: http://www.gov.za/about-sa/energy
Engineering News : Industry news and updates http://www.engineeringnews.co.za/page/renewableenergy

SOLAR PANELS

Founded in Toronto in 2001, Canadian Solar Inc provides a range of solar energy solutions and is a leading global manufacturer of solar PV modules. As one of the world's top five manufacturers, Canadian Solar is making a real difference by delivering more clean, safe and affordable solar energy to the world. Its industry-leading products include high-efficiency solar cells, solar modules, solar power systems and off-grid solar power application solutions.

Ever since its inception, Canadian Solar has been dedicated to changing the lives of all of its customers for the better. Its PV panels have been thoroughly tested and proven under harsh conditions, allowing the manufacturer to offer a 25-year warranty with confidence. Through these premium-quality solar products, Canadian Solar gives customers complete peace of mind – and it is these products that have helped to set the company apart from the competition.

Thanks to its successful business subsidiaries across six continents and state-of-the-art manufacturing facilities in Canada, China, Brazil and South East Asian countries, Canadian Solar has delivered more than 33 GW of premium-quality solar modules to customers in over 150 countries. The manufacturer also operates three state-of-the-art PV research centres for cells, modules and systems in both Canada and China.

With projects currently being developed in the US, Japan, Latin America, Australia, EMEA, South East Asia, India and China, Canadian Solar's total project pipeline is now 9 GW.

In South Africa, Canadian Solar has sales and technical support. Its PV panels are particularly well suited to the harsh environment and extreme temperature ranges common in the region.

JA Solar Holdings Co. Ltd. is a leading global manufacturer of high performance photovoltaic products based in Shanghai, China. The company has been the world's leading cell producer since 2010, and has firmly established itself as a tier one module supplier.

JA Solar is committed to providing modules with unparalleled conversion efficiency, yield efficiency, and reliability to enable customers to maximize the returns of their PV projects.

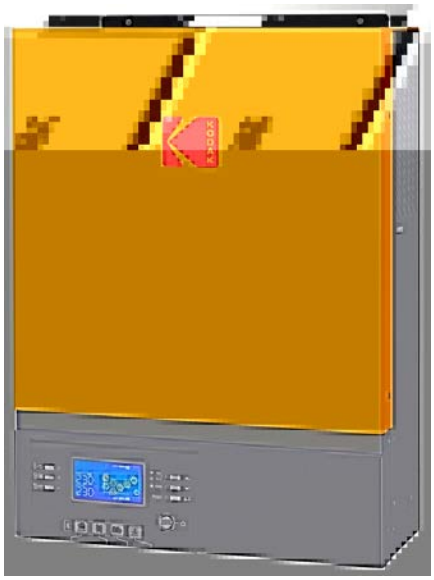
JA Solar modules provide reliable quality and use PID- free components and all modules come with a 10 year product warranty on materials and workmanship, and a 25 years linear performance warranty. JA Solar offers its customers high quality products with higher than average efficiencies at a very good price to performance ratio.

JA Solar places great focus on the optimization of module manufacturing processes to continuously improve their efficiency and reliability. The power rating of JA Solar's PV-modules in mass production is on average about 5 to 10 watts above industry average

LOAC stocks the JA Solar 60 and 72 Cell Polycrystalline modules and the sleek Mono Percium All Black available for immediate shipment, catering to all commercial and domestic applications.

For more information, please visit the JA Solar website.

KODAK Solar Products to provide brand-new, tier 1 solar technology to the South African market.



The powerful yet efficient KODAK Products offer unparalleled photovoltaic (PV) solutions for grid-tied, off-grid and hybrid systems to both homeowners and commercial organisations for a more sustainable way of living.

KODAK Solar Modules and Inverters deliver reliable solutions to ensure both homeowners and business owners have access to a consistent supply of energy in times of grid unreliability. The monocrystalline and polycrystalline panels offer high levels of module conversion efficiency, while the KODAK Solar Inverters range from 3kW to 4.6kW to suit a wide customer base.

GoodWe (Jiangsu) Power Supply Technology Co. Ltd is a renewable energy enterprise focused on the technical development and manufacture of solar PV inverters and monitoring solutions.

The industrial designs of the GoodWe's ES and EM series bi-directional hybrid inverters derive from technology demanded by German standards and are best suited to on-grid applications.

The GoodWe hybrid inverter includes both single and twin MPPT trackers to maximise the energy yield from either one or two independent strings of PV panels. The product also features a battery charger for lead-acid or lithium ion batteries and a pure sine wave inverter for generating mains voltage. During the daytime, the PV plant generates electricity which can be supplied to the connected loads and any surplus energy is used to recharge the connected battery pack for later use.

Additionally, this inverter has two AC outputs: one connected to the main loads or non-essential loads and a second connected to essential loads. The latter remains live in the event of grid-failure as it is powered from the connected battery pack.

There are many aspects to selecting a system and we recommend you read our guides to System Types and Storage Batteries to better understand this technology.

LOAC holds stock of the GoodWe 3.0KW, 3.6kW and 5KW Inverter in the EM range and the 4.6KW in the ES range.

If you want to know more about GoodWe, you can find out more on the manufacturer's website.

Life outside a cubicle

victron energy
BLUE POWER

Founded in 1975, Victron Energy designs inverters, chargers and solar storage solutions for residential and commercial projects worldwide. The company is a technology-focused and sales driven business relying on a robust R&D team.

Victron Energy products are sophisticated, smart and customisable and the company is continually developing to bring the newest and most advanced equipment to the solar market.

The MultiPlus Inverter/Charger is suitable for grid-connected and off-grid installations. It is equipped with a host of advanced features such as uninterrupted power supply, remote monitoring and load limit settings as well as advanced AC OR DC coupled systems. It is also well known as one of the best and most robust product range out there.

Victron's SmartSolar Charge Controller uses the latest MPPT technology to maximise energy harvest and intelligently achieve a full charge in the shortest possible time. This product helps to maintain battery health and extends battery life and support a wide range of battery types. Easy setup via Bluetooth using a Victron mobile APP.

For the perfect combination of an MPPT charge controller, inverter/charger and AC distribution centre, the EasySolar solution from Victron offers all of the above in a single enclosure.

Victron Energy products epitomise luxury solar applications with outstanding efficiency and no compromise in performance.

BATTERY CARE

HOW TO MAKE YOUR BATTERIES LAST LONGER

Discover how to use, store and charge your investment to prevent frequent, expensive replacement and to ensure that the battery will perfom at its peak for its designed life.

The average battery life has become shorter as energy requirements increases rapidly. Three complaints are heard more often now: “My battery won’t take charge, my battery won’t hold charge and is only 6 months old”. Only 30% of batteries sold today reach the 48-month mark. In fact 80% of all battery failure is related to sulphating. This build up occurs when the sulphur molecules in the electrolyte (battery acid) become so deeply discharged that they begin to coat the lead plates of the batteries. Before long the plates become so coated that a barrier is built up that will result in high internal impedance; the battery loses the capability to transfer power or take any charge.

The causes of sulphating are numerous – some causes include:

1. Batteries stand too long discharged between charges, as little as 24 hours in hot weather and several days in cooler weather.
2. Battery storage: leaving a battery standing for long periods of time without some type of energy loss compensation.
3. Deep cycle batteries should not be used for any engine starting; this type of battery is not designed for this purpose and such activities will easily lead to damage.
4. Undercharging of a battery: to charge a battery, let’s say, 85% of its capacity will allow sulphating of the battery due to the 15% of battery chemistry not reactivated by the incomplete charging cycle. This is also applicable if the battery bank is charged by PV solar panels and a permanent load is drawn from the system. If incorrectly calculated and wrongly designed, the battery or battery set will sit in limbo and never reaches full charge. This will definitely result in relatively quick battery damage.
5. Heat of 35°C or more increases internal discharge. As temperatures increase, so does internal discharge.
6. Low electrolyte level in wet batteries, where internal plates exposed to air, will immediately start the process of sulphation.

Correct Charging of OmniPower OPR Batteries
To take care of your battery, remember you must replace the energy you have used by re-charging the battery immediately; if you don’t, the battery sulphates and that affects performance and longevity. Batteries like to be charged in a certain way, especially when they have been deeply discharged. This type of charging is called 3-step regulated charging. Please note that only special SMART CHARGERS using computer technology can perform 3-step charging techniques. You seldom find these types of chargers in parts stores or discount warehouses. But you WILL find them at Sinetech: click here to browse the battery chargers in stock.

Most batteries have the tendency to discharge themselves by 2 – 4% per month, if they are left disconnected and just standing there. This can be worse if the battery is exposed to extreme temperatures. If you know, that you will not use the battery for a lengthy period of time, try to leave your battery or battery set connected permanently to a float charger. This will help to keep the battery 100% charged as you will replace continually the self-discharge. This also will help not to sulphate your internal plates. The energy usage to do this is minimal.

The first step is bulk charging or constant current stage where up to ~ 80% of the battery energy capacity is replaced by the charger, the charger will charge at the maximum current and maintain this current until the battery voltage reaches the set absorption voltage. Please note, the maximum current and absorption voltage has to be adjusted according to the recommendations of the supplier. If the charger is not programmable, a charger with the correct specifications has to be selected to match the battery specifications.

When the battery voltage reaches the set absorption voltage the charger begins the 2nd step, the absorption charge step. This is where the voltage is held constant, at the absorption voltage, and the current (amps) decline until the battery is ~ 98% charged.

Next comes the 3rd step the Float Step, this is a regulated voltage of not normally not more than 13.6 volts and usually less than 1-2 amp of current. This, in time, will bring the battery to 100% charge or close to it. The float charge will not boil or heat up the batteries but will maintain the batteries at 100% charge and prevent cycling during long term inactivity. Some AGM + Gel batteries may require special settings or chargers.

We recommend for our OPR Series of batteries at least a 3 stage chargers with the capacity to charge the batteries at a minimum current (amps) equal to 20% of the Ah rating of the battery. Which means if you have a 1 x 12V/100Ah battery, the charger should be at least be capable to charge at 14.4V/20 Amps.

Off-grid Solar Kit - 3kVA

R 19,950.00

Out of stock

Off-grid Solar Kit - 3kVA Plus

R 31,122.00 ~~R 32,760.00~~ -5%

Out of stock

Off-grid Solar Kit - 5kVA Plus

R 44,840.00

Out of stock

Off-grid Solar Kit - 5kVA Max

Kodak Hybrid Solar Kit 2.92kWp array/3.5kWh storage/4.6kW max output

Reference: H-4.6-PYLON-3.5-SA

Condition: New product

Solar Electricity & Storage Solution for home or business

Produce 450kWhs (Units) per month

This product is no longer in stock

Notify me when this product is in stock

E-mail

Email

Notify Me

R 92,976.50 tax incl.

-5% ~~R 97,870.00 tax incl.~~

Free Shipping!

Add To Quote

What you should know when dealing with us

SECURE PAYMENTS BY

PayFast

instant EFT

MasterCard

VISA

PYLONTECH



Basic Parameters	US2000B Plus	Phantom-S	US3000
Nominal Voltage（V）	48	48	48
Nominal Capacity (Wh)	2400	2400	3552
Usable Capacity (Wh)	2200	2200	3200
Dimension（mm）	442*410*89	445*428*97.5	442*420*132
Weight（Kg）	24	24	32
Discharge Voltage（V）	45 ~ 53.5	5 ~ 53.5	45~53.5
Charge Voltage（V）	52.5 ~ 53.5	52.5~53.5	52.5~53.5
Charge / Discharge Current（A）	25（Recommended）	25（Recommended）	37 (Recommended)
	50（Max）	50（Max）	74 (Max)
	100（Peak@15s）	100（Peak@15s）	100 (Peak@15s)
Communication Port	RS232，RS485，CAN	RS232，RS485，CAN	RS232，RS485，CAN
Single string quantity(pcs)	8	8	8
Working Temperature/℃	0~50	0~50	0~50
Shelf Temperature/℃	-20~60	-20~60	-20~60
Humidity	5%~85%	5%~85%	5%~85%
Altitude (m)	<2000	<2000	<2000
Design life	10+ Years（25℃/77℉）	10+ Years（25℃/77℉）	10+ Years（25℃/77℉）
Cycle Life	>4500, 25℃	>4500, 25℃	>4500, 25℃
Authentication Level	TÜV / CE / UN38.3	TÜV / CE / UN38.3	TÜV / CE / UN38.3

About Paloma Gas

About Paloma: A World Leader in Gas Appliances

Established in 1911, Paloma began as a private manufacturing company pioneering gas appliances in Japan. Today, the Paloma Group is the world's leading producer of gas and hot water appliances with products spanning over 20 countries across all continents. Paloma products are used globally for domestic, industrial and commercial purposes. From their headquarters in Nagoya Japan, Paloma has sales offices in USA, Australia, Canada, Mexico, New Zealand, China, Singapore and Vietnam, Indonesia, Middle East, Brazil, India and now South Africa.

Global Brands

The Paloma Group manufactures a wide range of gas water heaters, solar water heaters, gas stoves, rice cookers, room heaters, swimming pool & spa heaters, domestic and commercial heaters, warm air furnaces & air conditioners and market these products under the following brands: Paloma, Rheem, Solahart, Rudd, Raypak, & Everhot.

Where Paloma Gas appliances are available, worldwide

Rheem Manufacturing is the largest manufacturer of water heaters in the USA. Rheem is a wholly owned subsidiary of the Paloma Group since 1988 supplying products to New Zealand, Australia, USA, Canada, Mexico, Brazil and Indonesia.

Safety and Development

Paloma takes prides in achieving the highest level of safety engineering in the gas appliance industry. Paloma customises and certifies each of its products to the highest safety standards as required by individual countries supplied. Paloma's substantial annual investment into research & development ensures continual improvements in efficiency and safety are class leading, giving you the best and most reliable technology available in the world.

Integrity & Effort

We work together with our clients in a spirit of integrity, fairness & partnership and guarantee continuity & stability in our business. This means we keep our promises and will not be content with the way things are, continually finding ways to improve innovate and add value to the products we manufacture.

Paloma Gas returns to South Africa providing cutting edge energy efficient products to a market that requires cost savings, reliability and peace of mind. Unlike all other brands, Paloma Engineers have studied the South African climate, water quality and varying altitude demands to produce custom designed gas water heaters for the varying South African marketplace. This will ensure the highest efficiency levels and best product quality demands are met across the country.

Benefits of Gas Water Heating include;

- Unlimited hot water (as long as you have gas)
- Precise control of hot water used (only when you turn the hot tap on does the GWH start producing hot water)
- No hot water is stored (heating on demand)
- Low maintenance
- Low capital outlay
- Can pay for itself in 8-10 months (LPG Installation) or 4-6 months (Natural Gas Installation)
- Compact, small, easy to install
- Can be retrofitted to current hot water systems
- Cost savings in 3 forms; 1) Pay as you use hot water, 2) No storage of hot water, 3) Lower cost of heating water with gas

Under the new 10400xa any new building must have 50% water heated by other means. Installing a GWH can be a much cheaper alternative to meeting this requirement.

Installation and Safety

LPG Gas Installations of Paloma Appliances

All LP gas installations must be carried out by a registered gas fitter according to SANS10087, Natural Gas according to SANS827. A typical LPG installation would require a minimum of 2 x 48kg cylinders with a changeover regulator, connected directly to the gas water heater or geyser (cylinder sizing does need to be correctly specified by your Gas Installer). Natural Gas installers must ensure correct pipe sizing to the unit is adhered to. Paloma units are designed for outdoor use, no additional flues etc are required. For guarantee and customer insurance purposes, every Paloma installed must be accompanied by a Certificate of Conformity (CoC) from a registered installer.

Water piping is very simple, cold water supply with minimum 1bar pressure is needed to supply the

unit. Hot water is then plumbed from the unit into the existing or new reticulation supplying the premises. It is very important to ensure hot water piping is laid efficiently to reduce heat loss factors. The gas geyser units should be installed as close as possible to the point of highest hot water use.

A standard 15amp 3 pin outdoor plug socket is required (units only draw 65watts of power only when operational). Power back-up devices can be installed directly beneath the unit. It may also be advisable to install a surge protected plug on the unit to safeguard from electricity spikes.

Click here to read the Paloma gas geyser installation guide

Appliance Safety

All gas appliances must be tested and certified for use in South Africa according to SANS 1539. Palomas gas geysers have met stringent safety tests in South Africa and around the world, notably in Australia, USA & Europe. Paloma Gas Water Heaters incorporate their patented ICAD device, a sophisticated system that monitors the combustion and ventilation of the unit and will shut down if any problems are detected. South African units are certified for use with both Natural Gas and LPG.

All Gas Water Heaters units have flame failure devices, so gas will not run through the unit if a flame is not burning. Oxygen depletion sensors ensure that gas combusts correctly and that overuse of oxygen does not occur. Paloma gas geysers have

over 20 individual sensors that monitor each stage of gas use, ignition, burning, ventilation and hot water delivery takes place correctly and in its required process. All Paloma units have winter frost-protection as well as anti-boil protection, so that water cannot be super heated to the point that can be dangerous.

Digital controllers are available to be installed in bathrooms or kitchens and allow the user to set maximum output temperatures. This creates greater efficiency as only the precise amount of gas is used to reach preset temperature, and also protects from scalding and hot water burns.

Click here to read the Paloma gas geyser safety instruction booklet.

What to do if you smell gas:

- Turn off gas supply at cylinders or gas meter
- Extinguish all naked flames.
- Do not operate any electrical appliances.
- Ventilate the area.
- Check for leaks as detailed in this manual.

If odour persists, contact your dealer or gas supplier immediately.