Micro and mini hydro turbine introduction

Jack Chen

2011.11

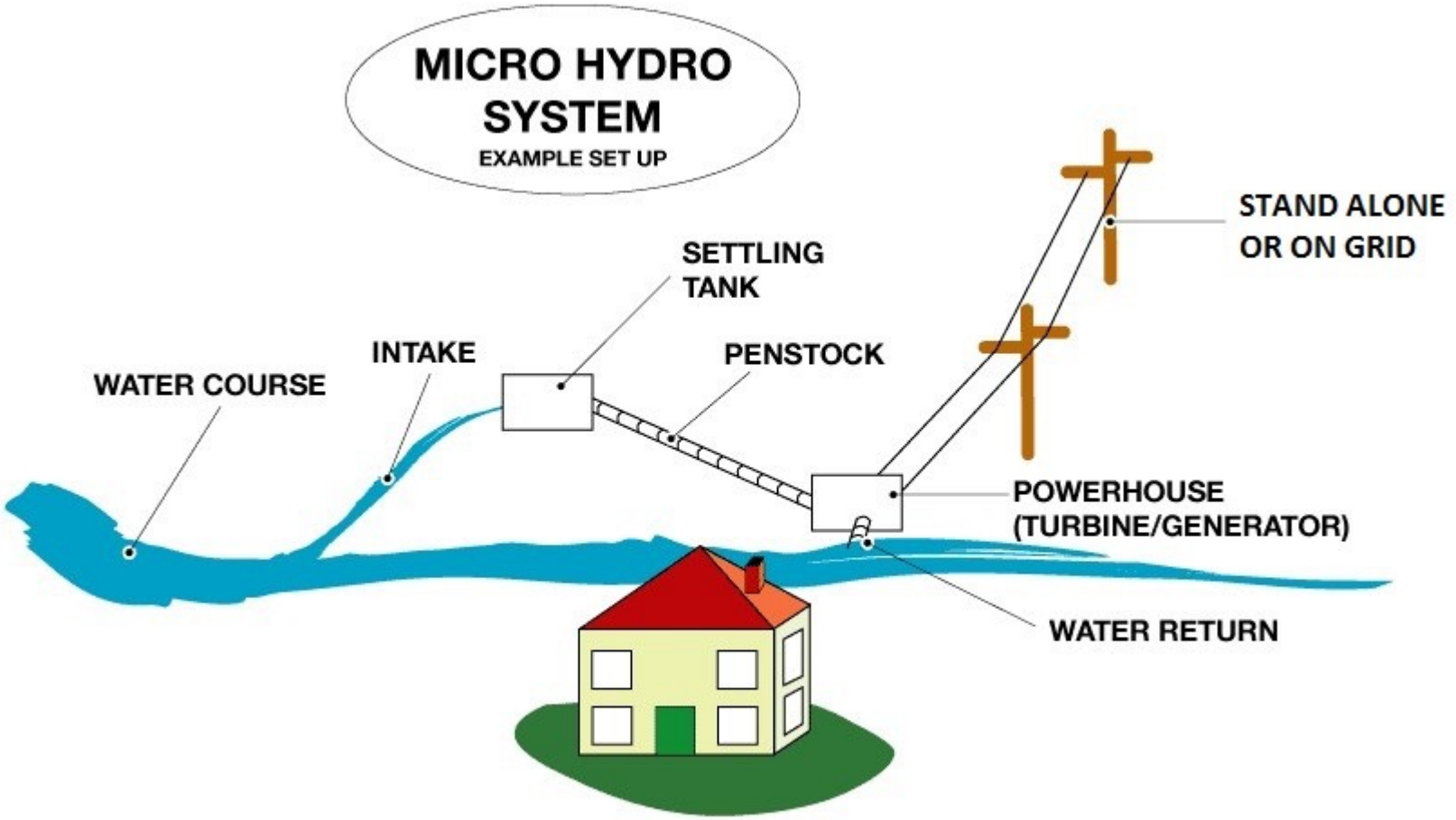
Contents

- Company introduction
- Micro hydro turbine units (0.3kW- 0.1MW)
- Mini hydro turbine units (100kW-3MW)
- Solar home lighting for remote areas

SUNTC HYDRO is devoted to supply kinds of micro & mini hydro turbine units ranges from 0.3KW to 1000KW, and also could offer EPC service (Engineering & Procurement & Construction) in Africa and Asia areas.

We are involved in hydro power business for more than 20 years and export hundreds of units to oversea markets including Francis, England, Sweden, Norway, Latvia, USA, Congo, Burundi, Peru, Brazil, Vietnam, PNG etc. countries.

SUNTC HYDRO also provide solar home lighting system for remote areas where limited in hydropower application.



Run-of River micro hydro power plant

Micro Turgo turbine

Micro Turgo turbine has the key feature of simple structure, small size, light weight, high efficiency, easy install and reliable perform. It is very suitable for small load in mountain areas off grid system.

Single nozzle Turgo turbine

Dual nozzle Turgo turbine

Main specification

Model	Head	Discharge	Generator	Speed	Pipe Dia.	Weight
	(m)	(m^3/s)	(KW)	(r/min)	(mm)	(kg)
XJ14-0.3DCT4-Z	12-14	0.003-0.005	0.3	1500	50	25
XJ18-0.5DCT4-Z	12-18	0.005-0.007	0.5	1500	50-75	27
XJ18-0.75DCT4-Z	14-18	0.005-0.008	0.75	1500	75	34
XJ25-1.5DCT4-Z	18-25	0.008-0.011	1.5	1500	125	70
XJ25-1.5DCTH4-Z	15	0.012-0.018	1.5	1500	125-150	108
XJ25-3.0DCT4-Z	25-35	0.015-0.019	3	1500	125-150	90
XJ25-3.0DCTF4-Z	18-20	0.018-0.030	3	1500	150	122
XJ28-6.0DCT4/6-Z	28-35	0.030-0.038	6	1500	150-200	196
XJ28-6.0DCTF4/6-Z	18-20	0.038-0.050	6	1000	200	255
XJ30-10DCT4-Z	30-38	0.040-0.050	10	1500	200-250	269
XJ30-10DCTF4/6-Z	25-30	0.050-0.060	10	1000	200-250	318
XJ30-12SCTF4-Z	28-35	0.050-0.060	12	1500	200-250	325
XJ30-15SCTF4/6-Z	30-40	0.060-0.070	15	1500/1000	200	395
XJ30-20SCTF4/6-Z	30-45	0.060-0.100	20	1500/1000	250-300	380
XJ38-30SCTF4/6-Z	38-45	0.090-0.120	30	1500/1000	250-300	530

Micro Tubular turbine

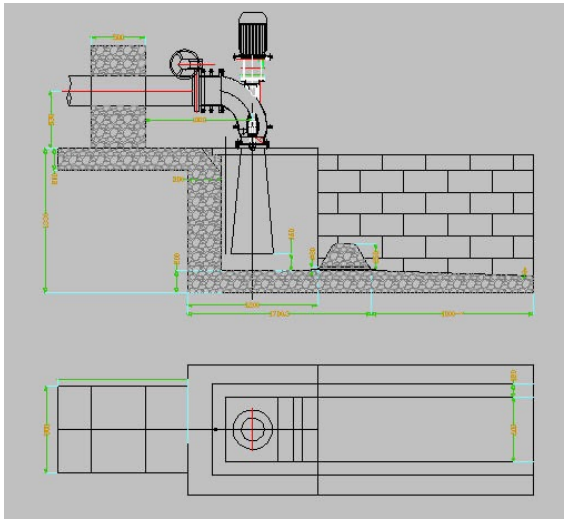
The micro Tubular turbine is mainly composed of flume, runner, distributor, tailrace and generator etc. parts. It is appropriate for application in pladces of low head and large flow rate.

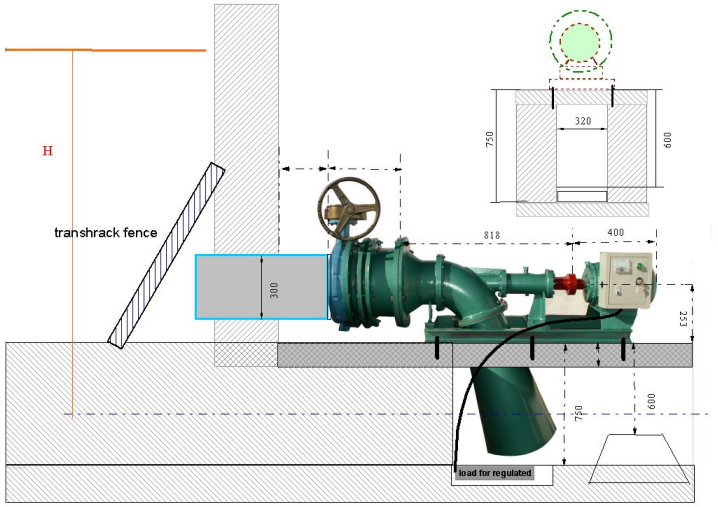
Vertical Tubular turbine

Horizontal Tubular turbine

Main specification

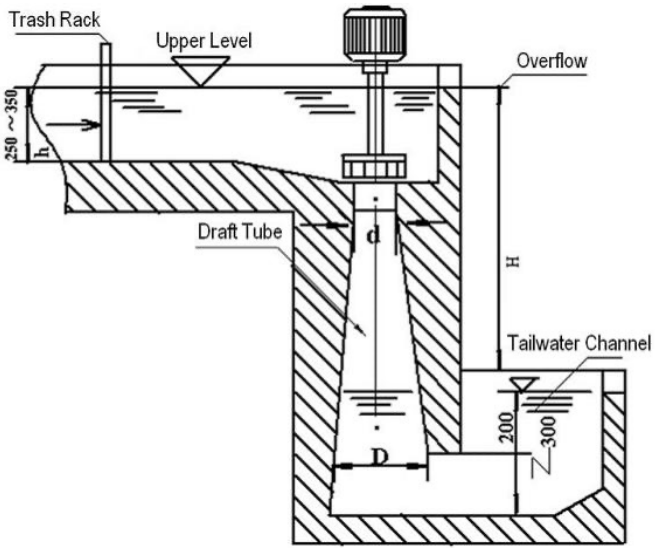
Model	Head	Discharge	Generator	Speed	Pipe Dia.
	(m)	(m^3/s)	(KW)	(r/min)	(mm)
GD-LZ-12-3KW	11	0.045	3	1500	150
GD-LZ-20-3KW	4	0.136	3	1000	250
GD-LZ-20-6KW	7	0.156	6	1500	300
GD-LZ-20-8KW	9	0.161	8	1500	300
GD-LZ-20-10KW	11	0.165	10	1500	300





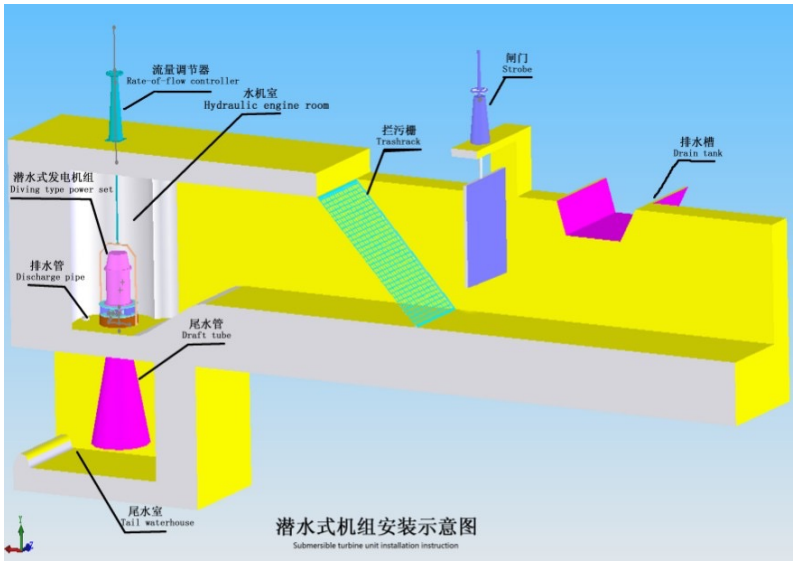
Micro Propeller Turbine

The micro Propeller turbine is consist of PMG and vertical shaft turbine, the turbine will be installed into the volute chamber. It has compact structure, attractive apperarance and no need the excitation device.



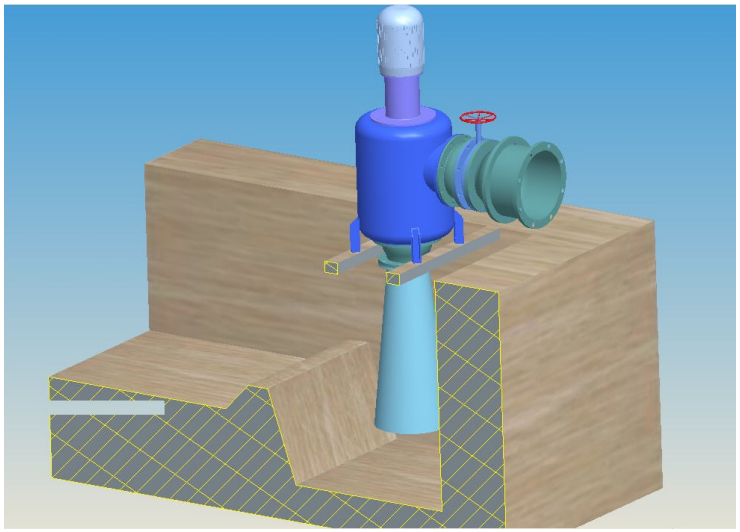
Submersible turbine

The submersible turbine is a new model based on Propeller turbine, which is cooperated with EDF in 2004. It has been developed successfully and could be used in Europe mills well.



Barrel turbine

The Barrel turbine is also developed from micro Propeller turbine, much more easy to install and simple to maintains thought cost is bit higher. Below is the sample unit used in USA market.

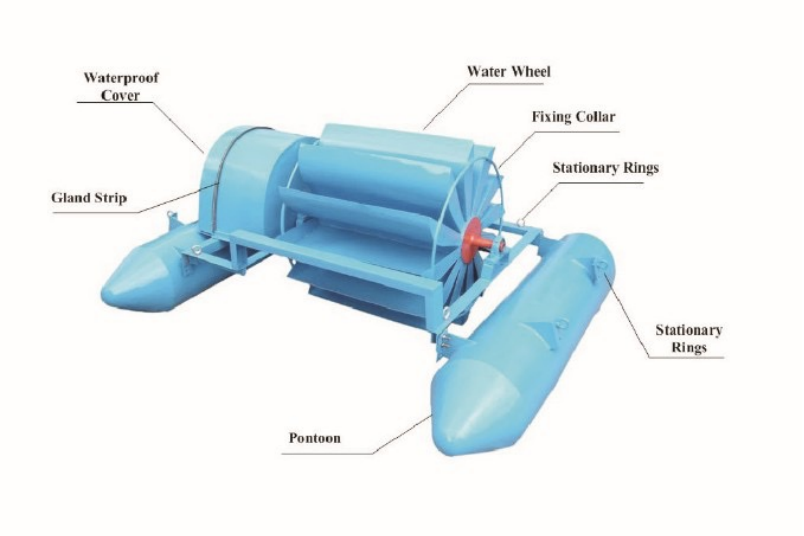


Cross flow Turbine

The cross flow turbine is mainly used in low and medium head, the turbine speed is very low and drive by belt pulley. The overall efficiency is bit lower than others.

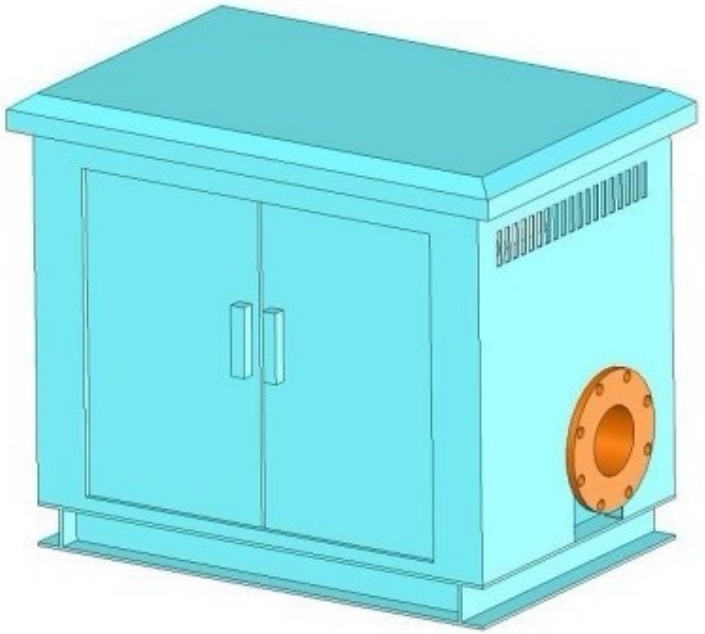
Float bucket turbine

The float bucket turbine is suitabel for high flow without water head, it is a fish frendly turbine design, but the turbine volume is bit large and transport cost is bit high.



Micro hydro Box station

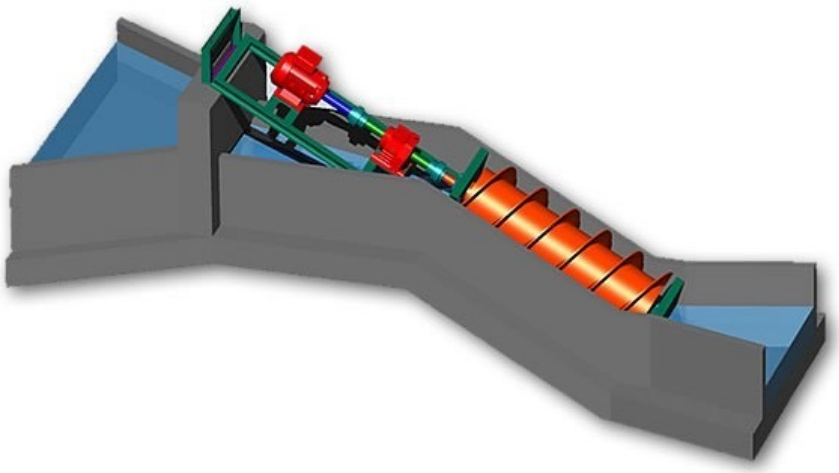
The micro hydro box station is our new design for micro hydro, it no need to build extra power station for our hydro turbine and only connect the pipe with our connector.

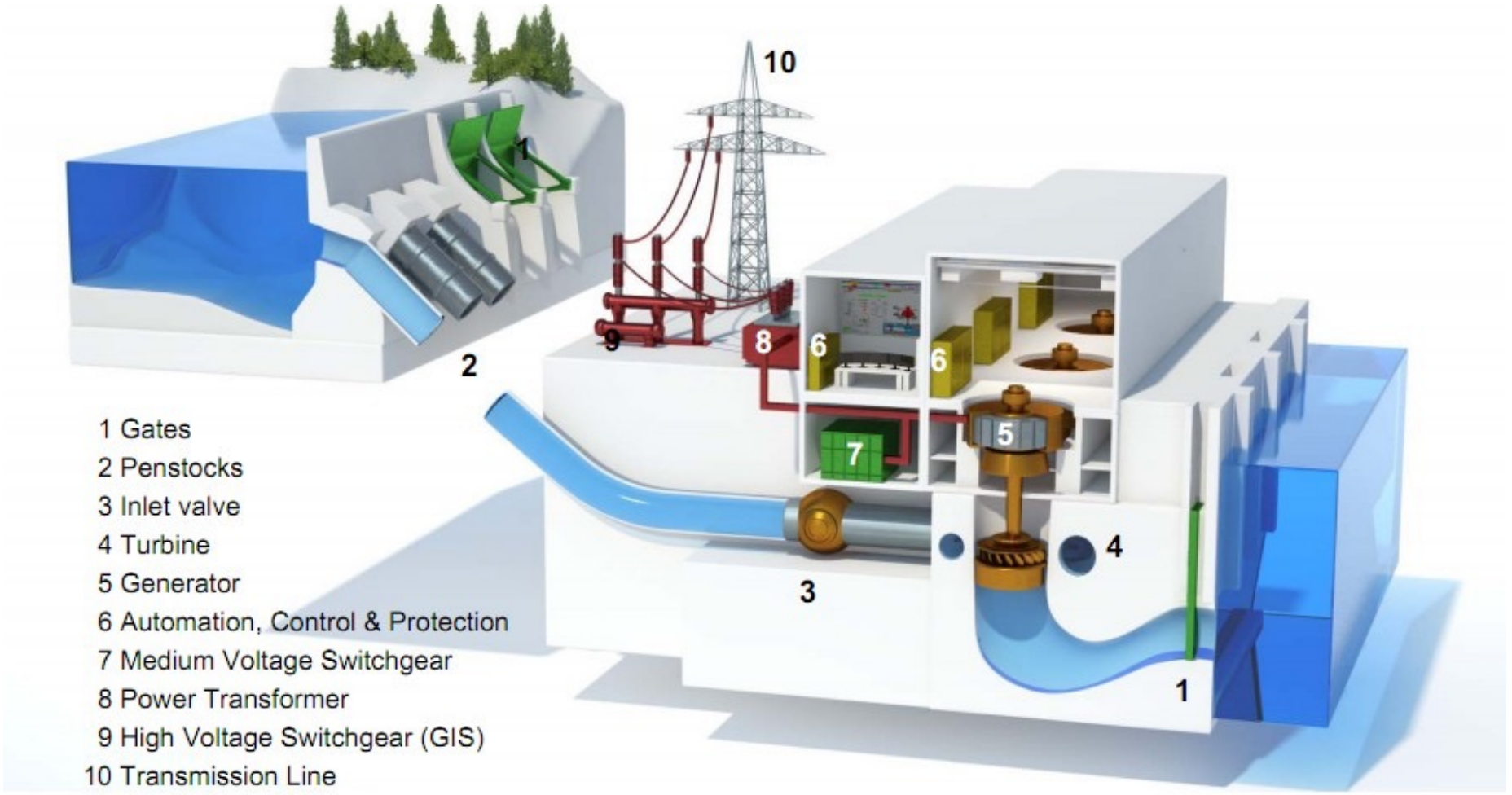


SUNTC HYDRO Contact: Jack Chen Email:jackchenhaiyong@gmail.com

Hydrodynamic Screw

It is suitable low head (0.5-6m) and flow (0.2-5.5m^3/s) site, and no need civil work and complicate installation, but the volume is bit large and production cost is high.





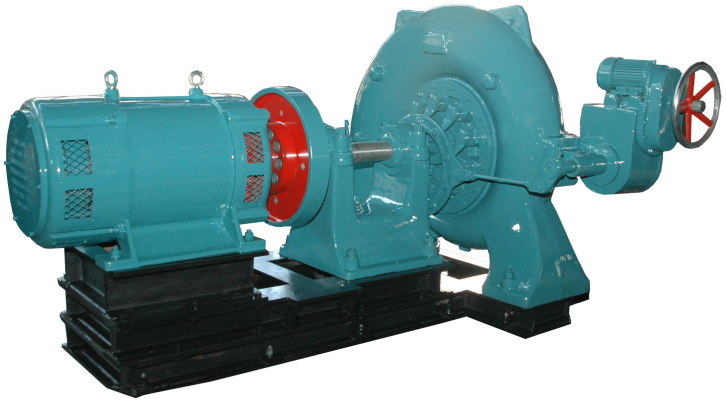
Mini hydro power station overall view

Classification of Hydro Turbines

- Reaction Turbines
  - Derive power from pressure drop across turbine
  - Totally immersed in water
  - Angular & linear motion converted to shaft power
  - Francis, Kaplan and Propeller turbines
- Impulse Turbines
  - Convert kinetic energy of water jet hitting buckets
  - No pressure drop across turbines
  - Pelton, Turgo, and Cross flow turbines

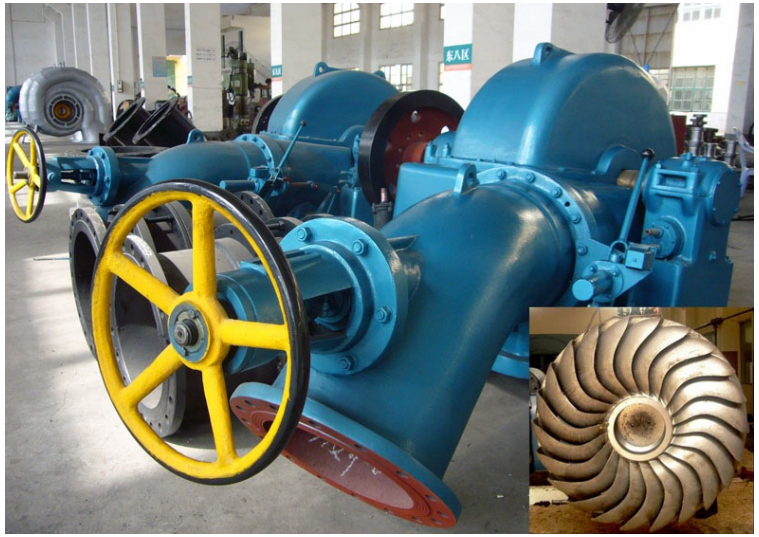
Francis Turbine

- The diameter of the runner is 0.42m- 6.0m;
- Suitable water head: H = 8m- 140m;
- Suitable flow: Q =0.2m3/s- 20m3/s;
- Capacity of the generator unit: 50kw -50MW



Turgo turbine

- The diameter of the runner is 0.32m- 0.63m;
- Suitable water lead: H =30- 205m;
- Suitable flow: Q =0.089- 2.30m3/s
- Capacity of the generator unit: 50kw -3MW

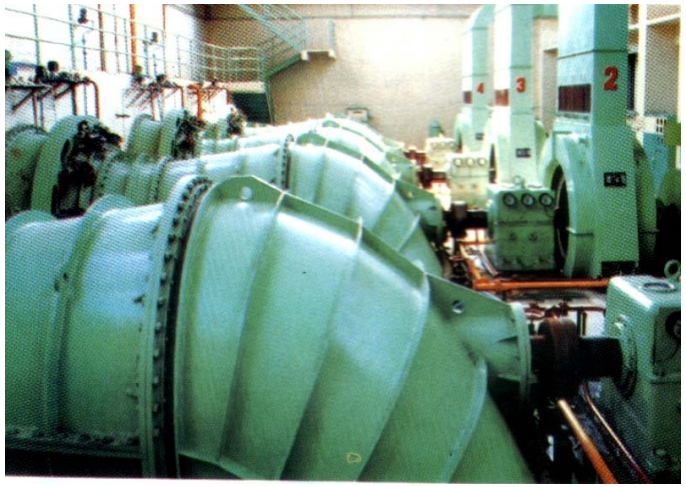


Pelton turbine

- The diameter of the runner is from 0.45m- 2.5m;
- Suitable water head: H =84m- 1200m;
- Suitable flow: Q =0.08m3/s- 4.10m3/s;
- The capacity of the generator unit: 200KW- 10MW.

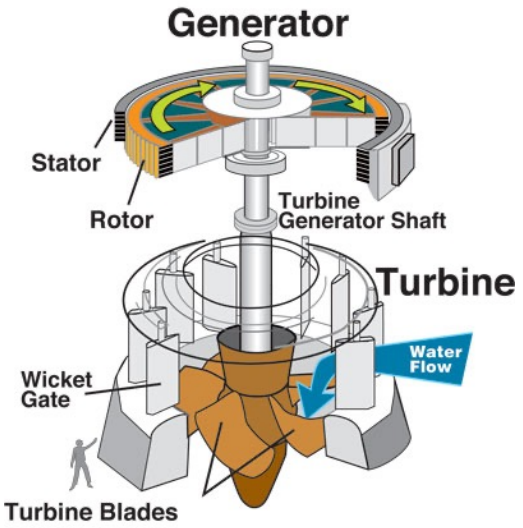
Tubular turbine

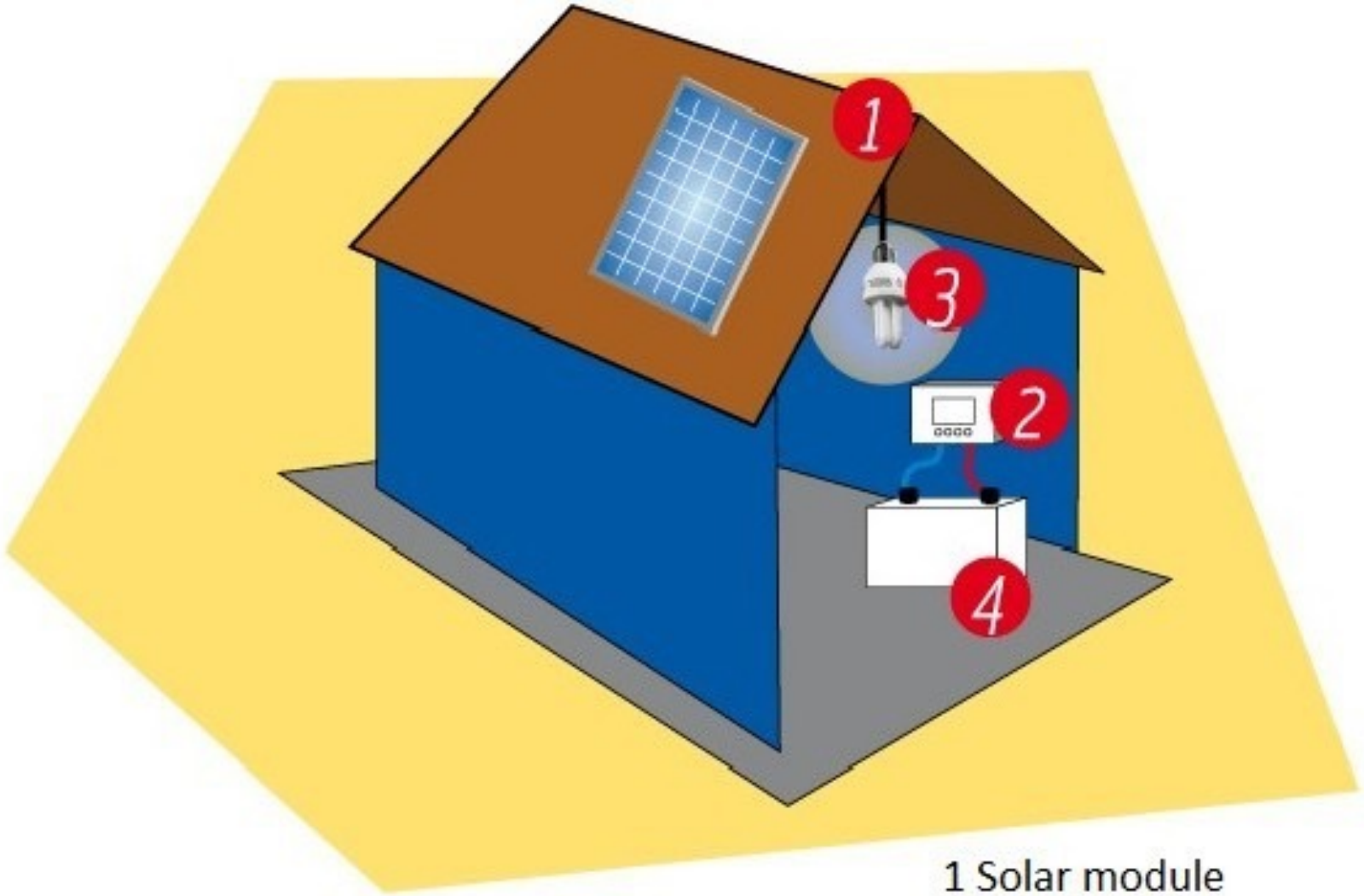
- The diameter of the runner: 1.2m- 4.5m;
- Suitable water head: H =3m- 15m;
- Suitable flow: Q =1.0m3/s- 250m3/s;
- The capacity of the generator unit: 250KW- 8MW



Kaplan (Propeller) turbine

- The diameter of the runner: 0.3m- 3.5m;
- Suitable water head: H =2m- 30m;
- Suitable flow: Q =1.0m3/s- 200m3/s;
- The capacity of the generator unit: 50KW- 4MW

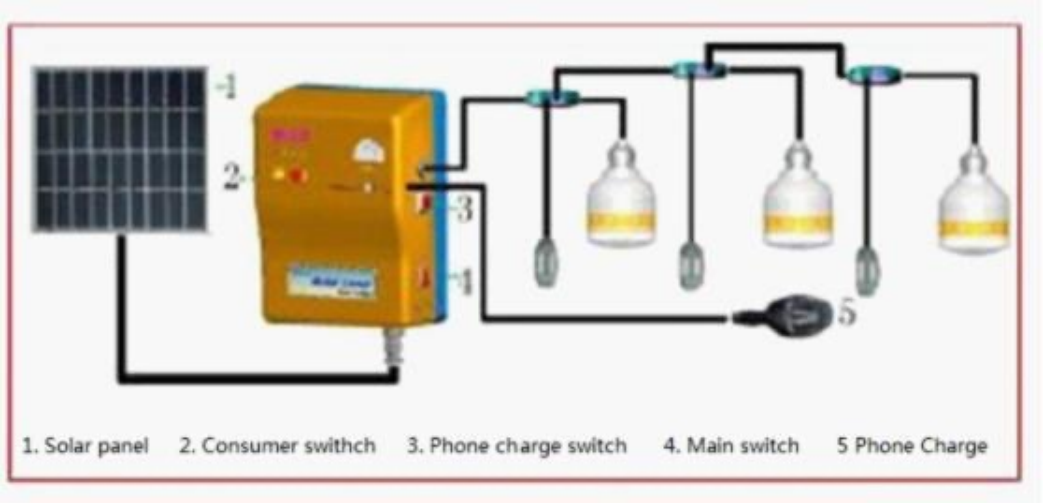


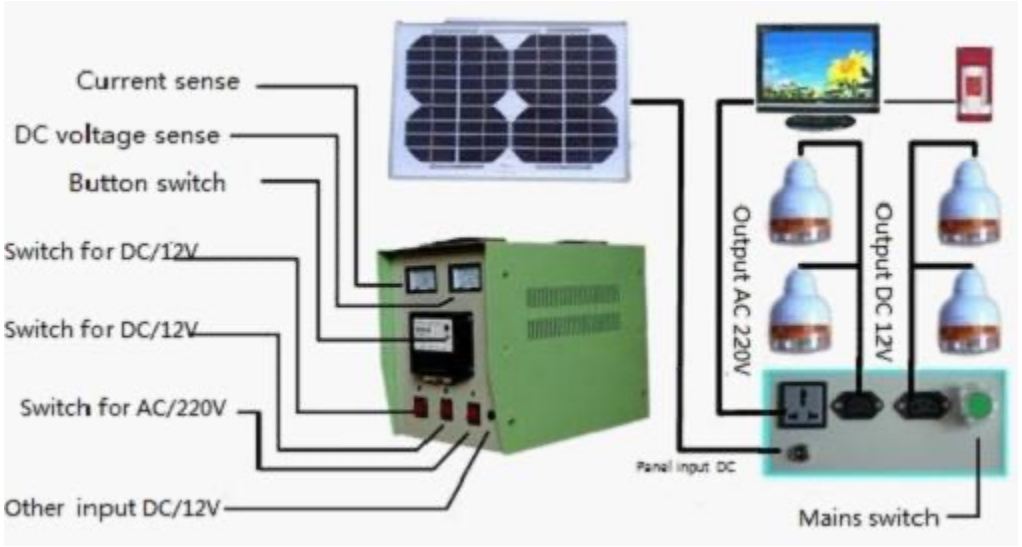


1 Solar module
2. Charge controller
3. DC/AC loader
4. Battery

Solar home lighting kits

SUNTC HYDRO Contact: Jack Chen Email:jackchenhaiyong@gmail.com


1
2
3
4
5
1. Solar panel
2. Consumer swithch
3. Phone charge switch
4. Main switch
5 Phone Charge


Current sense
DC voltage sense
Button switch
Switch for DC/12V
Switch for DC/12V
Switch for AC/220V
Other input DC/12V
Output AC 220V
Output DC 12V
Panel input DC
Mains switch

<The End>