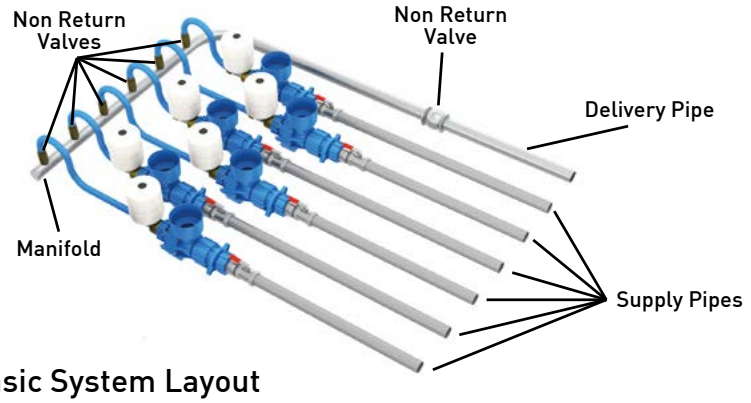
Papa Multi-Pump Systems

If your supply flow is large and you need more water delivered, you can use a multi pump system.

A number of pumps can be installed in parallel with delivery via a manifold. This allows for continuous operation during servicing, flexibility during low flows, and the use of a single delivery pipe.

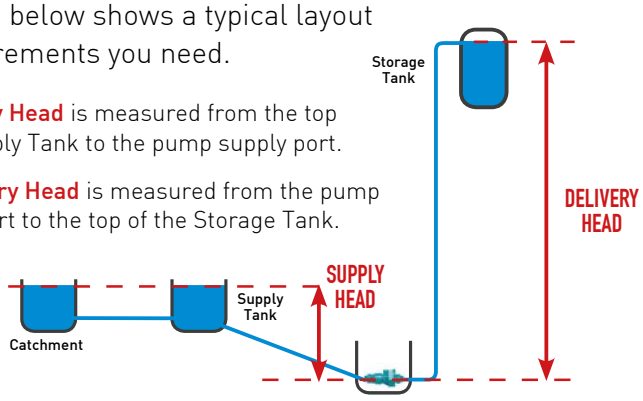


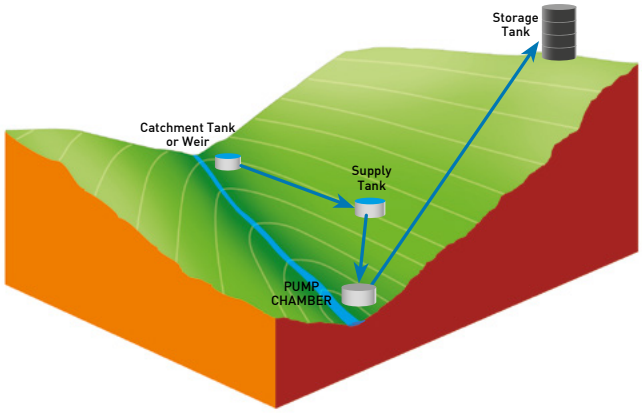
Basic System Layout

To calculate your water delivery, you will need to know the height of your Supply Head and the Delivery Head. The graphic below shows a typical layout and measurements you need.

The **Supply Head** is measured from the top of the Supply Tank to the pump supply port.

The **Delivery Head** is measured from the pump delivery port to the top of the Storage Tank.





FAQs

Do you do different sized pumps?

We do one size pump because it is designed to be modularly expandable to suit your water needs - if circumstances change and you need more water, you just add more pumps to your system.

Is it more difficult to maintain?

On the contrary. Papa pumps are designed to work 24/7, so you can change valves on one pump while the others provide continuous water delivery.

Won't it multiply the infrastructure costs?

Not really. Compared to a single pump system, a multi pump system can use the same number of tanks, the same lengths of feed and delivery pipe - you would just need more lengths of supply pipe and a few more connectors.

Is there a discount for more than one pump?

There are economies of scale, for instance, on shipping costs - contact WPT for package deals.

Why not just buy a Venturo Pump?

The Venturo is concept project designed for large agricultural and industrial applications and only sold as part of a water system. Multi-pump systems are more suitable to farmers and individuals with high water use.

Multi Pump Water Delivery Example:

10 Papa Pump system

600 litres per minute supply flow

Supply Head = 6 metres / Delivery Head = 12 metres

Water Delivery: 260,000 litres per day

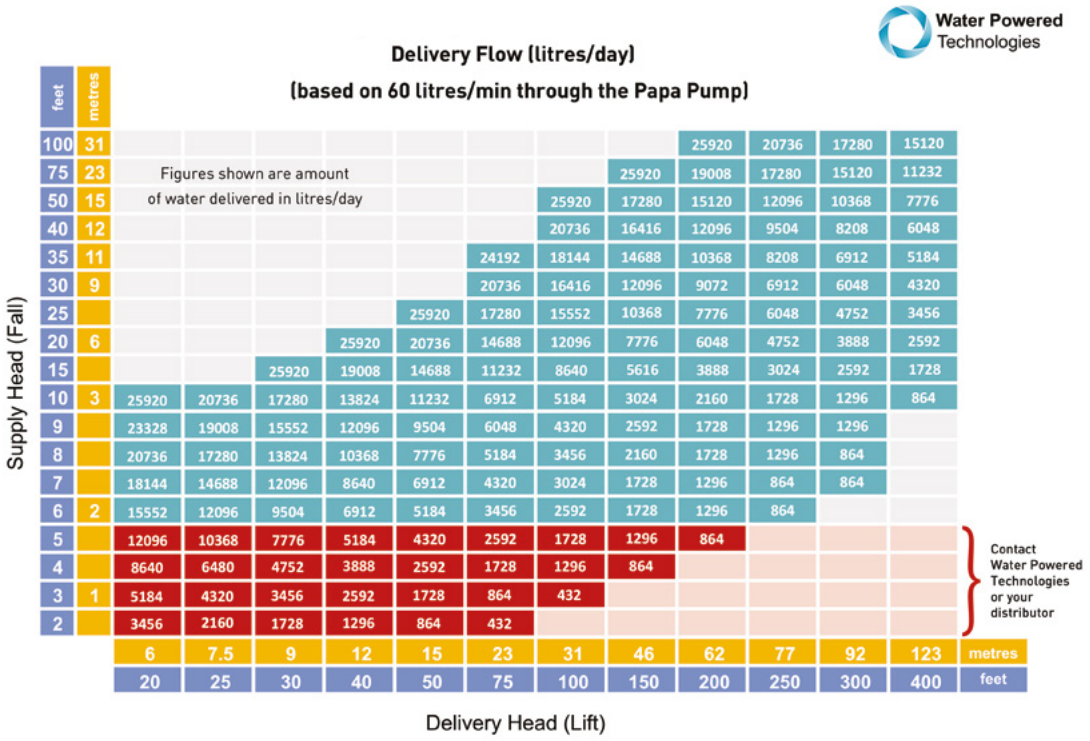
Applications:

Small to medium agriculture - Livestock Watering and Irrigation.
Off Grid water systems and Micro Hydro Generation.
Humanitarian Projects and Community Water supplies.
Small/med scale Commercial - e.g. Golf Courses, Fisheries, etc.

And if you need even more water for commercial projects or large scale water systems, contact us about the Venturo™

The Venturo is known as the 'largest ram pump in the world' and is designed for large partnership projects such as large plantations, mining operations, waste water schemes and hydro generation. It is not sold individually as a pump but as part of commercial project or large scale water system. For more information...
www.waterpoweredtechnologies.com/venturo

Papa Pump Performance Chart for Single Papa Pump



Estimating the delivery flow for Multi Pump Systems

To estimate your delivery flow, use the chart above and multiply the stated delivery flows by the number of pumps in your system. The table below illustrates some examples.

Supply Head (metres)	Delivery Head (metres)	Delivery Amount (litres per day)									
		1 Pump	2 Pumps	3 Pumps	4 Pumps	5 Pumps	6 Pumps	7 Pumps	8 Pumps	9 Pumps	10 Pumps
1	6	5184	10368	15552	20736	25920	31104	36288	41472	46656	51840
1	12	2592	5184	7776	10368	12960	15552	18144	20736	23328	25920
1	31	432	864	1296	1728	2160	2592	3024	3456	3888	4320
2	6	15552	31104	46656	62208	77760	93312	108864	124416	139968	155520
2	12	6912	13824	20736	27648	34560	41472	48384	55296	62208	69120
2	31	2592	5184	7776	10368	12960	15552	18144	20736	23328	25920
2	77	864	1728	2592	3456	4320	5184	6048	6912	7776	8640
3	6	25920	51840	77760	103680	129600	155520	181440	207360	233280	259200
3	12	13824	27648	41472	55296	69120	82944	96768	110592	124416	138240
3	31	5184	10368	15552	20736	25920	31104	36288	41472	46656	51840
3	77	1728	3456	5184	6912	8640	10368	12096	13824	15552	17280
6	12	25920	51840	77760	103680	129600	155520	181440	207360	233280	259200

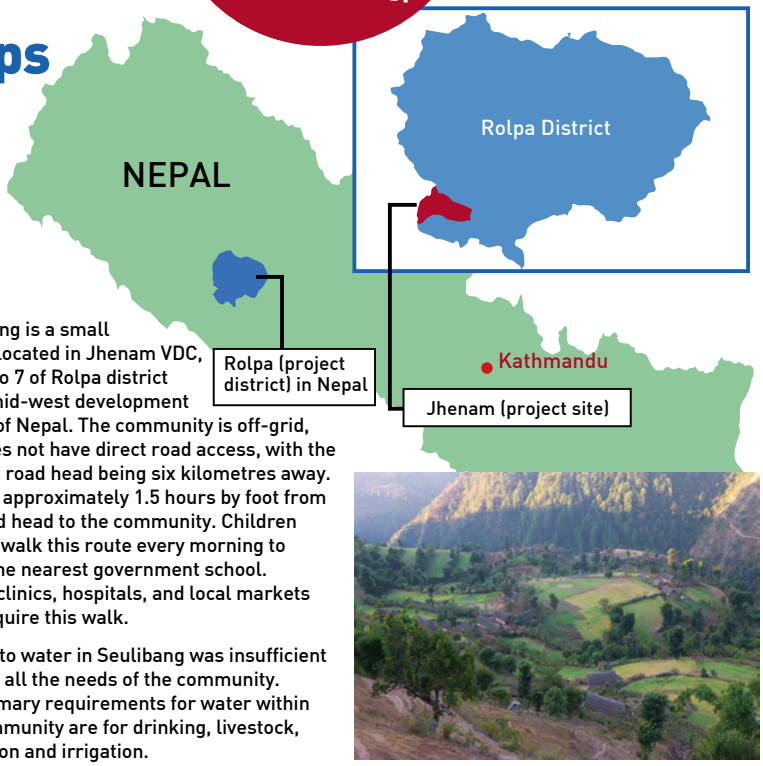
Supply Head (metres)	Delivery Head (metres)	Delivery Amount (litres per day)									
		1 Pump	2 Pumps	3 Pumps	4 Pumps	5 Pumps	6 Pumps	7 Pumps	8 Pumps	9 Pumps	10 Pumps
6	31	12096	24192	36288	48384	60480	72576	84672	96768	108864	120960
6	77	4752	9504	14256	19008	23760	28512	33264	38016	42768	47520
6	123	2592	5184	7776	10368	12960	15552	18144	20736	23328	25920
9	31	16416	32832	49248	65664	82080	98496	114912	131328	147744	164160
9	77	6912	13824	20736	27648	34560	41472	48384	55296	62208	69120
9	123	4320	8640	12960	17280	21600	25920	30240	34560	38880	43200
12	31	20736	41472	62208	82944	103680	20736	41472	62208	82944	103680
12	77	9504	19008	28512	38016	47520	57024	66528	76032	85536	95040
12	123	6048	12096	18144	24192	30240	36288	42336	48384	54432	60480
23	77	17280	34560	51840	69120	86400	103680	120960	138240	155520	172800
23	123	11232	22464	33696	44928	56160	67392	78624	89856	101088	112320
31	62	25920	51840	77760	103680	129600	155520	181440	207360	233280	259200

Water Powered Technologies

CASE STUDY | Mountain Village Water Supply | Nepal

Water supplied by Papa Pumps meets community needs and increases agricultural productivity.

Renewable World
TACKLING POVERTY THROUGH RENEWABLE ENERGY



Seulibang is a small village located in Jhenam VDC, Ward No 7 of Rolpa district in the mid-west development region of Nepal. The community is off-grid, and does not have direct road access, with the nearest road head being six kilometres away. It takes approximately 1.5 hours by foot from the road head to the community. Children have to walk this route every morning to reach the nearest government school. Health clinics, hospitals, and local markets also require this walk.

Access to water in Seulibang was insufficient to meet all the needs of the community. The primary requirements for water within the community are for drinking, livestock, sanitation and irrigation.

Renewable World is a registered charity which tackles poverty using renewable energy. We support the provision of affordable renewable energy services to improve incomes, health and education in the developing world. **www.renewable-world.org**

Agriculture is the major source of income for the Seulibang community. Due to the scarcity of water, and dependence on rain fed irrigation, households are only able to grow vegetables during the rainy season, which lasts between four to six months. During the rest of the months families rely on lentils, rice, and dried vegetables. The village has one accessible water source for drinking water and also a stream which flows in the valley. This source of water is accessed for sanitation purposes and livestock. There is no water source suitable for irrigation. Although the community does not have access to a reliable water source for irrigation, the project found many households to be very much active and interested in growing vegetables for their own consumption and also for sale. The stress on living conditions and opportunities for income has led to increased migration especially with the young and working sector.

Why use Papa Pumps?

Renewable World targeted to install one Hydraulic Ram Pump as a renewable water pumping system. Previous experience with ram pumps showed that the efficiency of the system significantly reduced when the delivery head exceeded 100m. Therefore, this technical solution was deemed to be inadequate. Following consultation with Water Powered Technologies who are specialists in zero energy water pumping solutions, they were assured that a Papa Pump system would provide a flow of around 18,000 litres per day.

Access to a reliable source of water for irrigation provided households with the opportunity to grow cash crops during the dry seasons. The increase in crop production for home consumption and for sale has led to improved household incomes throughout the year and could lead to a decrease in out-migration within the community.

Advantages of a Papa Pump System...

- Uses no fuel or electricity
- Pumps water 24/7
- Very low maintenance
- Light and Portable
- Easy Installation
- Ready for Self Installation
- No CO_2 emissions

Water Powered Technologies

CASE STUDY | Large Devon Dairy Farm Multi-Pump | UK

Dairy Farm Saves over £30,000/year with Multi-Pump System

The Maristow Estate on the edge of Dartmoor was heavily reliant on mains supply to water their herd of 450 Holstein Friesian Dairy Cows which produce 4 million litres of milk per year.

The farm had plenty of water in the Tavy Valley below, but needed it up at the farm on top of the hill. They decided to put in a 6 pump system using the zero energy Papa Pump pumping water from the natural springs on their farm. The pumps used the natural power of flowing water to pressurise a portion of the flow which can then be pushed over a large distance and up to impressive heights. They used 2 pump chambers in the valley with 3 pumps in each, delivering water up to the farm.

The 6 pumps were able to deliver 14,400 cubic metres per year and save the farm over £30,000 on their annual mains water bill, which paid for the full installation within 3 years. The farm also used solar powered pumps to push the water through UV filters to kill any bugs - again at no extra running cost.

You would expect the local water company to be disappointed with the loss in revenue, but in fact South West Water positively encourage it with their 'Upstream Thinking' programme. If they can encourage farmers to keep livestock out of watercourse, the quality of water will improve and they will spend less on treating the water for human consumption and it also helps the environment.

There are 450 Holstein Friesian Dairy Cows on the Maristow Estate

The large water tank at the farm is constantly supplied by the Papa Pumps.

Water is captured high on the hill where there are natural springs.

Installing the supply pipe from the supply tank to the pump chamber.

3 Papa Pumps with delivery ports connected to one delivery pipe.

The Farmer's View...

"Dairy Farming consumes a huge amount of water in milk production and it represents a very big saving for us if we can use our natural resources to reduce our reliance on mains water.

I think that in the future, there will be greater demands on water supplies in the country and if we can use our natural resources on the estate, it's got to be good for the environment and our business."

John Allen - Maristow Farm Manager

Papa Pump®

the pump that uses no fuel!

Water Powered Technologies

www.waterpoweredtechnologies.com