

Kaplan PIT

Runner Blades.... 3 or 4
Head..... 1.5 to 12 meters (5 to 39.5 feet)
Flow..... 15 to 150 cms (530 to 5340 cfs)
Power Output.... 400 kW to 8 MW
Transmission..... Belt Drive or Parallel Gearbox

Vertical Kaplan

Runner Blades.... 4, 5 or 6
Head..... 1.5 to 35 meters (5 to 115 feet)
Flow..... 3.5 to 200 cms (124 to 7060 cfs)
Power Output.... 70 kW to 20 MW
Transmission..... Direct Drive, Belt Drive or Parallel Gearbox

Kaplan Bulb

Runner Blades.... 3 or 4
Head..... 1.5 to 12 meters (5 to 39.5 feet)
Flow..... 5 to 45 cms (180 to 1590 cfs)
Power Output.... 100 kW to 3 MW
Transmission..... Direct Drive, Belt Drive or Bevel Gearbox

Kaplan Z

Runner Blades.... 4, 5 or 6
Head..... 2 to 35 meters (6.5 to 115 feet)
Flow..... 2 to 60 cms (70 to 2120 cfs)
Power Output.... 30 kW to 20 MW
Transmission..... Direct Drive

Kaplan S

Runner Blades.... 4 or 5
Head..... 1.5 to 15 meters (5 to 50 feet)
Flow..... 1.2 to 14.5 cms (43 to 512 cfs)
Power Output.... 20 kW to 1750 kW
Transmission..... Direct Drive or Belt Drive



Mavel Kaplan Turbines

The Mavel Kaplan Turbine

The Kaplan turbine was invented in 1912 by Victor Kaplan in the Czech Republic city of Brno. This turbine gained widespread popularity due to its high efficiency over a wide range of site conditions. Over the last 100 years, a variety of Kaplan turbine configurations have been developed. These include the Kaplan PIT, Vertical, Bulb, Z and S turbines.

Mavel's line of Kaplan turbines are designed for run-of-river powerplants with heads up to 35 meters. A number of turbine configurations ensure an effective solution for specific site conditions. Mavel's Kaplan turbines have three to six runner blades and can be single or double regulated. There are almost 300 Mavel Kaplan turbines installed at sites around the world.

The Mavel Kaplan turbine's features include:

- power output up to 20 MW
- wicket gate adjustment
- runner blade adjustment
- vertical and horizontal configurations
- robust construction
- short delivery times
- proven performance



Mavel Kaplan Bulb Turbine

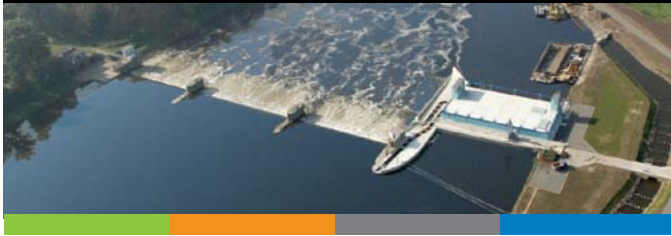
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LOVOSICE HPP

Located on the Elbe River close to Mavel's headquarters in Benešov, Czech Republic, Lovosice HPP has a watertight powerhouse and a fish friendly design.

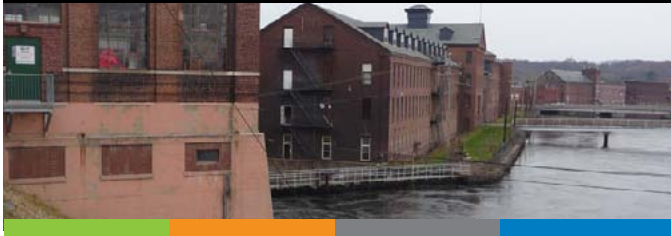


Lovosice HPP Parameters

Turbine.....	4 x Kaplan PIT
Head.....	1.9 meters (6.23 feet)
Flow.....	160 cms (5650 cfs)
Total Power Output.....	2.6 MW

BOATLOCK HPP

Located in Massachusetts, USA, Boatlock HPP is a retrofitted facility that has increased its energy production threefold with Mavel equipment.



Boatlock HPP Parameters

Turbine.....	1 x Vertical Kaplan
Head.....	6 meters (20 feet)
Flow.....	13.2 cms (467 cfs)
Total Power Output.....	704 kW

GRODNENSKAYA HPP

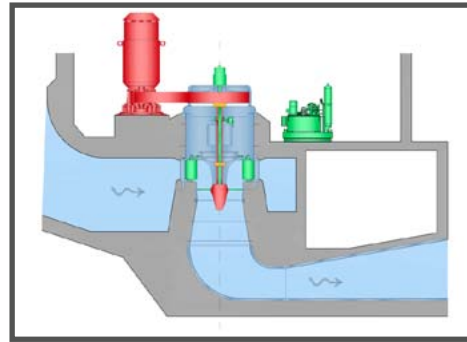
Located in the Republic of Belarus, Grodnenskaya HPP is one of Mavel's largest projects, using five Kaplan PIT turbines for installed power of 18.9 MW.



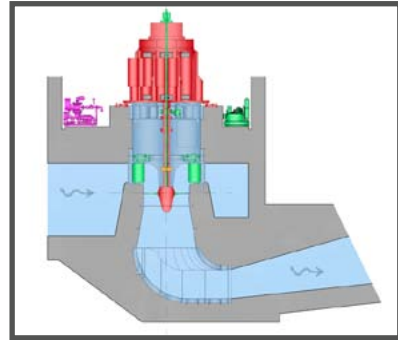
Grodnenskaya HPP Parameters

Turbine.....	5 x Kaplan PIT
Head.....	7 meters (23 feet)
Flow.....	300 cms (10,594 cfs)
Total Power Output.....	18.9 MW

Vertical Kaplan



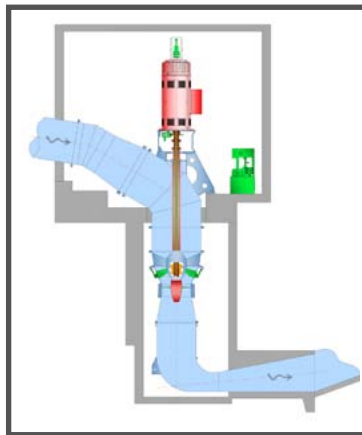
Vertical Kaplan with Belt Drive



Vertical Kaplan with Direct Connection

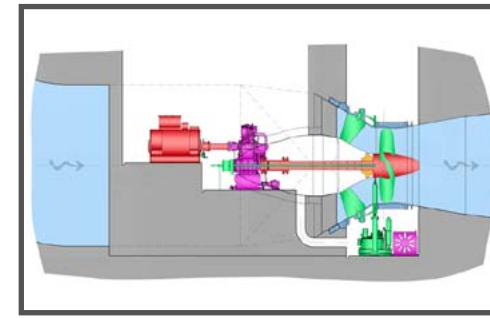
Vertical Kaplan turbines are versatile and can operate under a wide range of site conditions. Mavel's Vertical Kaplan turbines have runner diameters from 850 mm to 5500 mm and power output of 70 kW to 20 MW. These turbines are suitable for both low and high flows and higher heads.

Kaplan Z



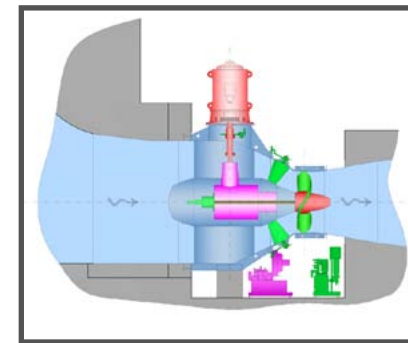
The 'Z' configuration is best suited for turbine replacements or installations where space is limited and there is low to moderate head and flow. Mavel's Kaplan 'Z' turbines have runner diameters of 710 mm to 3000 mm and power output from 30 kW to 20 MW.

Kaplan PIT



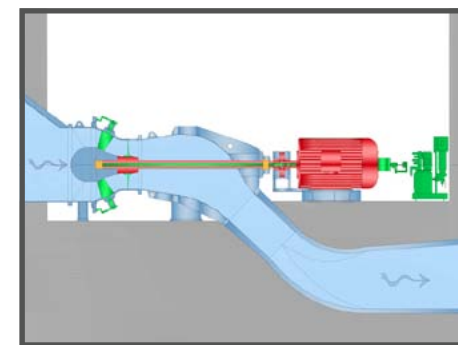
The Kaplan PIT configuration is best suited for low head and high flow conditions. Mavel's Kaplan PIT turbines have runner diameters of 1050 mm to 5500 mm and produce 400 kW to 8 MW of power.

Kaplan Bulb



This turbine configuration is best suited for low head and moderate flow and can be attached to the generator via either belt drive or a gearbox. Kaplan Bulb runner diameters are 1050 mm to 2500 mm. Power output is 100 kW to 3 MW.

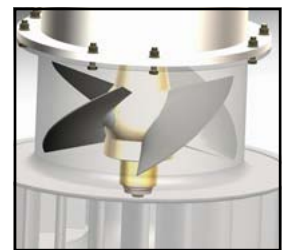
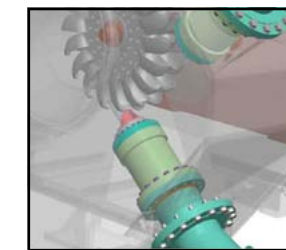
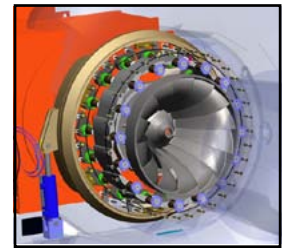
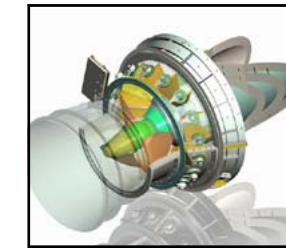
Kaplan S



The 'S' design is best suited for turbine replacement and flows up to 14.5 cms (512 cfs). Kaplan 'S' runner diameters are 560 mm to 1450 mm and power output is 20 kW to 1750 kW.

Hydro Turbine Technology by Mavel

Mavel is a global leader in the supply of Kaplan, Francis, Pelton and modular micro turbines and related equipment for hydroelectric power plants utilizing turbines from 30 kW to 30+ MW.



Founded in 1990, Mavel was one of the first companies formed under the new Czech Commercial Code. The company moved from Prague to its current headquarters in Benešov, CZ in 1993 and brought in a consortium of American / Canadian / European investors in 1997. Funds were used to upgrade facilities and purchase a small hydro turbine producer near Brno, CZ. The original founders of the company remain top managers with their American counterparts and are supported by a team of global hydroelectric power specialists.

Mavel produces turbines at its two 12,900 m² combined manufacturing facilities which have 85 ton crane capacity, and 40 machines including a 5-axis milling machine and a new 6-axis prototype machining center put into operation in 2013.

The Company is ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 and ISO 3834-2:2005 certified.

Over the past twenty five years, Mavel has installed or signed contracts for over 500 turbines at more than 300 sites in 43 countries around the world.