Standart

Pump • Fire Fighting Units • Booster Set

hydropower

PUMP as TURBINE

Application Areas

- Water supply lines
- Pressure regulated water network lines
- Waste water lines
- Geothermal energy plants
- Reverse osmosis applications
- Industrial facilities
- Agricultural irrigation applications
- Advanced test stands

Tecnical Data

Capacity	30 - 4000 m^3/h
Head	10 - 200 m
Power	up to 1000 kW
Speed	2 - 4 - 6 - 8 pole synchronous speed
Design type	Norm, double suction or multistage

Design Features

•Norm, multistage or double suction pump design can be delivered upon request.

•Hydropower, or in other words Pump as Turbine, is an affordable and easy alternative way of turbine usage for energy generation.

•Using turbine for energy resupply is a highly expensive investment for powers less than 150 kw, since the return on investment will cost the customer more than 10 years. The same payback period will be 2-3 years in maximum in Pump as Turbine systems.

•Hydropower can be used in parallel forms to meet the variable water capacity requirements. With these parallel forms, higher capacities become deliverable with more efficient systems.

•Plus, maintenance and operation is simpler and more economic comparing to the hydraulic turbines.

•Norm, multistage or double suction pump design can be delivered upon request.

•Hydropower doesn't have any guide vanes for flow regulation. In addition to the by-pass of the excess capacities, more than one pump as turbine can be used to meet various needs through these systems.

•With hydropower
- It is possible to generate electiricty for off-grid regions, especially for drinking water transmission and network regions. Moreover, the losses can be decreased with the help of pressure regulations.
- It easily generates electricity for on-grid regions by directly connecting to electric networks with or without extra setting needs.
- It can be used as a driver by directly assembling with another machine.

PaT Designation

HydroPower DS-V-200-4-5-N

Model	
Type	**NT: End Suction** **DS: Double Suction** **KM: Multistage**
Vertical Installation (optional)	
Installed Power (kW)	
Motor/Generator pole number	
Grid	**5: 50 hz** **6: 60 hz**
System	**N: On-Grid** **F: Off-Grid**

Hydropower: End Suction Norm

Hydropwer / NT

•Horizontal radially split volute casing type, single stage, end suction, pump as turbine systems with closed impeller.

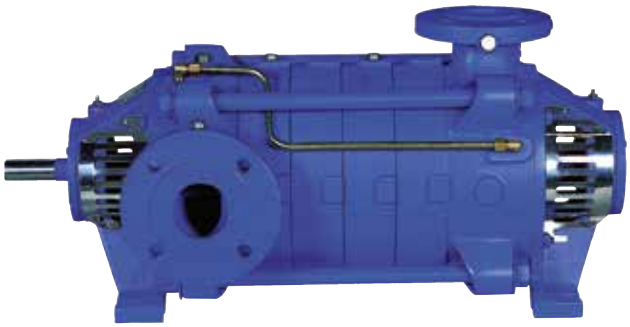
•Designed to work in between 100- 1800 m3/h capacities with 10-120 m net heads.

Hydropower / NT - V

•Vertical radially split volute casing type, single stage, end suction, pump as turbine systems with closed impeller.

•Designed to work in between 100- 1800 m3/h capacities with 10-120 m net heads.

Hydropower: Multistage



Hydropower / KM

•Horizontal ring section, multi stage, pump as turbine systems with closed impeller and diffuser.

•Designed to work in between 30- 500 m3/h capacities with 10-250 m net heads.

Hydropower / KM - V

•Vertical ring section, multi stage, pump as turbine systems with closed impeller and diffuser.

•Designed to work in between 30- 500 m3/h capacities with 10-250 m net heads.

Hydropower: Double Suction

Hydropower / DS

•Horizontal radially, axial splict case, single stage, double suction pump as turbine systems.

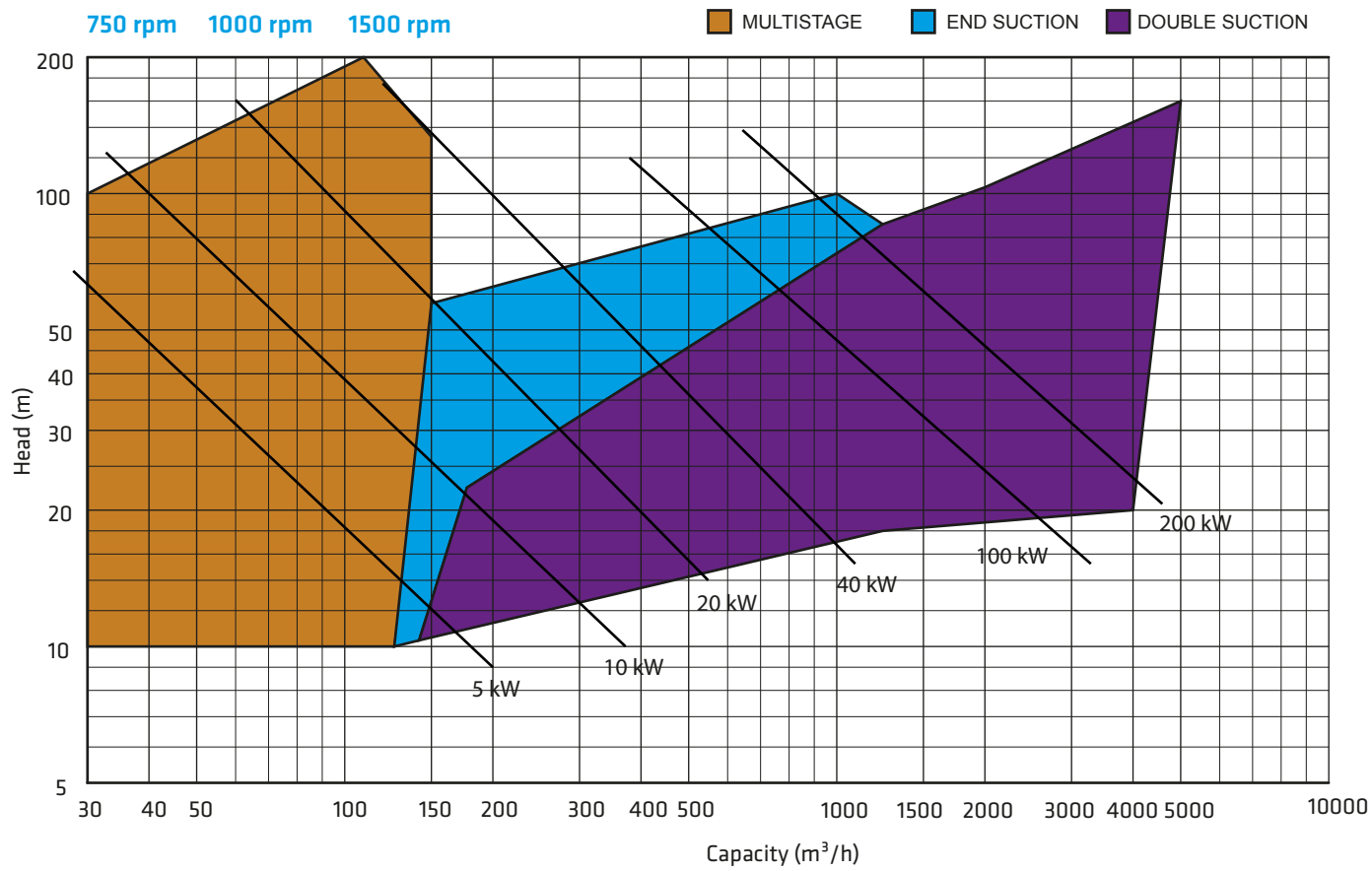
•Designed to work in between 150- 4000 m3/h capacities with 20-150 m net heads.

Hydropower / DS - V

•Vertical radially, axial splict case, single stage, double suction pump as turbine systems.

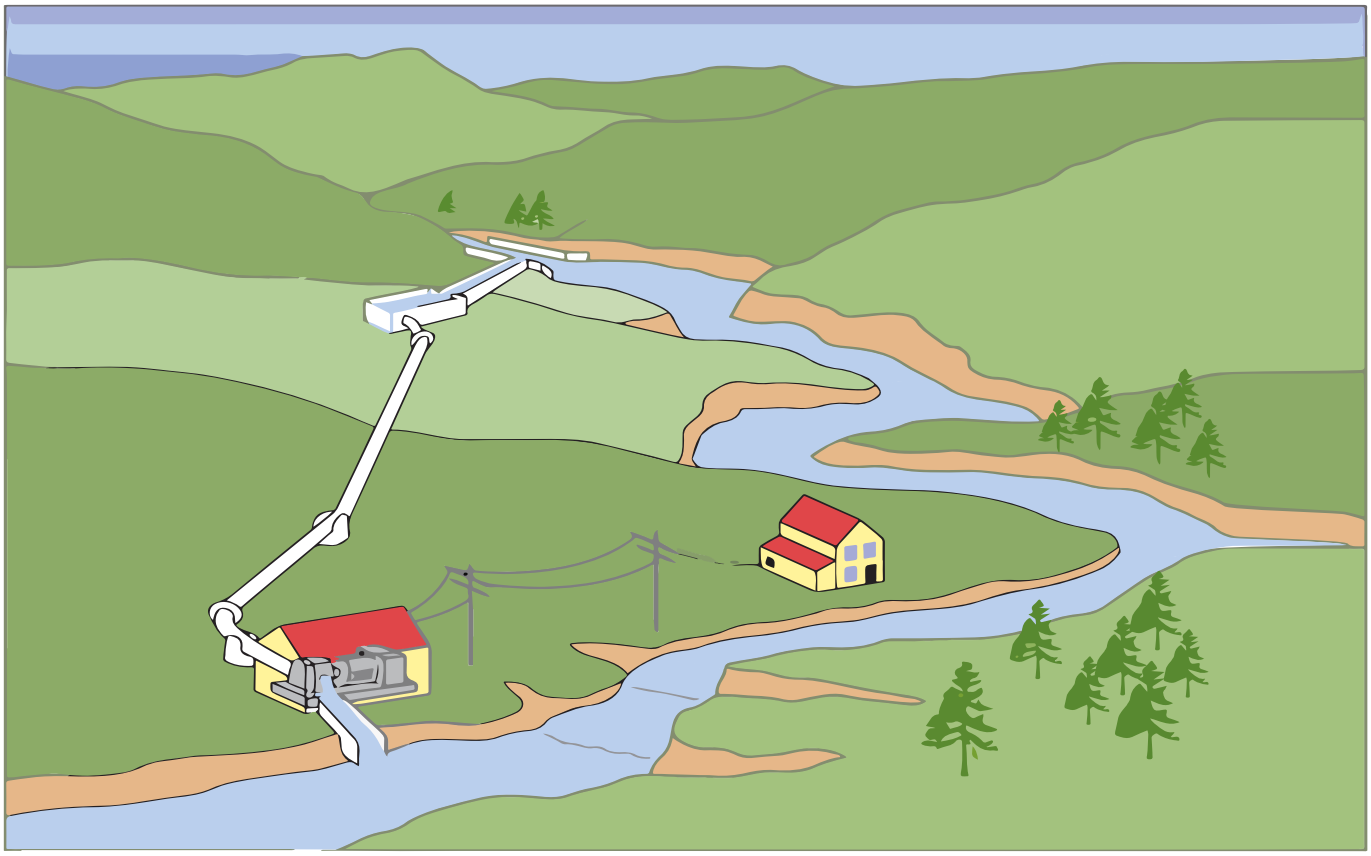
•Designed to work in between 150- 4000 m3/h capacities with 20-150 m net heads.

Field Chart



For more capacity, head or power requirements, please get in contact with our company via our web site.

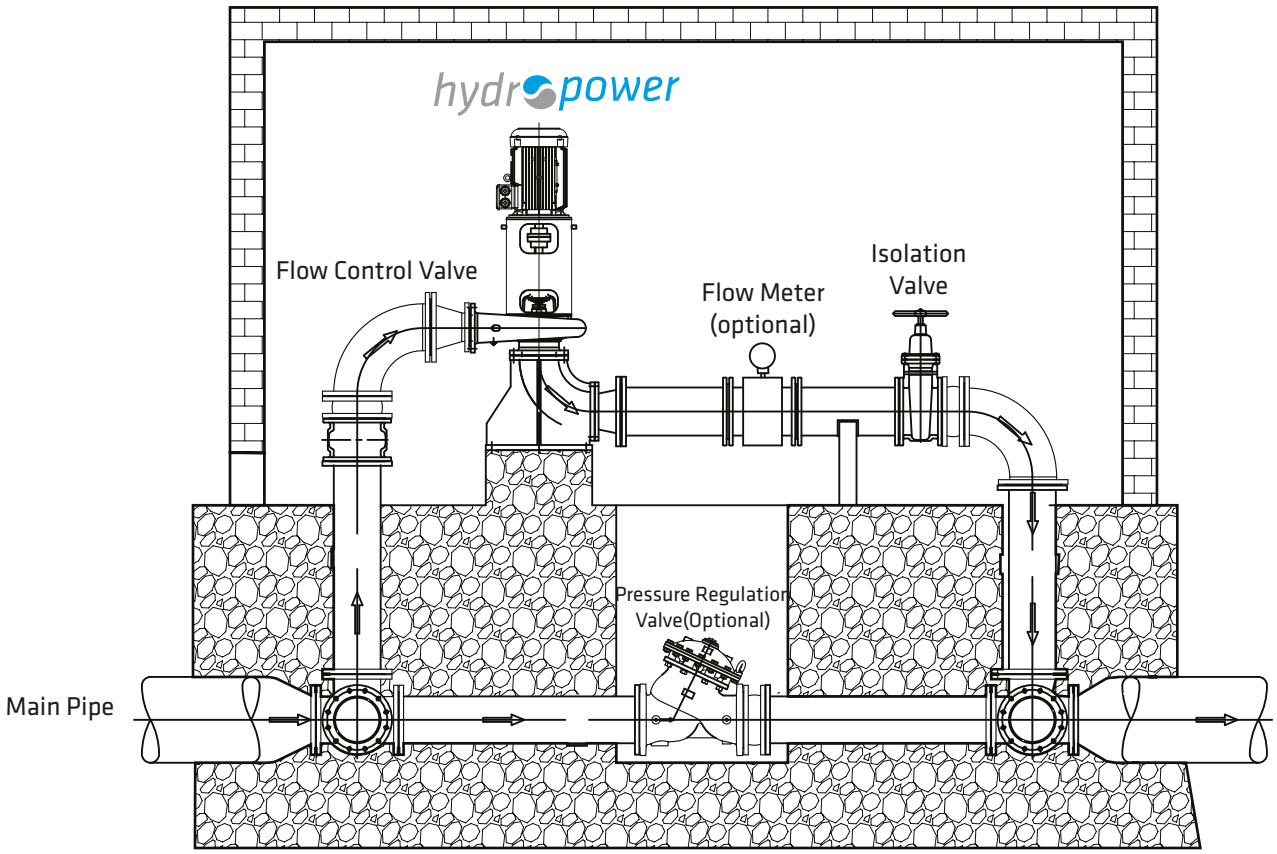
Electric Generation for Isolated (Off-grid) Areas



Generation of Electricity for Drinking Water Needs in off/on-grid regions:

There are so many alternative ways in the market and regulation due to pressure is one of the best ways of contolling losses regarding to resources in literature. To regulate pressure, atmospheric tanks and pressure regulating valves (PRV) can be alternatively used. Since, PRV needs extra investments and underutilizes the broken energy, it will not be a wise option to choose. Instead, it would be better to utilize the idle energy and re-generate it with either hydraulic turbines or pump as turbines, which we call “Hydropower” systems. Standart “Hydropower” series pump as turbines, provide both energy savings and efficient water loss controls where energy is broken in the systems.

Hydropower Installation for a Typical City Drinking Water Piping System



Pump as Turbine Projects

In order to calculate the needs, annual water capacity and head requirements shoul be known by our customers. With these statistical inputs, optimum systems can be designed.

In order to use Pumps as Turbine following issues should be covered:

•Since capacities in pump as turbines at best efficient points would be more than stand alone pumps, the mechanical stress should be carefully considered in these systems.

•Rotating items shouldn’t be harmed or discharged while rotating in opposite direction.

•Turbine should not run away during the bypass of excessive water.

•Extra precautions should be taken for cavitation and water hammer risks.

•System should be adoptable to new conditions according to changes in capacities and heads.

•It is generally a good option to use hydropower in parallel forms to maximize the outputs. This rule is eligible for both on-grid and off-grid regions.