



**PowerSpout Features**

Power range	1.0 to 1.2 kW at 12/24/48/120/350-400 VDC. Custom up to 1.6 kW. Up to 16 kW with 10 stacked units.
Head range	3 – 100 m (10 – 330 ft). Custom up to 120 m (400 ft)
Flow range/turbine	0.25-8 Litres/second (5-130 gallons/minute) per turbine
Efficiency	Up to 60% (50-55% typical is application and site dependent)
Warrantee	3 years subject to maintenance procedure in manual

**PowerSpout Specifications**

Generator	3-phase permanent magnet adjustable up to 80% efficient
Voltage	12/24/48dc or any custom voltage up to 400 VDC or VAC
Wattage single	100 - 1200 W standard. Custom up to 1600 W
Wattage stacked (2-10 units)	0.2-12 kW standard. Custom up to 16 kW
Running speed	200 - 1600 rpm
Watt/rpm	0.7 W/rpm standard, 1.0 W/rpm high power version with MPPT (ME and GE only)
Bearings	SKF explorer series sealed front 6005-2Z OD52mm ID25mm and rear 6205-2Z OD47mm ID25mm. Sealed bearings need to be re-greased at times and PowerSpout is equipped with a re-greasing nipple to do this easily.
Regulation	BE-non supplied, voltage limiting regulation for ME and GE turbine supplied
Jets	2 with 10-plastic jet inserts supplied (2-25mm hole size range, easily cut on site).
Shipping weight	Up to 25kg packed weight.
Shipping	Price includes shipping to all global destination, but excludes import duty and local taxes that may apply in your country

**PowerSpout Materials**

Case	LDPE
Pelton rotor	GF30 Nylon 230mm PCD
Pelton spoons	GF30 Nylon
Drive shaft	stainless steel
All fasteners and fixings	stainless steel
Recycled content	up to 68% (refer to environmental report for specific details)

**PowerSpout Pelton wheel**

Number of spoons	20
Pelton spoon width	70mm
Length of spoon	62mm
Maximum jet diameter	25mm
Hub thickness	17mm
Hub fixing hole	12mm
Outside diameter	290mm
Running diameter	230-240mm

## PowerSpout versions

If you intend to have a grid connection then you should select PowerSpout GE. If you are off-grid your initial choice is largely related to the cable length (distance from generator to batteries/load), since cable costs can be significant at low voltages. The ME turbine is self-optimising, so is often the preferred choice even on short cable lengths. The optimal distance for each PowerSpout version is given in Table 1.

**Table 1. Different versions of PowerSpout**

PowerSpout Version	Description	Cable length (m) approx.	Features
BE	Battery Enabled	0 - 250	Connected directly to a battery bank with a diversion load controller for system regulation.
ME 100	MPPT Enabled	50 - 750	Designed for inverters and MPPT regulators operating at less than 100 V DC (120 ELV *) or for the Latronic grid-tied inverters that are made in Australia.
ME 120	MPPT Enabled	50 - 1000	Connected to a battery bank through a MPPT controller such as the Outback FM60. Designed for inverters and MPPT regulators operating at less than 120 V DC (120 ELV *)
ME 140	MPPT Enabled	50 - 1500	Connected to a battery bank through a MPPT controller such as the Outback FM60. Designed for inverters and MPPT regulators operating at less than 140 V DC.
ME 250	MPPT Enabled	50 - 2000	Connected to a battery bank through a MPPT controller such as the Midnite Classic 250. Designed for inverters and MPPT regulators operating at less than 250 V DC.
GE 400	Grid Enabled	0 - 2000	Connected to a grid tied inverter to feed power into the national grid or for use in mini grids via Sunny Island type inverters. Designed for inverters operating at less than 400 V DC.
HE (NZ only)	High-voltage Enabled	500 - 2000	Connected directly to a battery bank via three step-down transformers with a diversion load controller for system regulation.
DE	Dealer Enabled	N/A	Non-working dealer sample for display purposes, only available to our approved dealer network
EE	Education Enabled	N/A	Educational turbine, only available to education providers.

\*120 ELV (extra low voltage) laws in some countries allow home owners to install equipment up to 120 V DC without regulatory control applying to them.

There are numerous PowerSpout resources available from the website [www.powerspout.com](http://www.powerspout.com) including

- All product and installation manuals. Prospective buyers need to read the manuals prior to purchase. Manuals are not supplied with the product.
- Advanced Calculator. Cable and pipe sizes, type/number of turbines and power output can be determined for your site using the online calculator. A manual for the calculator is also online giving instructions and worked examples
- Photos and videos: turbines, parts, assembly and maintenance tasks and much more
- How to order (summary): All PowerSpout generators are optimized for **your site data**. Customers wishing to order a PowerSpout need to submit site data by using the Advanced Calculator or completing the site data table in this guide. Your dealer will help you place your order.

Complete turbines	
 <p>Front view</p>  <p>Side and back view</p>  <p>With manifold fitted</p>	<p><b>PowerSpout BE</b>  <b>Power range 100 to 1200 Watts per unit at 12/24/48 V DC</b>  <b>High power version up to 1600 Watts at 48 V DC</b>  <b>Shipping weight up to 25 kg</b></p> <p>The PowerSpout BE is the most cost effective turbine in the product range. It is a durable domestic scale hydro turbine that can be stacked up to 10 units. The rugged fully enclosed design makes it ideal for remote properties and developing countries.</p> <p>The BE turbine is intended for use with a 12/24/48 VDC battery bank, external diversion regulator and inverter system. For grid connect applications refer to our GE turbine.</p> <p>PowerSpout BE is well suited to sites where the turbine is in close proximity to the point of power consumption so that cable distance (hence cost) is not significant and where maximum power point tracking and data logging is not required.</p> <p>To reduce cable costs and for ease of installation the PowerSpout ME is often a good choice.</p>
	<p><b>PowerSpout ME 100</b>  <b>Power range 100 to 1200 Watts per unit at 100 V DC</b>  <b>High power version up to 1600 Watts</b>  <b>Shipping weight up to 25 kg</b></p> <p>The PowerSpout ME 100 is a durable domestic scale hydro turbine that can be stacked up to the capacity of the inverter – normally 1-2 units</p> <p>This product is intended for use with a 12/24/48 V DC battery bank, a maximum power point (MPP) regulator and inverter system. The MPP regulator must be able to handle an input voltage up to 100 V DC such as the Latronics PV Edge 1200 inverters.  <a href="http://www.latronics.com.au/pvspecs.php">http://www.latronics.com.au/pvspecs.php</a></p> <p>The ME 100 product is well suited to sites where the turbine is distant to the point of power consumption. It is fitted with a 100 V DC voltage controller so that it cannot produce more than 100 V DC. This ensures it meets the ELV requirements in many European, Australasian and Asian countries. It has an internal diversion regulator that operates at 95 V DC and in the event of element failure the regulator shorts the generator preventing it from causing overvoltage damage to the attached inverter.</p> <p>This is a special order product and a delay of several weeks can be expected.</p>



Front view



Side and back view



With manifold fitted

**PowerSpout ME 120**

**Power range 100 to 1200 Watts per unit at 120 V DC**

**High power version up to 1600 Watts**

**Shipping weight up to 25 kg**

The PowerSpout ME 120 is a durable domestic scale hydro turbine that can be stacked up to 10 units. It is ideally suited for developed and developing countries where the hydro turbine is up to 1000m (3300ft) from where the power is used as it operates at a higher voltage than PowerSpout BE.

The ME 120 turbine is intended for use with a 12/24/48 V DC battery bank, a maximum power point (MPP) regulator and inverter system. The MPP regulator must be able to handle an input voltage up to 120 V DC such as the Outback FM60. This turbine is used in markets with 120 VDC ELV laws.

The ME 120 turbine can also be used for grid connect applications where the inverter can operate at up to 120 V DC.

The ME 120 product is well suited to sites where the turbine is distant to the point of power consumption. It is fitted with 120 VDC voltage controller so that it cannot produce more than 120 VDC. This ensures it meets the 120 VDC ELV requirements in many European, Australasian and Asian countries. It has an internal diversion regulator that operates at 115 V DC and in the event of element failure the regulator shorts the generator preventing it from causing overvoltage damage to attached equipment.



**PowerSpout ME 140**

**Power range 100 to 1200 Watts per unit at 140 V DC**

**High power version up to 1600 Watts**

**Shipping weight up to 25 kg**

The PowerSpout ME 140 is a durable domestic scale hydro turbine that can be stacked up to 10 units

The ME 140 turbine is intended for use with a 12/24/48 V DC battery bank, a maximum power point (MPP) regulator and inverter system. The MPP regulator must be able to handle an input voltage up to 140 V DC such as the Outback FM60. The ME 140 operates at close to the 150 VDC limit of common MPPT regulators

The ME 140 turbine can also be used for grid connect applications where the inverter can operate at up to 140 V DC.

The ME 140 product is well suited to sites where the turbine is distant to the point of power consumption. It is fitted with 140 VDC voltage controller so that it cannot produce more than 140 VDC. This ensures it is compatible with many common MPPT regulators on the market. It has an internal diversion regulator that operates at 135 VDC and in the event of element failure the regulator shorts the generator preventing it from causing overvoltage damage to attached equipment.

This is a special order product and a delay of several weeks can be expected.



**PowerSpout ME 250**  
**Power range 100 to 1200 Watts per unit at 250 V DC**  
**High power version up to 1600 Watts**  
**Shipping weight up to 25 kg**

The PowerSpout ME 250 is a durable domestic scale hydro turbine that can be stacked up to 10 units

The ME 250 turbine is intended for use with a 12/24/48 V DC battery bank, a maximum power point (MPP) regulator and inverter system. The MPP regulator must be able to handle an input voltage up to 250 V DC such as the Midnite Classic 250. The ME 250 operates at close to the 250 VDC limit of this MPPT regulator.

The ME 250 turbine can also be used for grid connect applications where the inverter can operate at up to 250 VDC.

The ME 250 product is well suited to sites where the turbine is distant to the point of power consumption. It is fitted with 250 V DC voltage controller so that it cannot produce more than 250 V DC. It has an internal diversion regulator that operates at 240 VDC and in the event of element failure the regulator shorts the generator preventing it from causing overvoltage damage to attached equipment.

This is a special order product and a time delay of several weeks can be expected.



Front view



Side and back view



With manifold fitted

**PowerSpout GE 400**  
**Power range 250 to 1200 Watts per unit at 350 V DC**  
**Shipping weight up to 25 kg**

The PowerSpout GE 400 is a durable domestic scale hydro turbine that can be stacked up to 10 units. It is ideally suited for developed and developing countries where the hydro turbine is grid connected or connected via an inverter in an off-grid mini-island system.

The GE 400 turbine is intended for use with a grid-connect inverter with maximum power point tracking (MPPT). The inverter must be able to handle an input voltage up to 400 VDC. Such inverters are commonly available around the world.

The GE product is well suited to sites where the turbine is distant from the grid as it operates at 350 VDC nominal. It is fitted with a 400 VDC voltage controller so that it cannot produce more than 400 VDC. This ensures it will not cause overvoltage damage to the connected inverter. In the event of regulator/element failure the regulator shorts the generator preventing it from causing overvoltage damage to attached equipment.

 <p>Front view</p>  <p>Side and back view</p>  <p>With manifold fitted</p>	<p><b>PowerSpout HE (only available in NZ)</b>  <b>Power range 100 to 1200 Watts per unit at 350 V AC</b>  <b>Shipping weight up to 40 kg</b></p> <p>The PowerSpout HE is a durable domestic scale hydro turbine that cannot be stacked.</p> <p>You would only use the HE turbine if an ME turbine cannot be economically deployed due to high cable costs. The HE turbine is sometimes used to replace old defunct equipment where a small 3-phase cable is already installed. We rarely recommend this turbine option for new installations.</p> <p>On new installations it more cost effective to use the ME or GE turbines and low cost 2-core aluminium wire.</p> <p>The HE product is well suited to sites where the turbine is distant from the grid as it operates at up to 500 VAC 3-phase (350 VAC typical). It is supplied with a step down transformer and rectifier. The output is suitable for charging 12/24/48 vdc off grid battery based systems in the same manner as our BE turbine, external voltage regulation is required.</p>
 <p>Front view</p>  <p>Side and back view</p>	<p><b>PowerSpout EE</b>  <b>Power range 10 to 20 Watts per unit at 12 V DC</b>  <b>Shipping weight up to 25 kg</b></p> <p>The PowerSpout EE is education enabled. Its outward appearance is the same as a BE turbine.</p> <p>This product is designed to run off a domestic water supply driving a small 12 volt light.</p> <p>This product is only available to educational providers and dealers.</p>
	<p><b>PowerSpout High Power upgrade up to 1 W/rpm</b>  <b>This upgrade can lift performance of some turbines to 1.6 kW @ 1600 rpm</b></p> <p>Most PowerSpout turbines can be upgraded to our high power version that can increase power output per turbine by up to 30%. You might do this in situations where the Advanced Calculator advises 2 turbines but you only need 1.3 turbines.</p>

PowerSpout Dealer Promotional Products	
 <p>Front view</p>  <p>Side and back view</p>	<p><b>PowerSpout DE</b>  <b>Shipping weight up to 20 kg</b></p> <p>The PowerSpout DE is a dealer enabled sample. Its outward appearance is the same as a fully working BE turbine. Some parts are missing and a non-working generator is fitted for safety. The back cover and generator can be easily removed to show potential clients how the unit works.</p> <p>Parts missing include:</p> <ul style="list-style-type: none"> <li>• Front glazing and fixings</li> <li>• Internal lubrication system and rectifier</li> <li>• Low quality bearings installed (not SKF)</li> <li>• Slinger seals</li> <li>• Plug connector and flex</li> <li>• 1 jet - single jet supplied</li> </ul> <p>This product is only available to approved PowerSpout dealers.</p>
 <p>Front view</p>  <p>Side and back view</p> 	<p><b>PowerSpout DE Shell and display Pelton</b>  <b>Shipping weight up to 20kg</b></p> <p>The PowerSpout DE Shell is a dealer enabled sample. Its outward appearance is the same as a fully working BE turbine. In this option the generator is missing, this frees up room in the airfreight carton to include 2 display Pelton units. For shows where the internal generator is of little value, dealers will prefer this option. Also much lighter to carry around with the generator missing.</p> <p>Parts missing include:</p> <ul style="list-style-type: none"> <li>• Front glazing and fixing</li> <li>• Internal lubrication system and rectifier</li> <li>• Low quality bearings installed (not SKF)</li> <li>• Slinger seals</li> <li>• Plug connector and flex</li> <li>• 1 jet - single jet supplied</li> <li>• Generator</li> </ul> <p>This product is only available to approved PowerSpout dealers.</p>
	<p><b>PowerSpout Display Pelton</b>  <b>Shipping weight 1.5kg</b></p> <p>Glass filled nylon Pelton rotor mounted on a display base with the text "PowerSpout.com". For display purposes only.</p> <p>This promotional product is great for dealers and for hydro industry award trophies. Our PowerSpout Pelton rotor is used on our turbines and is made available to our dealer network at a great price as a display item or a gift for your agents or clients.</p>

	<p><b>Set of 12 PowerSpout Display Boards</b>  <b>Shipping weight 20kg</b></p> <p>This product is available to dealers to assist in promoting the PowerSpout brand with real world examples. These images can also be downloaded for free from the dealer section of our web site for printing at your end.  Warning - file sizes are very large.</p> <p>This product is only available to approved PowerSpout dealers.</p>
<p align="center"><b>PowerSpout Accessories</b></p>	
	<p><b>Manifold</b>  <b>Shipping weight 5kg</b></p> <p>This 2-jet manifold is made from 75mm OD PVC pipe (65mm ID) and is rated for 100m head. It is the quickest and tidiest way to connect your pipe line to your new PowerSpout.</p> <p>The connector on the end of the manifold is supplied as an extra and the size of this depends on the pipe size you have used in your installation. We can supply the correct pipe connector for your manifold and turbine to ensure your install gets off to a good start.</p>
	<p><b>Tool Kit</b>  <b>Shipping weight 1.0kg</b></p> <p>Remember to order a tool kit with your new PowerSpout turbine, it comes with:</p> <ul style="list-style-type: none"> <li>• Knife for jet sizing</li> <li>• Taper gauge for jet sizing</li> <li>• Small adjustable spanner</li> <li>• 8,10,11,12 mm socket drives</li> <li>• Pencil</li> <li>• General screw driver bits</li> <li>• Plumbing thread sealing tape</li> <li>• Spare bearing sets (non SKF)</li> <li>• Large Jet spanner</li> <li>• Optimization packing washers for BE turbine</li> </ul>
	<p><b>Clamp meter</b>  <b>Shipping weight 2.0kg</b></p> <p>Nobody living off the grid on a battery based inverter system should be without a DC clamp meter.  It has both 40 and 400 amp DC scales plus all the normal features of a multi-meter</p> <p>Full specifications at <a href="http://www.ageta.hu/pdf/UT203204.pdf">http://www.ageta.hu/pdf/UT203204.pdf</a></p>

PowerSpout Common Spare Parts	
	<p><b>PowerSpout complete spare parts kit</b>  <b>Shipping weight 13kg</b></p> <p>If you order a complete spare parts kit at the same time you order your PowerSpout turbine we will ship it for no extra charge. If ordered after your turbine has been a shipped an extra freight charge will apply.</p> <p>This spare parts kit includes all the spare parts for your turbine as shown in the picture (excludes ME/GE circuit boards and resistive element).</p>
	<p><b>ME voltage limiting circuit board</b>  <b>Shipping weight 2.0kg</b></p> <p>This voltage limiting circuit board is designed to fit inside the PowerSpout ME turbine to limit its maximum operating voltage to less than specified for each version.</p> <ul style="list-style-type: none"> <li>• ME 100 designed for MPPT regulators that have a 100 VDC upper limit or for the Latronic grid-tied inverters that are made in Australia.</li> <li>• ME 120 limits the output to below 120 V DC which complies with ELV rules in many countries.</li> <li>• ME 140 operates at close to the upper limit of 150 VDC common MPPT regulators</li> <li>• ME250 operates at close to the upper limit of the 250 VDC Midnite Classic 250 MPPT regulator.</li> </ul> <p>This circuit board takes 3-phase AC, converts it to DC and limits the output to the set limit. Once the limit is reached some of the load is diverted the hot water element which is cooled by the turbine’s exhaust water.</p> <p>The board is plastic coated for insulation, water and vibration protection.</p> <p>Should the system go down, the load is removed from the turbine and the voltage will instantly climb. Just below the set voltage limit an internal dump load is turned on to hold the voltage constant. In the event of a regulator failure a failsafe “crowbar” activates at the set limit by applying a direct short to the generator to drop the voltage to zero. These boards must be used with the correct ME water load (1500W element at 120 VDC) and is suitable for turbines up to 1.5kW at 120 VDC and above.</p> <p>The ME 250 is fitted with a 1500 W element at 240 V DC, the same element used on the GE 400 turbine.</p> <p>The circuit board must be mounted inside the turbine (or close to the turbine if you are making your own) to avoid inductive issues associated with long DC cable runs. Turbine exhaust water is used to cool the dump load.</p> <p>Can be used with 3-phase permanent magnet generators with a maximum output of 1.5kW and with a MPPT voltage of 60-250 VDC.</p>

	<p><b>PowerSpout ME diversion load</b>  <b>Shipping weight 1.0kg</b></p> <p>Diversion load for use with the ME 100, ME 120 and ME 140 circuit boards. These are 120 V DC 1500 Watt, 1" NPT elements.</p>
	<p><b>GE voltage limiting circuit board</b>  <b>Shipping weight 2.0kg</b></p> <p>This voltage limiting circuit board is designed to fit inside the PowerSpout turbine to limit the maximum operating voltage of the GE 400 turbine to be always less than 400 vdc.</p> <p>This circuit board takes 3-phase AC, converts it to DC and limits the output to 380 V DC, at which point some of the load is diverted to the hot water element which is cooled by the turbine's exhaust water.</p> <p>The board is plastic coated for insulation, water and vibration protection.</p> <p>Should the grid go down, the load is removed from the turbine and the voltage will instantly climb. At 380 V DC an internal dump load is turned on to hold the voltage constant. In the event of a regulator failure a failsafe activates at 400 V DC that applies a direct short to the generator to drop the voltage to zero. This board must be used with the GE water load and is suitable for turbines up to 1.6 kW operating at a nominal voltage of 350 V DC into a grid tied inverter.</p> <p>The circuit board must be mounted inside (or close to the turbine if you are making your own) to avoid inductive issues associated with long DC cable runs. Turbine exhaust water is used to cool the dump load.</p> <p>Can be used with 3-phase permanent magnet generators (PMGs) with a maximum output of 1.6kW and with a MPPT voltage of 250-350 V DC</p>
	<p><b>PowerSpout GE diversion load</b>  <b>Shipping weight 1.0kg</b></p> <p>Diversion load for use with the GE circuit board. These are 240 V DC 1500 Watt, 1" NPT elements.</p>
	<p><b>Bearing block and shaft complete</b>  <b>Shipping weight 2kg</b></p> <p>This part enables you to do a quick bearing swap in the event of a bearing failure or just to speed up the service time part your turbine. This is the minimum you should buy at the same time you purchase your PowerSpout, as we can ship it for free at the same time as your turbine.</p> <p>This inexpensive assembly is also commonly used by DIY'ers making their own turbines with Smart Drive PMGs.</p>

	<p><b>Shaft and rotor fixing</b>  <b>Shipping weight 2kg</b></p> <p>Shaft damage is the one thing that can stop you from getting your turbine back in service again fast. The shaft is 25mm OD stainless and is also commonly used by DIY'ers when making their own turbines with Smart Drive PMG's.</p>																				
	<p><b>SKF front and back bearings</b>  <b>Shipping weight 0.5kg</b></p> <p>Top quality SKF explorer series sealed bearings, front 6205-2Z OD 52mm ID 25mm and rear 6005-2Z OD 47mm ID 25mm. Sealed bearings do need to be re-greased at times as hydro turbines run 24/7 and see very high cycle rates. The PowerSpout is provided with a re-greasing nipple so this can be easily done with the turbine in operation. Refer to manual for re-greasing schedule. Lower quality and cost bearings can be used where the turbine is operating at powers below 500W and 1000 rpm.</p>																				
	<p><b>Chinese front and back bearings</b>  <b>Shipping weight 0.5kg</b></p> <p>Chinese sealed bearings, front 6205-2Z OD 52mm ID 25mm and rear 6005-2Z OD 47mm ID 25mm. Sealed bearings do need to be re-greased at times as hydro turbines run 24/7 and see very high cycle rates. The PowerSpout is provided with a re-greasing nipple so this can be easily done with the turbine in operation. Refer to manual for re-greasing schedule. Lower quality and cost bearings like these can be used where the turbine is operating at power below 500W and 1000 rpm.</p>																				
	<p><b>Glass filled nylon Pelton rotor</b>  <b>Shipping weight 2.0kg</b></p> <p>Our PowerSpout Pelton rotor is used on all our turbines but also by many DIY'ers around the world building their own hydro turbines and for educational use in schools and universities.</p> <p><b>Specifications:</b></p> <table data-bbox="544 1563 1193 1921"> <tr> <td>Typical efficiency</td> <td>80% (depends on application)</td> </tr> <tr> <td>Number of spoons</td> <td>20</td> </tr> <tr> <td>Pelton spoon width</td> <td>70mm</td> </tr> <tr> <td>Length of spoon</td> <td>62mm</td> </tr> <tr> <td>Maximum jet diameter</td> <td>25mm</td> </tr> <tr> <td>Hub thickness</td> <td>17mm</td> </tr> <tr> <td>Hub fixing hole</td> <td>12mm</td> </tr> <tr> <td>Outside diameter</td> <td>290mm</td> </tr> <tr> <td>Running diameter</td> <td>230-240mm</td> </tr> <tr> <td>Maximum power</td> <td>1600W on 2 jets at 1600 rpm</td> </tr> </table>	Typical efficiency	80% (depends on application)	Number of spoons	20	Pelton spoon width	70mm	Length of spoon	62mm	Maximum jet diameter	25mm	Hub thickness	17mm	Hub fixing hole	12mm	Outside diameter	290mm	Running diameter	230-240mm	Maximum power	1600W on 2 jets at 1600 rpm
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	<p><b>PowerSpout glazing</b>  <b>Shipping weight 1.0kg</b></p> <p>Has the glazing for your PowerSpout got damaged, scratched or lost. Well buy a new one.</p>
	<p><b>PowerSpout Spare Pelton spoons – 20 pack</b>  <b>Shipping weight 1.0kg</b></p> <p>Need a new set of GF30 Nylon Pelton spoons for you rotor? Spoons have been endurance tested at 120m of head, wear rate will depend on the grit and silt load in your streams. Generally these spoons will last 3-10 years and are very cost effective. Often metal spoons will not last any longer.</p>
	<p><b>PowerSpout Jet Pack – 5 jets</b>  <b>Shipping weight 0.5kg</b></p> <p>If you need more jets, these jets inserts are for hole sizes from 2-30mm.</p> <p>NB: The jets for our green case hydro are different, order green case hydro jets. If you have made your own hydro turbine and cannot remember which type you ordered please note:</p> <ul style="list-style-type: none"> <li>• The PowerSpout jets face mount on the jet holder</li> <li>• The Green case type fit into a recessed diameter in the jet holder</li> </ul>
	<p><b>PowerSpout Pelton fixings</b>  <b>Shipping weight 0.5kg</b></p> <p>These hub plate 20 x M5 stainless steel fixings lock the hub plates and spoons together.</p>
	<p><b>PowerSpout Hub plates -2 pack</b>  <b>Shipping weight 0.5kg</b></p> <p>These hub plates lock either side of our Pelton spoons providing a strong and lightweight hub. Made from GF30 nylon. Central fixing hole is 12mm. Hub plates are held in place with 20 x M5 stainless steel fixings (not supplied).</p>
	<p><b>PowerSpout Jet kit</b>  <b>Shipping weight 2.0kg</b></p> <p>This Jet kit comprises:</p> <ul style="list-style-type: none"> <li>• 50mm BSP PVC ball valve (or 2" NPT)</li> <li>• Jet cap</li> <li>• 5 Jets</li> <li>• Jet sleeve</li> <li>• 'O' ring seal</li> </ul> <p>Please note 2" BSP valves will be sent unless you state otherwise in your order notes</p>

	<p><b>PowerSpout Seal Kit</b>  <b>Shipping weight 0.5kg</b></p> <p>This seal kit includes:</p> <ul style="list-style-type: none"> <li>• Top cap shield</li> <li>• Tap cap galvanised washer</li> <li>• Top cap rubber gasket</li> <li>• 2 x shaft slinger rings</li> <li>• 4 stainless steel fixings with nylon head seals</li> </ul>
	<p><b>PowerSpout Pressure gauge</b>  <b>Shipping weight 0.5kg</b></p> <p>Pressure gauges are supplied in both kPa and PSI scales. Gauges are available in 100, 200, 500, 750, 1000 and 2000 kPa ranges and their equivalent PSI scales. All gauges are oil filled stainless steel construction with a 1/4 inch BSP parallel threaded fitting.</p>

Smart Drive Generator Parts	
	<p><b>Smart Drive stators standard series</b> 4 kg</p> <p>Fully reconnected to suit your application, generally they are capable of up to 0.7W/rpm in the voltage range 12-500 up to 1200Watts. Will operate with type 1 or type 2 rotors.</p> <ul style="list-style-type: none"> <li>• 100-14S-1P star or delta</li> <li>• 100-7S-2P star or delta</li> <li>• 100-2S-7P star or delta *</li> <li>• 80-14S-1P star or delta</li> <li>• 80-7S-2P star or delta</li> <li>• 80-2S-7P star or delta*</li> <li>• 60-14S-1P star or delta</li> <li>• 60-7S-2P star or delta</li> <li>• 60-2S-7P star or delta*</li> </ul>
	<p><b>Smart Drive stators cog free series</b> 4 kg</p> <p>Fully reconnected to suit your application, generally they are capable of up to 0.7W/rpm when fitted with a type 3 rotor and in the voltage range 24-500 up to 1200 Watts and cog free.</p> <p>Capable of up to 1.0W/rpm when fitted with a type 4 high power rotor and in the voltage range 24-500 up to 1600 Watts and cog free.</p> <ul style="list-style-type: none"> <li>• 60dc-12S-1P star or delta</li> <li>• 60dc-6S-2P star or delta</li> <li>• 60dc-4S-3P star or delta</li> <li>• 60dc-3S-4P star or delta</li> <li>• 60dc-2S-6P star or delta*</li> <li>• 60dc-1S-12P star or delta*</li> <li>• 60dc-12S-1P star or delta*</li> <li>• 60dc-12S-1P star or delta*</li> </ul>
	<p><b>Smart Drive Rotor type 1</b> 2 kg</p> <p>This older type rotor has a similar magnet strength of the type 2 that replaced it, but has a more 'coggy' action.</p> <p>This type 1 rotor is commonly used on all the 60, 80 and 100 series stators. Do not use it on the 60dc series it will not work.</p>

	<p><b>Smart Drive Rotor type 2</b>  <b>2 kg</b></p> <p>This type 2 rotor is commonly used on all the 60, 80 and 100 series stators. Do not use it on the 60dc series it will not work.</p>
	<p><b>Smart Drive Rotor type 3</b>  <b>2 kg</b></p> <p>This type 3 rotor is commonly used on all the 60dc series stators. Do not use it on the 60, 80 and 100 series it will not work.</p>
	<p><b>Smart Drive Rotor type 4 high power</b>  <b>2 kg</b></p> <p>This type 4 rotor is commonly used on all the 60dc series stators. Do not use it on the 60, 80 and 100 series it will not work. This rotor can results in up to 1W/rpm of output.</p>
<p><b>PowerSpout BE Regulation</b></p>	
	<p><b>60 amp regulator</b>  <b>Shipping weight 2.0kg</b></p> <p>Powermaster 60 amp diversion regulator.          A great unit for 12/24/48 VDC operation for solar PV, hydro and wind.</p> <p>For full specifications refer to <a href="http://www.powermaster.com.tw/PM-SCC-60AP-1248.htm">http://www.powermaster.com.tw/PM-SCC-60AP-1248.htm</a></p>
	<p><b>Air diversion load</b>  <b>Weight 4kg</b></p> <p>Diversion load for use with diversion load regulator or for solid state DC relays via FM60/80's.</p> <p>Specifications:          48 VDC          30-35 amp</p> <p>Specials diversion loads can be made on request to suit your voltage and diversion amps for an extra charge.</p>
	<p><b>Air diversion load</b>  <b>Weight 2kg</b></p> <p>Diversion load for use with diversion load regulator or for solid state DC relays via FM60/80's.</p> <p>Specifications:          12VDC or 24 VDC          30-35 amp</p>

 	<p><b>BE Regulation Air Kit 48 V DC</b>  <b>Weight 3kg</b></p> <p>When you order your BE turbine, we can fit a 60 amp regulator and the resistive wire for making your own diversion element in the same box as your BE turbine. Hence we can deliver it for no extra freight charge.</p> <p>Included:</p> <ul style="list-style-type: none"> <li>• 60 amp regulator</li> <li>• Resistive wire x 2 for 48 VDC operation</li> <li>• Bulk head insulators x 2 (2 x red and 2 x black)</li> </ul> <p>Not included:</p> <ul style="list-style-type: none"> <li>• Casing (as shown in picture)</li> <li>• Protective grill (as shown in picture)</li> </ul> <p>You can make you own enclosure like the one pictured by buying a suitable sized stainless steel roasting dish and a cooling rack that fits over the top.</p> <p>After you have assembled your resistive element, up you must test it by connecting it directly to your battery banks and checking that if draws 30-35 amps at your fully charged battery voltage. Once tested you can connect it to your regulator that will be good for:</p> <p style="text-align: center;">1440 Watts of a 48 VDC battery</p>
 	<p><b>BE Regulation Air Kit 12/24 V DC</b>  <b>Weight 3kg</b></p> <p>When you order your BE turbine, we can fit a 60 amp regulator and the resistive wire for making your own diversion element in the same box as your BE turbine. Hence we can deliver it for no extra freight charge.</p> <p>Included:</p> <ul style="list-style-type: none"> <li>• 60 amp regulator</li> <li>• Resistive wire (12/24) VDC operation</li> <li>• Bulk head insulators x 2 (red and black)</li> </ul> <p>Not included:</p> <ul style="list-style-type: none"> <li>• Casing (as shown in picture)</li> <li>• Protective grill (as shown in picture)</li> </ul> <p>You can make you own enclosure like the one pictured by buying a suitable sized stainless steel roasting dish and a cooling rack that fits over the top.</p> <p>After you have assembled your resistive element, up you must test it by connecting it directly to your battery banks and checking that if draws 30-35 amps at your fully charged battery voltage. Once tested you can connect it to your regulator that will be good for:</p> <p style="text-align: center;">360 Watts of a 12 VDC battery  720 Watts of a 24 VDC battery</p>

 <p>The image shows two components: a 'Power Master' 60 amp regulator with a digital display and a 'BE Regulation Water Kit' which consists of a stainless steel heating element with two legs and electrical wiring.</p>	<p><b>BE Regulation Water Kit 12/24/48 V DC</b>  <b>Weight 5kg</b></p> <p>When you order your BE turbine and a water element in the same box as your BE turbine. Hence we can deliver it for no extra freight charge.</p> <p>Included:</p> <ul style="list-style-type: none"> <li>• 60 amp regulator</li> <li>• Resistive water element</li> </ul> <p>Specifications:</p> <ul style="list-style-type: none"> <li>• 1.25 inch BSP thread</li> <li>• 12, 24 or 48 VDC from the same element</li> <li>• Use a single leg for 24 VDC - so have a spare</li> <li>• Use both legs in series for 48 VDC</li> <li>• Use both legs in parallel for 12 VDC</li> <li>• 30-35 amp</li> </ul> <p>Good for:</p> <p>360 Watts of a 12 VDC battery          720 Watts of a 24 VDC battery          1440 Watts of a 48 VDC battery</p>
 <p>The image shows a 'Water Diversion element', which is a stainless steel heating element with two legs and electrical wiring, similar in design to the BE Regulation Water Kit.</p>	<p><b>Water Diversion element</b>  <b>Weight 2kg</b></p> <p>Diversion load for use with pulse width modulation (PWM) type diversion load regulators or for solid state DC relays via FM60/80's.</p> <p>Specifications:</p> <ul style="list-style-type: none"> <li>• 1.25 inch BSP thread</li> <li>• 12, 24 or 48 VDC from the same element</li> <li>• Use a single leg for 24 VDC - so have a spare</li> <li>• Use both legs in series for 48 VDC</li> <li>• Use both legs in parallel for 12 VDC</li> <li>• 30-35 amp</li> </ul>
<p align="center"><b>PowerSpout ME Regulation</b></p>	
 <p>The image shows an Outback FM60 charge controller, a black rectangular device with a digital display and ventilation slots.</p>	<p><b>Outback FM60</b>  <b>Weight 5kg</b></p> <p>Plug your PowerSpout ME directly into an Outback FM60, no other regulation needed. If you want to divert your surplus power to hot water you will need a solid state diversion relay and suitable hot water element.</p> <p>Your PowerSpout ME is limited to 100/120 or 140 VDC maximum open circuit voltage and has a failsafe system to prevent overvoltage conditions. Connects to your FM60 in the same manner as a PV panel.</p> <p>Full specifications at:  <a href="http://www.outbackpower.com/products/charge_controllers/flexmax/">http://www.outbackpower.com/products/charge_controllers/flexmax/</a></p>

	<p><b>Outback FM80</b> <b>Weight 5kg</b></p> <p>Plug your PowerSpout ME directly into an Outback FM80, no other regulation needed. If you want to divert your surplus power to hot water you will need a solid state diversion relay and suitable hot water element.</p> <p>Your PowerSpout ME is limited to 100/120 or 140 VDC maximum open circuit voltage and has a failsafe system to prevent overvoltage conditions. Connects to your FM80 in the same manner as a PV panel.</p>
	<p><b>Solid state DC relay 60 amp</b> <b>Weight 1kg</b></p> <p>This solid state relay can be used with an FM60/80 to divert surplus DC power from a wind or hydro turbine to a diversion load element. This diversion load can be an air or water element.</p> <p>Unit is supplied in a plastic case mounted to a large heat sink. The device uses the 12 v AUX relay function in your FM60/80 to automatically control surplus power.</p> <p>Specifications: Control signal voltage 3-32VDC Output 12-60VDC at up to 60 amps (peak).</p> <p>We advise you do not connect to resistive element that draws more than 30-35 amps when connected to your battery.</p> <p>Resistive load supplied separately. Manual is supplied with this product advising how to install and use it with the FM60/80 product.</p>
	<p><b>AC relay 10 amp</b> <b>Weight 0.5kg</b></p> <p>This AC 10 amp relay can we used with an FM60/80 to divert surplus AC power from your inverter to a diversion water pump, water heater or other useful load.</p> <p>Unit is supplied mounted in a plastic case. The device uses the AUX relay function in your FM60/80 to automatically control surplus power.</p> <p>Specifications: Control signal voltage 12VDC Output switching 100-250 VAC – 10 amps maximum Both normally open and normally closed contacts</p> <p>Can also be used with reverse logic to bring on the grid power when your batteries are low via a suitable step down transformer and rectifier set so the input voltage is less that 120 VDC for ELV input to your FM60/80.</p>