



WPIL SUBMERSIBLE PUMPSET

Engineered for excellence

For Extreme Environments



Custom built in Exotic Materials - Stainless Steels, Bronzes, Super Duplex stainless Steels, Hastalloy C, Ni Hard, Inconel & Others Materials /Designs to Suit Stringent Requirements



Serving Society Since 1952

WPIL Limited

Visit: www.wpil.co.in

WPIL Engineered Pumps

Large engineered submersible pumps design from prestigious Johnston Pump Co., U.S.A. with continual improvement by in-house R&D recognized by Ministry of science & Technology Govt. of India.

Range

- Sizes : 4" to 38" (bowl O.D.)
- Capacity : upto 5000 cu. mtr./hr.
- Ambient temperatures up to 55°C
- Head : upto 400mtrs.
- Custom designs for other parameters & applications.
- Pumps can be produced from existing range of radial turbine , mixed & axial flow pumps to suit any requirements.
- Special grade bearings available.

Applications

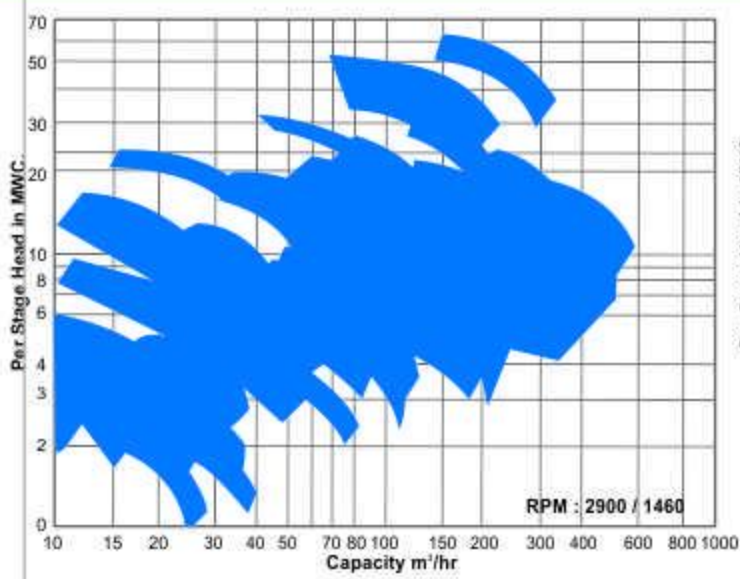
- General water supply
- Offshore fixed & floating platform
- Deep & ultra deep installations
- Nuclear power
- Mine dewatering
- Irrigation & spray irrigation
- Pressure boosting
- Lowering of ground water
- Sprinkler & fountain system

Standards: Indian Standard 8034-1989 ; Hydraulic Institute of Standards , U.S.A.

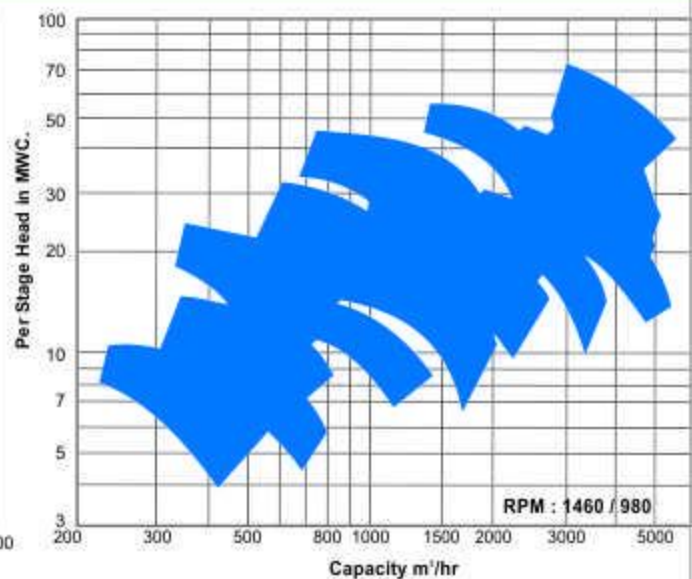
Materials of Construction:

- Grey cast irons
- Bronzes
- Steels
- Stainless Steels
- Duplex & Super Duplex Stainless Steel
- Inconel , Hastelloy & other exotic materials.
- Other materials as per Applications

Submersible pump range chart for 4"-14"



Submersible pump range chart for 16"-38"



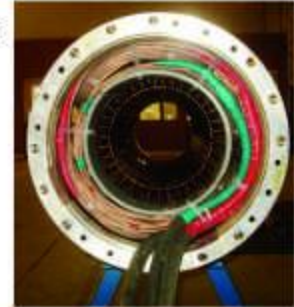
Maximum head 400 mtr., subject to motor availability

WPIL Engineered Motors

Engineered Submersible motor design are from world renowned HAYWARD TYLER of UK with designs engineered according to the customer's specifications and continual improvements with in-house R&D.

Standards: NEMA MG1-1998; IS:9283-1995 (Indian std) Motors for Submersible Pump-sets .

- Motor frame sizes in 4", 6", 8", 10", 12", 14", 19".
- 2 & 4 pole design. (6 pole design in HT available)
- Voltage : 50hz - 400V, 600V, 3300V & 6600V
: 60hz - 480V, 3300V & 6600 V
- Motors are supplied in frame sizes of HP ratings as under

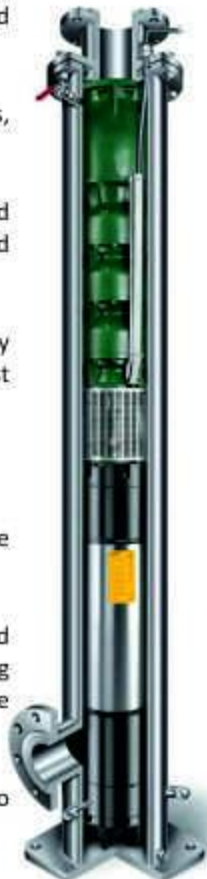


SIZES	HP RANGE	MAX. THRUST AT 50 Hz	MAX THRUST AT 60 Hz
4" Frame	0.5 to 3 hp	450 kg	520 kg
6" Frame	3 to 30 hp	620 kg	740 kg
8" Frame	5 to 75 hp	1020 kg	1200 kg
10" Frame	25 to 150 hp	2450 kg	2900 kg
12" Frame	75 to 300 hp	4000 kg	4550 kg
14" Frame	75 to 350 hp	4850 kg	5300 kg
19" Frame	300 to 1000 hp	8540 kg	9340 kg

- Motors of above rating are suitable for D.O.L., Star/Delta , soft V.S.D.. and ATS starting.

WPIL Advantages

- Excellent motor cooling with cooling impeller inside motor for quick disposal of heat and avoidance of 'hot spot' inside motor. (standard in 4 pole motor)
- Low RPM motor for low friction losses, reliability and trouble free operation.
- Cable choice between copper multistrand conductor PVC flat cable for 70°C operation and EPR/CSP round cable for 90°C operation.
- Oversized carbon radial bearing & heavy duty std. Stainless steel hardened tilting pad thrust bearings.
- Customized motor protection provided.
- Metallurgy selection is suited for highly erosive and corrosive environment.
- Irradiated Cross-linked Polyethylene insulated solid & multistrand winding wire for operating upto 90°C for high reliability under extreme operating condition
- Cable internally connected with triple joint , no chance for leaks
- Mechanical seals or double oil seals, no toxic material



- "Wet-Type" motors with water tight insulated windings that are easy to service(not canned)
- Prefilled motors with antifreeze and rust protection.
- Environmentally safe.
- NEMA connection for universal fit(optional)
- High pump & motor efficiency.
- Higher per stage heads for mechanical sturdiness.
- Motor with inbuilt safety factors.
- Low slip at high torque motor for optimum performance.
- Motor & Pump protection instrumentation system available.
- Large no. of performance combinations for various duties.
- Pump design with Power curves for lower motor Kw at run out conditions.
- Continuously rising head characteristics.

WPIL Engineered Motors - Cross section


- 1** Power supply cable
Heavy duty PVC or rubber Cable
- 2** Non-return valve
Spring loaded or gravity, no clogging and canting. Short closing time avoids water hammer.
- 3** Threaded Stud connections
Quick and low cost dismantling due to screwed connections made of stainless steel.
- 4** Rubber/Bronze/PEEK bearing
Function: highly water resistant bearings. High resistance against sand and vibrations.
- 5** Impellers
Wear resistant impellers of high quality bronze/stainless steel materials of different types. Exact adaptation of duty is possible by trimming the impellers. According to pump type of radial/turbine/mixed or axial construction.
- 6** Stationary and mobile rings
Made of suitable material which are wear resistant, easily replaceable.
- 7** Casing
Casting is Cast Iron/steel/bronze and stainless steel.
- 8** Special WPIL connection of the pumps
For connection of the WPIL motors without problems.
- 9** Sealing of motor shaft
Mechanical shaft seal and double lip seal system with highly wear resistant silicon carbide for a long life.
- 10** Pump and motor shaft
Design with high grade stainless steel. Therefore high resistance against wear and corrosion. The motor shaft of stainless steel is over dimensioned, for low vibrations and long life.
- 11** Bearing sleeve
Double bearing sleeve made of synthetic carbon with spiral groove for cooling and lubrication of the motor.
- 12** Motor cooling control
Possibility of temperature control in the motor by internal cooling circuit.
- 13** Motor shroud
Made of stainless steel.
- 14** Counter axial thrust bearing
For taking the axial up thrust
- 15** Axial thrust bearing
Lubrication of the slide bearing by motor filling, with individual tilting pads in single thrust bearing for absorption of high axial thrusts.
- 16** Diaphragm
Volume compensation when the motor filling warms up or cool down. Diaphragm less motor via external lubrication also provided.

WPIL Engineered Motors - Parts



Non-return-valve

- No clogging spring loaded or gravity.
- Short closing time avoids water hammer.



Impeller according to pump type in

- Radial design
- Semi-axial design
- Axial design
- From 6" onwards optimal adjustment to the total main . Head by trimming of impellers
- Connection to the pump shaft by means of key



Radial bearing

- Lubrication of slide bearing by motor filling.



Motor shaft sealing

- Mechanical shaft seal
- Sliding surface of a silicon carbide
- High resistance to wear



Current supply cable

- Special resistant for sea water / corrosive water in heavy design.
- Variety of cable materials and constructions available.



Motor

- Filled with drinking water or special filling for optimal cooling of the winding and lubrication of the slide bearings.
- Sizes 6" and 8" with NEMA connection(optimal)
- Sizes 10" and 19" with WPIL connection.
- Designed for max. pump duty.
- Special design for sea water



Axial thrust bearing

- Lubrication of the bearing by motor filling
- With individual fitting pads



Counter axial thrust bearing

For taking the up thrust



Diaphragm

- Volume compensation when the motor filling warms up or cool down.
- By diaphragm of NBR or Viton
- Header tank provided as required.



Heavy offshore design

Heavy, solid cast Duplex Stainless steel design of the submersible pump for long time operation.

Wear resistant Ni-Al-Bronze design possible.

Motor filled with drinking water or special filling for optimal cooling of the winding and lubrication of the slide bearings.

Sizes 4" to 19" dia, with NEMA or WPIL connection.

- Designed for heavy offshore design



Material Combinations

Part Description	Standard MOC	Steel Fitted	Zn.free Bronze Fitted	Nickel Al. Bronze Fitted	316 SS Fitted	Duplex SS Fitted	Super Duplex SS Fitted
Bowls, Suction/ discharge case, nrv body	Cast Iron	steel	Zn.free Bronze Fitted	Nickel Al. Bronze Fitted	Stainless Steel 316	Duplex stainless steel	Super Duplex stainless steel
Impeller	Stainless Steel	Stainless Steel	Zn.free Bronze Fitted	Nickel Al. Bronze Fitted	316 SS	Duplex stainless steel	Super Duplex stainless steel
non return valve	bronze	bronze	Zn.free Bronze Fitted	Zn.free Bronze Fitted	316 SS	Duplex stainless steel	Super Duplex stainless steel
Wear Ring	Stainless Steel	Stainless Steel	Bronze	Bronze	PEEK / 316 SS	PEEK/Duplex stainless steel	PEEK/Super Duplex stainless steel
Pump Shaft	Stainless Steel	Stainless Steel	SS 410	SS 410	316 SS	Duplex stainless steel	Super Duplex stainless steel
Shaft Sleeve	Stainless Steel	Stainless Steel	SS 410	SS 410	316 SS	Duplex stainless steel	Super Duplex stainless steel
pump Bearings	Leaded Bronze/ Cutless rubber	Leaded Bronze/ Cutless rubber	Leaded Bronze/ Cutless	Leaded Bronze/ Cutless	bronze/PEEK	PEEK	PEEK
Motor bearing Housing , adapter, base	Cast Iron	Cast Iron	Bronze	Zn. Free Bronze	Stainless Steel 316	Duplex stainless steel	Super Duplex stainless steel
motor body	steel	Stainless Steel	Stainless Steel 316	Stainless Steel 316	Stainless Steel 316	Duplex stainless steel	Super Duplex stainless steel
motor stator	silicon magnetic steel M47	silicon magnetic steel M47	silicon magnetic steel M47	silicon magnetic steel M47	silicon magnetic steel M47	silicon magnetic steel M47	silicon magnetic steel M47
motor rotor	silicon magnetic steel M47/ copper	silicon magnetic steel M47/ copper	silicon magnetic steel M47/	silicon magnetic steel M47/	silicon magnetic steel M47/	silicon magnetic steel M47/	silicon magnetic steel M47/
motor radial bearings	Leaded Bronze	Synthetic carbon	Synthetic carbon	Synthetic carbon	Synthetic carbon	Synthetic carbon	Synthetic carbon
motor thrust bearings	Tin Bronze	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
seal	double lip seal	mech. Seal/lip seal	mech. Seal/lip seal	mech. Seal/lip seal	mech. Seal/lip seal	mech. Seal/lip seal	mech. Seal/lip seal
winding wire	Polyester/ Hr PVC insulated electrolytic copper	Polyester/ Hr PVC insulated electrolytic copper	XLPE/ Hr PVC insulated electrolytic copper	XLPE/ Hr PVC insulated electrolytic copper	XLPE insulated electrolytic copper	XLPE insulated electrolytic copper	XLPE insulated electrolytic copper
lead cable	Flexible PVC insulated & sheathed tinned copper	Flexible PVC insulated & sheathed tinned copper	Flexible Rubber insulated & sheathed tinned copper	Flexible Rubber insulated, wire meshed & sheathed tinned copper	Flexible Rubber insulated, wire meshed & sheathed tinned copper	Flexible Rubber insulated, wire meshed & sheathed tinned copper	Flexible Rubber insulated, wire meshed & sheathed tinned copper
RTD/ thermister/other	N.A	N.A	Thermister	Thermister	Thermister	RTD/other	RTD/other

Note : Various material/ design combinations custom built are also provided

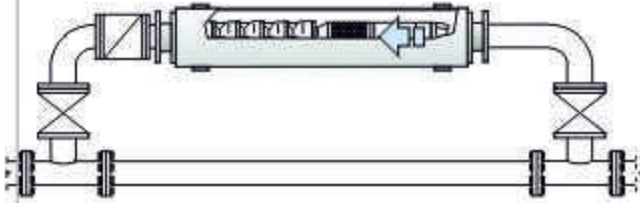
Material standards	IS	Equivalent International Standards	
		BS	ASTM
Cast Iron	Gr. FG 260 of IS 210 (1978)	BS EN 1561-GJL 250	ASTM - A 48 CL 35
Carbon Steel	Gr. 40CB of IS 1570	BS 970 080 M 40	ASTM - A 107 Gr. 1040
SS - CF8M	Gr. 9 of IS 3444	BS1632 Gr. B	ASTM - A 351 Gr. CF8M
316 SS	Gr. 05 Cr 18 of IS 1570	BS 970 316 S16	ASTM - A 276 Type 316
SS (410)	Gr. 12 Cr 13 of IS 1570-5	BS 970 410 S 21	ASTM - A 276 Type 410
Bronze	Gr. LTB2 of IS 318	BSEN 1982- CC 491K	ASTM - B62, B145 Alloy 4A
Al.Bronze	Grade 1 of IS:305		ASTM - B148 B
Ni.Al.Bronze	Grade AB2 of IS:304	95800	ASTM - B148 C
Zn.Free bronze	Gr.2 of IS 28		
Leaded Bronze	Gr. LTB4 of IS 318		
Duplex Stainless Steel			ASTM - A890 4A
Super Duplex Stainless Steel			ASTM - A890 5A

Where,
 IS = Indian standard
 ASTM = American Society for Testing and Materials
 BS = British Standard
 PTFE/Teflon = Poly Tetra Floro Ethylene
 PEEK = Polyethylene Ketone



Installation Configurations

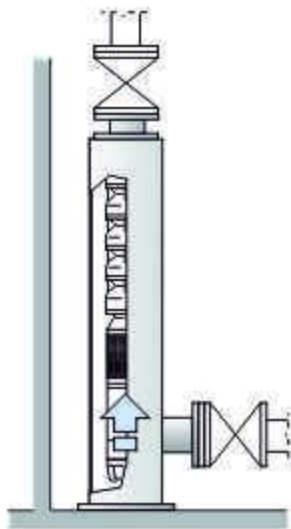
Horizontal , with by-pass



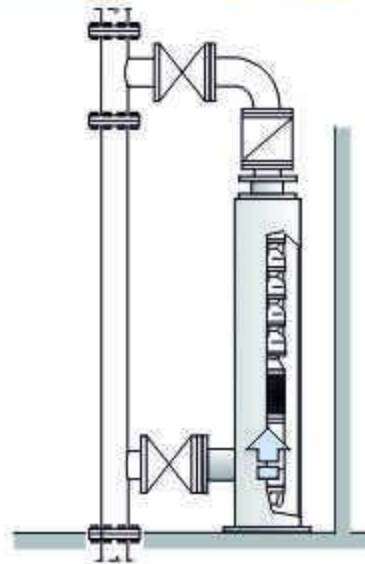
Horizontal, direct mounting



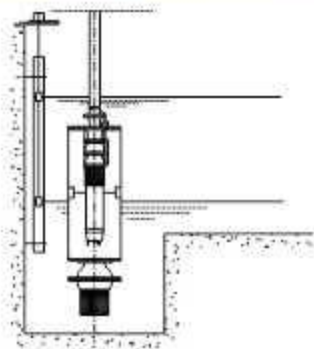
Vertical, direct mounting



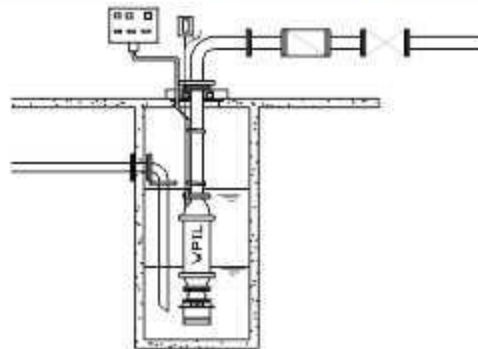
Vertical , with by-pass



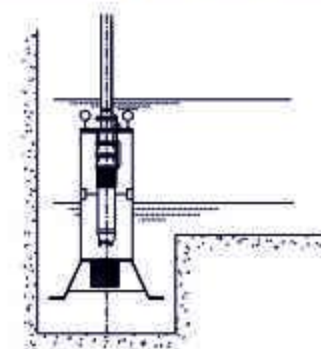
Vertical with motor shroud



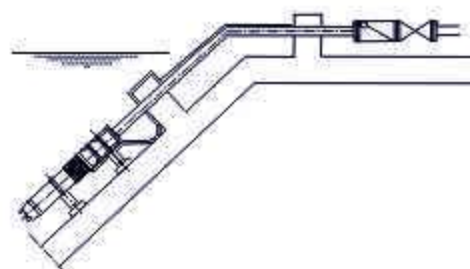
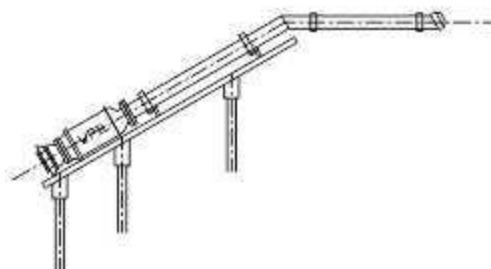
Vertical with motor on top



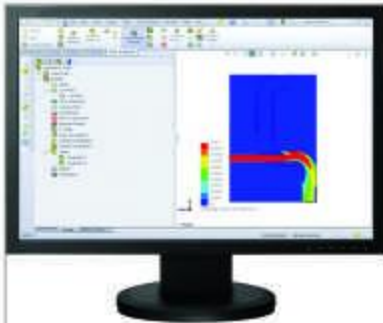
Vertical with pump on top



Inclined & Horizontal



Customer Service



Advisory Service and Planning

Customer advisory service starts with the exact determination of needs in a personal advisory discussion. The specialists in our construction department work out individual solutions of problems.



Calculation of the pipeline

A special program determines all relevant sizes such as geodetical head, head loss, capacity, flow velocity, Reynolds numbers, etc.



Pump selection

If the basic planning data, capacity and head are available, a selection program chooses the right pump.



Calculation of the flow

By using a specially designed software package it is possible to calculate the flow in impellers, casings, intake structures and discharge pipelines.



Pump installation

Installation and complete connection of the submersible motor pumps is done by qualified workers with many years of experience in field installations.



Customer service

Fast and reliable execution of repair and maintenance works including in time supply and delivery of spare parts.

Quality Standards



WPIL Limited
(Formerly Worthington Pump India Ltd.)

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