AQuA®©

MAKE IN INDIA

WORKMAN SHIP 30 MONTHS WARRANTY

Dry Installed, Flood Proof *(fully immersible)*; Back Pull Out Volute Pumpsets

***ANFP** for Sewage*

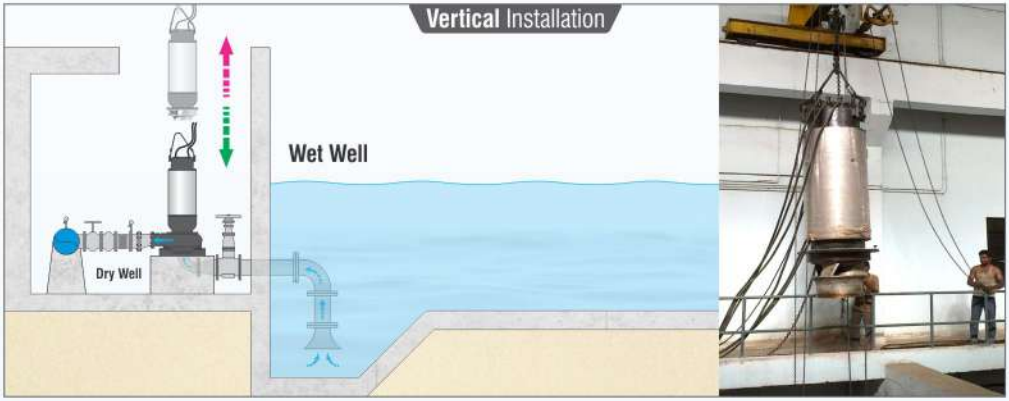
***ARFP** for Water*

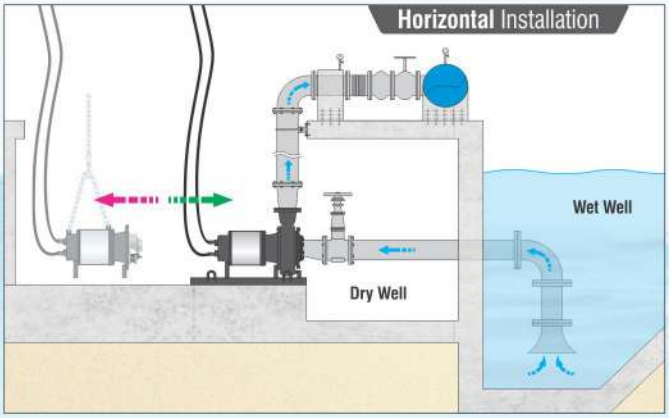
***ASFP** for Industrial Waste Water*

Flood Proof Insurance for Dry Well Pumping Stations

www.aquapumps.com

Installation : **Sump Suction**

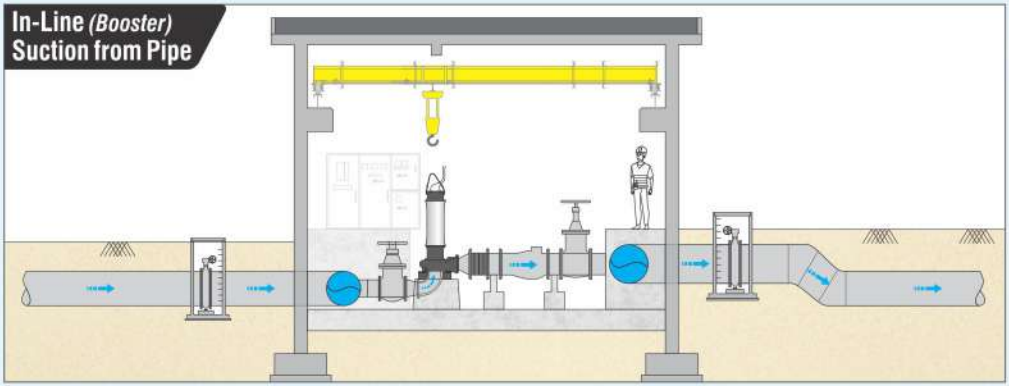




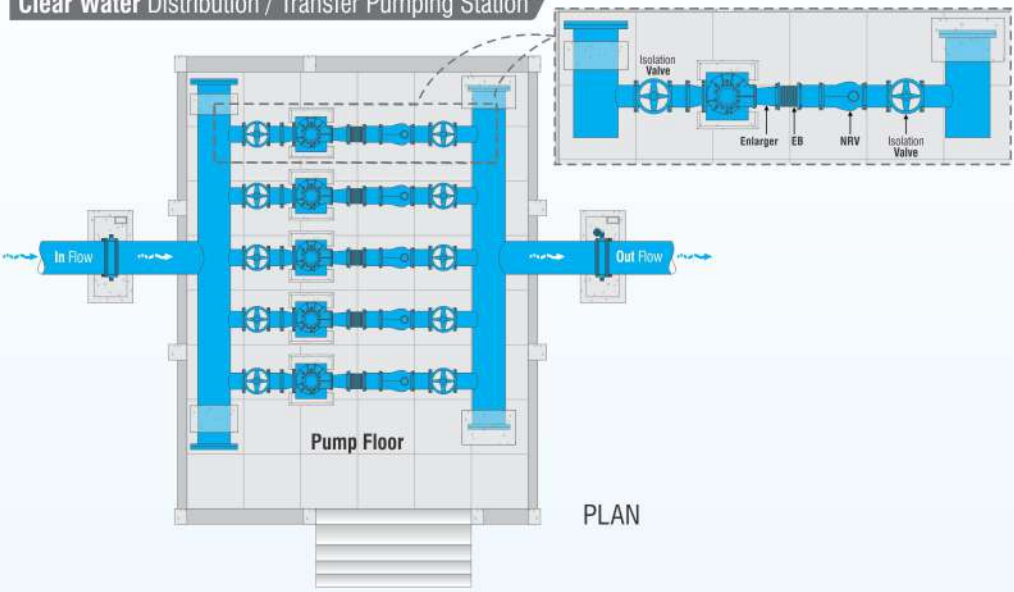
Thanks to the **Back Pull Out design**, in the unfortunate event of Impeller Choking *(by large hard solids)*; the Entire Motor+ Shaft+Impeller can be pulled out as a **Single unit** *(without disturbing the pipeline)*; Cleaned in hygienic condition at Ground Level & Refitted within minutes *(without the risk of misalignment)*.

Hence Operators don't need to stay in the hot, humid Dry Well *(& Possibly Septic Condition)* for longer durations.

In-Line *(Booster)* **Suction from Pipe**

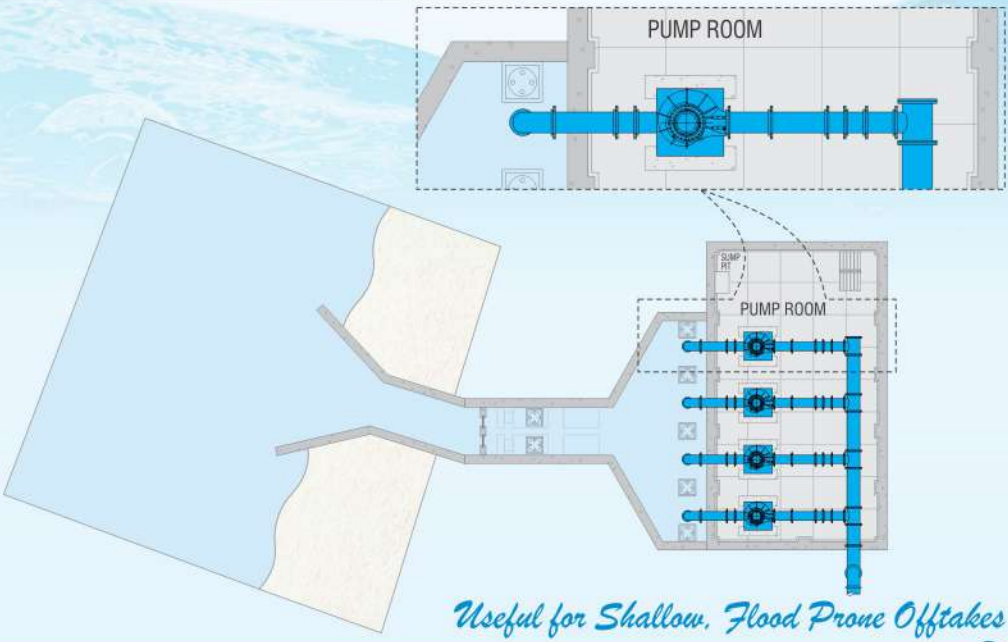


Clear Water Distribution / Transfer Pumping Station



PLAN

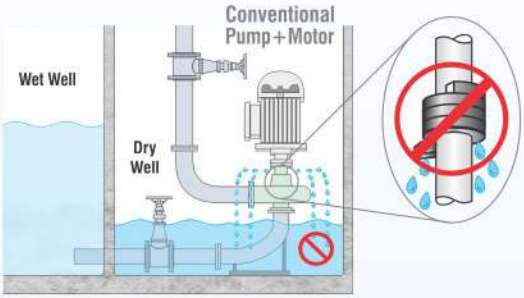
Flood Proof Raw Water Offtake Pumping Station



Useful for Shallow, Flood Prone Offtakes

Benefits of Aqua's Dry Installed, Flood Proof *(fully immersible)* Pumpsets

Thanks to the use of Two Ultra High Quality **Mechanical Shaft Seals,** there is **no Nuisance Leakage** *(from Pump Gland Rope)* into the Dry Well resulting into **a Dryer** & more **Hygienic** operating conditions.



...Minimal Health Hazards to Operator by Skin Contact to Septic HIV, Hepatitis, etc *(present in Sewage).*

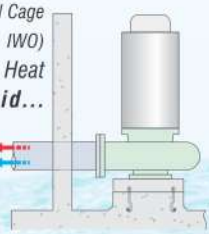
...No Need of Dewatering Pump for Leakage Control

...No Breeding ground for **Mosquitoes**

Motor Heat Disposal

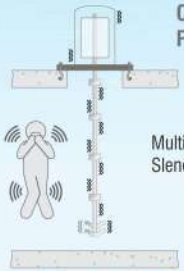
Conventional Pumpsets use Totally Enclosed **AIR Fan** Cooled ***(TEFC)*** *(Squirrel Cage Induction)* **motor** *(Shaft Mounted Fan - IC4A1A1)* which **dissipate** their Heat & Noise into **Dry Well...**

Aqua's Flood Proof Pumpsets use Totally Enclosed *(IP68)* **Glycol + WATER** Cooled ***(TESWC)*** *(Squirrel Cage Induction)* **motor** *(IC4A IWO)* which ***dissipate*** their Heat into ***Pumped Liquid...***



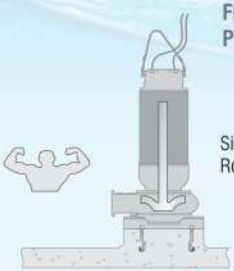
No need of Costly, Maintenance Prone & Energy Wasting Air Handling Units ***(AHU)***

Conventional Pumpsets



Multiple, Jointed; Slender Shafts

Flood Proof Pumpsets



Single, Rigid; Robust Shaft

Weather Proof
...works even if the entire Pump Room is **Flooded**

Saves *(upto 75%)* **Spare Parts & Consumables***

VFD Compatible

As the **Critical Speed** of Flood Proof pumpsets lies **Safely Above** it's Maximum Speed, there is **No Risk of Structural Resonance** or **Excessive Vibration** *(when speed is varied with VFD)*

No need for Frequent Periodic....

Shafts/Sleeves &/or **Coupling**

Gland Packing

Oil &/or **Grease**

Saves *(upto 33%)* **O&M Staff***

Design: **Pumpset**

Flood Proof Motor Pumpsets are the latest technological development - their Pump-end is similar to **Conventional** *(End Suction Non Clog OR Mix Flow)* **Volute pumps** while their Motor-end is much more superior then Conventional Air / Water Cooled Bare Shaft Induction motors - these motors *(already popular in Submersible pumpsets)* are **Fully Immersible** thanks to their **IP68** enclosure.

These pumpsets easily fit into existing piping systems & hence **offer a Flood Proof upgrade** to your **Existing Dry Well** pumping stations.

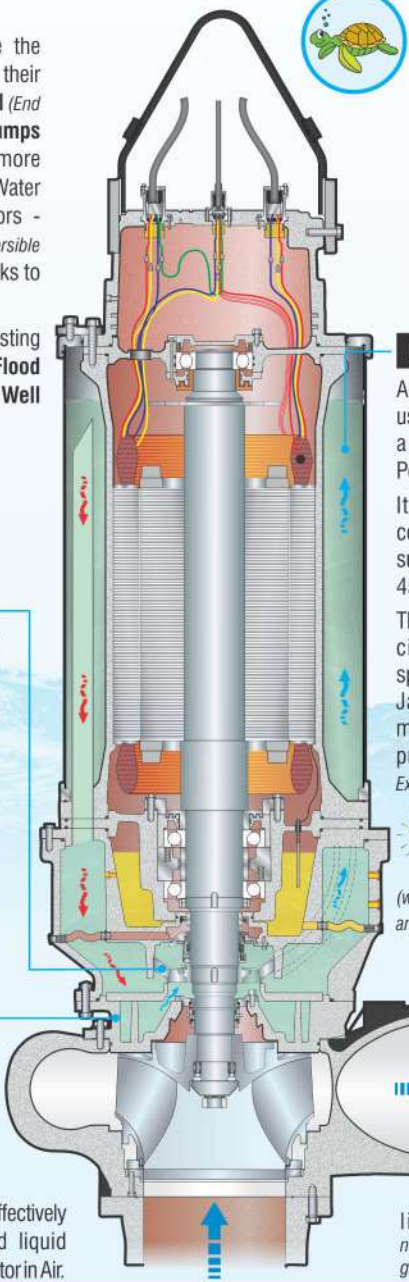
Coolant Pump

The **Inbuilt** Water + Glycol Circulating Impeller is key driven by the pumpset's shaft itself *(& hence it doesn't require any additional motor or maintenance)*

Heat Exchanger

The maintenance free, Inbuilt **Water** *(Glycol)* **to Water** *(Waste Water)* Heat Exchanger is built of sturdy **Cast Iron** & has smooth surfaces *(on the pump end)* thereby ensuring zero clogging by solids in pumped media.

The Heat Exchanger & Coolant Pump effectively transfer motor's heat to pumped liquid enabling **S1** operation even with the motor in Air.



The motor is **Amphibious** & hence can safely operate either in totally Dry or Submerged *(Flooded)* conditions.

A built in Jacket Cooling system ensures that the motor is efficiently cooled irrespective of whether or not it is submerged; while the **IP68 Enclosure** ensures that even if the surroundings are flooded, the motor is safe to run.

Design : **Motor Cooling**

Aqua's **Closed Loop Glycol** system uses a mixture of **Potable Water** & any commercially available Polypropylene Glycol formulations.

It has excellent heat transfer, corrosion resistance properties & is suitable for temperatures between -45°C to **+55°C**.

The coolant is circulated by an Inbuilt circulating Impeller through the space between the Motor Casing, Jacket Shell thereby extracting motor heat & dissipating it to pumped liquid *(via an inbuilt Heat Exchanger)* away from the Dry Well.

...i.e. this is a huge benefit over Conventional Pumps *(which use Air Cooled motors (whose motor heat is dissipated into the ambient air))* of the Dry Well.

This fully integrated, automated Closed Loop cooling system is **insensitive to solid impurities** of the pumped liquid *(as the coolant is never contaminated irrespective of the grit/silt level in pumped liquid).*

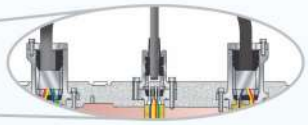
Design: **Motor**

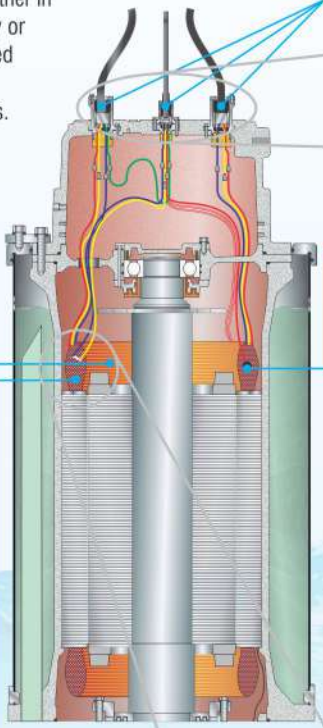
HT Motor

LT Motor

The motor is **Amphibious** & hence can safely operate either in totally Dry or Submerged Flooded conditions.

Water Proof Cable Glands are specially designed as per **IP68** to prevent water ingress *(into the motor windings)* even in case of water flooding the dry well





Motor Thermal Overload Protection
Bi-Mettalic switches are embedded into each phase of winding to detect accidental overheating & thereby trip off the power. Optionally Thermistors or PT 100 Transducers can also be offered.

The Totally Enclosed, Self Circulation Water Cooled *[**TESWC IC-4A1W1** to **IEC/IS-60034_6**]* motor is similar to Dry Type Induction Motor, the major difference being the Degree of Protection - it is of **IP-68** Enclosure to ensure **Hermetic Sealing** *(even if an accidental water flooding the dry-well)*.

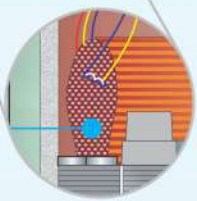
It is cooled by an inbuilt cooling mechanism which uses Potable Water + Commercially available Glycol Mixture as a Coolant.

VFD Compatible

Thanks to the very high Thermal Conductivity of Water + Glycol *(as compared to Air)*, Aqua's Flood Proof pumpsets can be safely run staying cool even at reduced frequency despite harmonics from VFD

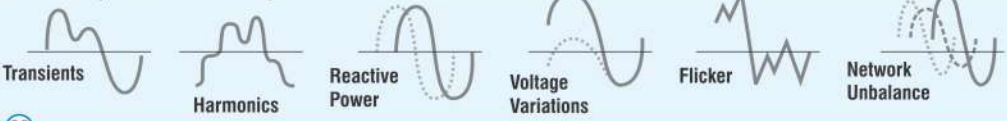
World's Best, Premium **Motor Insulation**

Insulation is based on **"Power House"** type treatment *(**Mica based; Dual Vaccum Pressure Resin Impregnation (VPI)**)* technology for Superb **Di-Electric Strength** due to use of costlier **Resin** *(v/s cheaper **Varnish** used by most Competitors)*.



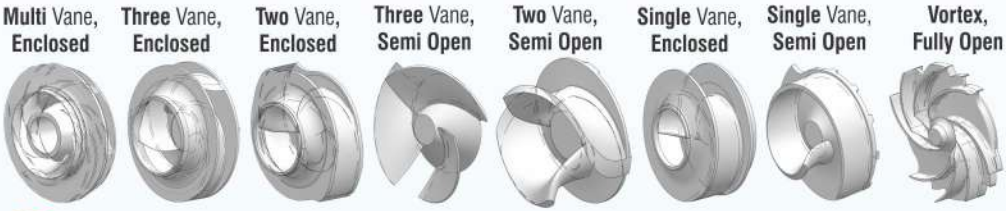
Thanks to **generous Reserve Margins** & Optimized Design; Aqua's Motors keep coolly working even upto **+55 °C.**

Hence, Aqua's **Motor easily tolerates :**



Design: **Pump End**

A wide variety of **Impellers** for optimal Efficiency & Non Clogging performance in every type of liquid



Improving Efficiency

Improving Non Clogging Reliability

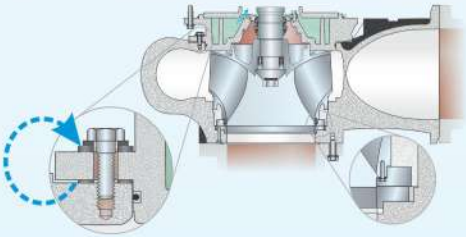
Pump Casing is of End Suction **Volute** type & Impeller is mounted **directly** on to the Extended Shaft of the motor hence **eliminating alignment** & **vibration problems.**

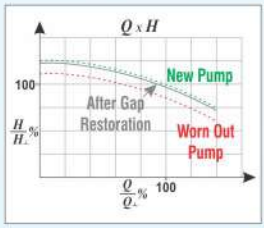
Smart Set Hydraulics : For **Restoration of Efficiency**

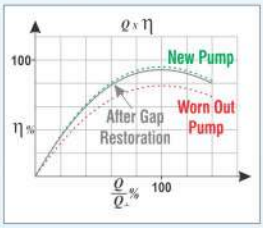
Sustenance of Pump's Efficiency is **inversely** proportional to the **Leakage Gap** *(between its Impeller -Casing Wearing Rings/ Faces)*

During pumping, prima faciely due to Small Solid particles *(Silt, Ash, Grit, etc)* in the pumped liquid; the Surfaces of Wearing Rings/ Faces **erode** & unfortunately **enlarge** this Leakage Gap *(causing an unavoidable drop of efficiency)* - to **Restore** the pump's efficiency, this *(increased)* Gap needs to be **decreased** *(as near as possible back to original levels)*

In competing pump's designs, the Geometry of this Wearing Ring / Face Gap is **Cylindrical** which thus forces the Customer to **buy new Spare** Wearing Rings - replacing Wearing Rings is a Costly & Time Consuming affair...!







However, as a part of our Least Life Cycle Cost designs *(considering increased erosion due to excessive Silt, Ash & Grit in Indian conditions)*; Aqua has designed an **Axial** Geometry *(for its Wearing Rings/ Faces)* which enables Restoration of the Leakage Gap without the need of Spare Wearing Rings ***(& within minutes** by simply changing over position of the Packing Washers)* - i.e. at **Zero Cost**

Design : **Shaft**

Pump Clogging though un-desirable, is often unavoidable, It causes severe Stress on Shaft. To tackle this problem, Aqua's Pumpsets are built with an **Oversized** Stainless Steel **Shaft** & designed **without** Any Couplings or **Sleeves** *(below the Mechanical Seals)* thereby **Eliminating shaft failures, Reducing Maintenance** & the eliminating **need** of **Spare Parts** for **15years.**

OverSized Mono Shaft for Fail Safe Operation

Design : **Bearings**

All **Thrusts** are absorbed by **Grease Lubricated Anti Friction Bearings** located deep inside the motor.

Superb Bearing Life

A Typical Bearing of L_{10H} life of 1,00,000 hours &/or 10 years.

Premium, **Ultra Long Life; Synthetic Grease**

Ensures a Typical Re-Greasing Interval of 50,000 hours &/or 5 year

Design : **Seals**

Shaft Sealing is by means of **Two**, Independent, high quality Bi-Directional; **Mechanical Seals** *(& the Primary seal is always of **Silicon Carbide** faces to withstand Erosion incase of increased silt & grit content in sewage/ water)* hence there is Zero Leakage of water/ septic sewage into the Dry Well from the Shaft Gland.

Seals have L_{10H} life in excess of **50,000** hours &/or **5** years.

Design : **InBuilt Monitoring Systems**

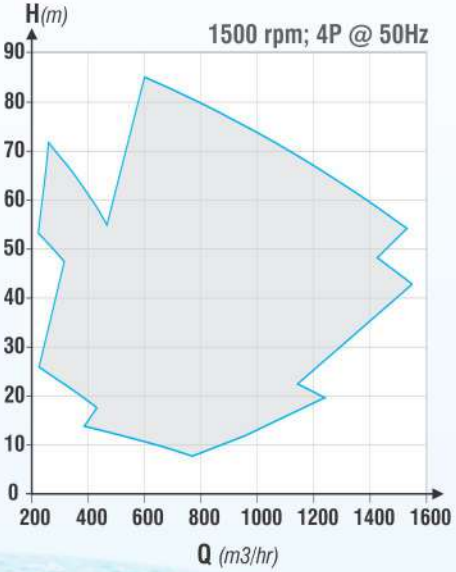
Simple, Uncomplicated yet Effective ...proven in Indian Conditions

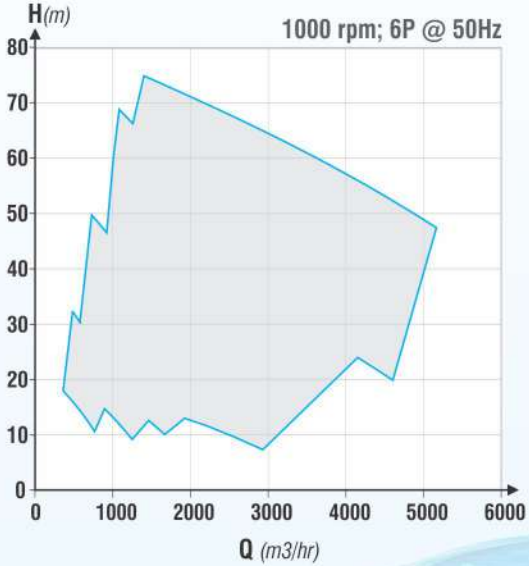
- **SSLD** detects Pressurized Water Leakage from Mechanical Seals.
- **CCWLD** detects Accidental Water Leakage from Cable Sheath's Cuts &/or Nicks into the Motor.
- **SBWLD** detects Accidental Water Leakage in to Motor's Stator Chamber.

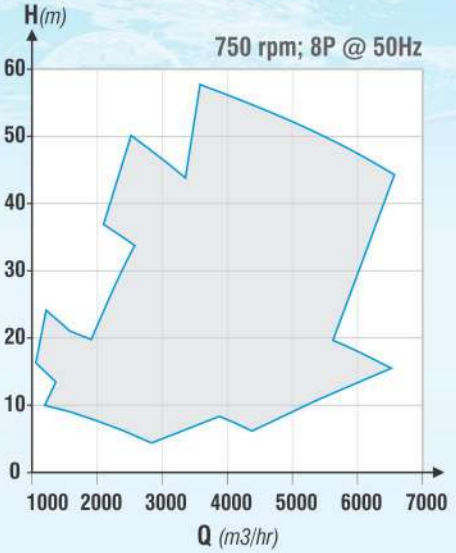
- **BTDs** in the form of Bi-metallic Switches *(for All Pumpsets)* & **RTD's** *(PT100 - 3 Wire Simplex type - from Size > 150kW)* to monitor Bearing Temperature *(without any Additional Cost)*#.
- **WTDs** in the form of Bi-metallic Switches *(for All Pumpsets)* & **RTD's** *(PT100 - 3 Wire Simplex type - 1 per each Phase - from Size > 150kW)* to monitor Winding Temperature *(without any Additional Cost)*#.

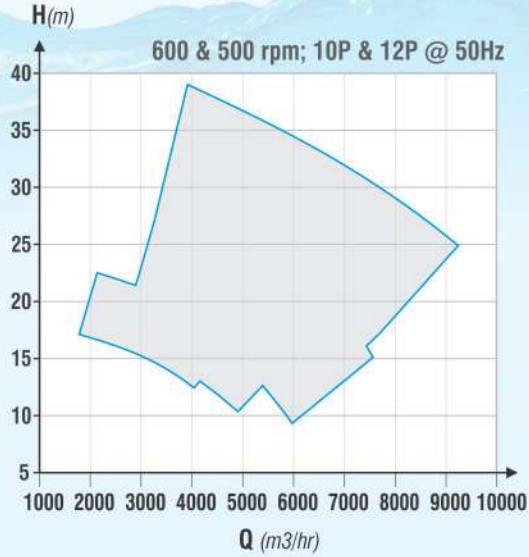
#requires additional communication hardware

Typical **Performance Range**











Standard **Technical Specifications**		
Pump	**Discharge Sizes**	DN 250 to 800mm
	Flow Rate	Upto 9,500 m^3/hr
	Head	Up to 85m
Motor	**Ratings**	22.5kW to 1000 kW
	Speeds	1500, 1000, 750, 600 & 500rpm *(synchronous)*
	Duty & Enclosure	S1 & Exceeding IP 68
	Supply Options	3Ø; 415V, 3300V, 6600V, 11000V
Intelligent InBuilt Monitoring	**Secondary Seal Leakage Monitoring** *(SSLD)*	By built in Detection System
	Cable Connection Chamber Water Leakage Detector *(CCWLD)*	Typically Available from size 200kW* & above
	Winding Temp Detector *(WTD)*	Available by default by Bimetallic Switches in each phase *(PT100 optionally available for sizes 150kW & above)*
	Drive End Bearing Temperature Detector *(BTD) (DE)*	Available by default by Bimetallic Switches from size 22 kW & above *(PT100 optionally available for sizes 150kW & above)*
	Non Drive End Bearing Temperature Detector *(BTD) (NDE)*	Available by default by Bimetallic Switches from size 22 kW & above *(PT100 optionally available for sizes 150kW & above)*
	Stator Chamber Water Leakage Detector *(SBWLD)*	Available from size 45 kW & above

Material of **Construction** *(MoC)*			
		Option 1	**Option 2**
Pump Volute Casing		Grey Cast Iron, Ductile CI, NiResist, NiAL Bronze *(NAB)*	CF8, CF8M, CD4MCu
Impeller / Propeller		CF8, CF8M	CD4MCu
Motor Casing, Cable, Terminal Chamber		Grey Cast Iron	CF8, CF8M, CD4MCu
Oil Chamber		Grey Cast Iron, Ductile CI	CF8, CF8M, CD4MCu
Shaft		Stainless Steel *(SS401 / SS431)*	
Fasteners		Stainless Steel *(A2 - SS304)*	Stainless Steel *(A4 - SS316)*
Jacket Shell		Stainless Steel *(SS304)*	Stainless Steel *(SS316)*
Elastomers		Nitrile	Viton
Mechanical Shaft Seals	**Primary** *(Pump Side)*	Silicon Carbide v/s Silicon Carbide	
	Secondary *(Motor Side)*	Cast Chrome Moly Steel v/s Resin Impregnated Carbon	Silicon Carbide v/s Silicon Carbide
Wearing Ring / Plate *(Casing)*		Stainless Steel	
Motor Squirrel Cage Rotor Bars		Aluminum bar	Copper bar
Cables		PVC insulated, Copper Cored	ERPS insulated, Copper Cored
Oil		Eco friendly Paraffin White Oil ISO VG 20 or 30	
Sole Plate		MS Fabricated	

Some of Our **Other Products**

Submerged Turbine Pumpsets *(AVT)*

Submerged Centrifugal Pumpsets *(SCF)*

Submerged Tubular Column Pumpsets *(ATBP, ATBN & ATBM)*

Submersible Dredging / Slurry Pumpset *(ADSJ)*

Submersible Dewatering Pumpset *(ASSJ)*

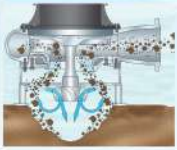
Non Clog Submersible Sewage Pumpsets *(ANS)*

Submerged Elbow Pumpsets *(AES)*

Submerged Mine Dewatering Pumpsets *(AMS)*

Submersible Slurry Hydro Electric Pumpsets *(ASSHE)*

Submersible Slurry Pumpsets *(ASS)*



Submersible Dredging Pumpsets *(ADS)*

Ultra Compact Submersible Sewage Pumpsets *(Scavenger)*

Submersible Sewer Manhole Pumpsets *(AM)*

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