

PHOTOGRAPHS OF CHARTS ON HYDRAULICS

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| <h3>HYDRAULICS (H - 1)</h3> <h4>HYDRO - ELECTRIC POWER PLANT</h4> <p>WORKING OF HYDROELECTRIC POWER PLANT</p> <p>Most hydroelectric power comes from the potential energy of dammed water driving a water turbine and generator. The power extracted from the water depends on the volume and on the difference in height between the intake and the water's surface. This height difference is called the head. The amount of potential energy in water is proportional to the head. A large pipe (the "penstock") delivers water to the turbine.</p> <p>HYDROELECTRIC POWER PLANT</p> <p>RESERVOIR, DAM, TRANSFORMER, GENERATOR, PENSTOCK, POWER LINES</p> <p>INTAKE CONTROL, PENSTOCK, TURBINE, OUTFLOW GATE</p> | <h3>HYDRAULICS (H - 2)</h3> <h4>PELTON WHEEL</h4> <p>Flow Needle, Buckets, Deflector</p> <p>Pelton Wheel is an impulse Turbine used for high heads of water. It has buckets on the periphery of the runner, into which jets of water are aimed.</p> | <h3>HYDRAULICS (H - 3)</h3> <h4>FRANCIS TURBINE</h4> <p>Shaft, Headcover, Wicket gate, Spiral Case, Draft-tube Liner, Runner, Generator Drive, Water Inlet, Volute Chamber, Guide Vanes</p> <p>The Francis Turbine is an inward flow reaction turbine having radial discharge at outlet. It is mostly used for producing power under medium heads.</p> | <h3>HYDRAULICS (H - 4)</h3> <h4>KAPLAN TURBINE</h4> <p>Water Inlet, Guide Vanes, Volute Chamber, Variable Pitch Blades</p> <p>KAPLAN TURBINE RUNNER</p> <p>The Kaplan Turbine is an axial flow reaction turbine in which the flow of water is parallel to the shaft. A Kaplan Turbine is used where a large quantity of water is available at low heads.</p> | <h3>HYDRAULICS (H - 5)</h3> <h4>CENTRIFUGAL PUMPS</h4> <p>Delivery Pipe, Casing, Suction Pipe, Volute Chamber, Water Entry, Inlet, Outlet, Hub, Driver Side Plate, Vanes</p> <p>GUIDE BLADE OR TURBINE PUMP</p> <p>Types of Vanes: CURVED-BACK VANES, RIGID VANES, CURVED-FORWARD VANES</p> | <h3>HYDRAULICS (H - 6)</h3> <h4>IMPELLERS OF CENTRIFUGAL PUMPS</h4> <p>SINGLE ENTRY</p> <p>ENCLOSED DOUBLE ENTRY</p> <p>OPEN</p> |
| <h3>HYDRAULICS (H - 7)</h3> <h4>EXTERNAL GEAR PUMP</h4> <p>WORKING</p> <p>External Gear Pump consists of two spur or helical gears, which are in mesh with each other, and mounted inside the casing. One is driver and other is driven.</p> <p>Driver Gear, Driven Gear, INLET, OUTLET</p> <p>ADVANTAGES</p> <ul style="list-style-type: none"> • Simplicity and compactness. • Low cost. • A few moving parts. • Less sensitive to contamination. • High operating speeds. • Quite in operation. • Gear pumps are reversible. | <h3>HYDRAULICS (H - 8)</h3> <h4>INTERNAL GEAR PUMP</h4> <p>WORKING</p> <p>A small gear meshing with the larger gear is called the internal gear. The meshing between the two gears, which is in the pocket between the teeth, creates a space for the fluid to be pumped. The fluid is drawn into the pocket and then forced out at the outlet.</p> <p>Outlet, Casing, Internal Gear, External Gear, Crescent Seal, Inlet</p> <p>ADVANTAGES</p> <ul style="list-style-type: none"> • Only two moving parts. • Only one shafting line. • Non-pulsating discharge. • Excellent for high viscosity liquids. • Consistent and even discharge regardless of pressure conditions. • Quietest seal in either direction. <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Common internal gear pump applications include, but are not limited to: <ul style="list-style-type: none"> • All varieties of fuel oil and turbine oil. • Resins and Polymers. • Alcohols and acetates. • Hydraulic Machine tool oil. • Polyurethane foam (isocyanate and polyol). • Food products such as corn syrup, chocolate. • Paint, ink, and pigments. | <h3>HYDRAULICS (H - 9)</h3> <h4>LOBE PUMP</h4> <p>WORKING</p> <p>This pump is similar to external gear pump. It consists of two rotors, one is driver and other is driven. These rotors have very less number of teeth which may be two, three or four and they are in mesh with each other. Due to less number of teeth, higher discharge is achieved.</p> <p>Outlet, Driver Lobe, Driven Lobe, Inlet</p> <p>ADVANTAGES</p> <ul style="list-style-type: none"> • Since the lobe pumps are based on the positive displacement principle, they transfer fixed amount of liquid per revolution. So, you can use lobe pumps for metering applications. • The lobe pumps give more or less constant flow regardless of the discharge pressure as against the centrifugal pumps where flow will vary significantly upon a change in the discharge pressure. • The lobe pumps give higher flow as the viscosity goes up due to drop in slipage. This is the reason why lobe pumps are extensively used when the viscosity of the product changes during processing (e.g. polymerization process). | <h3>HYDRAULICS (H - 10)</h3> <h4>GENERATED ROTOR PUMP</h4> <p>Outlet, Inlet, Outer Rotor, Inner Rotor, Casing</p> <p>This pump has two generated rotors as shown in the figure. One is having external teeth and other is having internal teeth. The rotor with external teeth rotates inside the rotor having internal teeth. The inner rotor is having one tooth less than that of outer rotor. The inner teeth rotor is driven to rotate, the shaft of any prime mover is coupled.</p> <p>Similar to gear (1-2) between the rotor as a pocket. The size of the pocket goes on increasing as the rotor rotates. This more and more of the oil is sucked. After 180° of rotation, further rotation causes the size of the pocket to reduce, causing the oil to flow out of the pocket.</p> <p>Thus, from each pocket, oil is sucked from inlet port during first half of rotation and oil is delivered to outlet port during the next half. There are six such pockets. Three of them are performing suction and while remaining three are delivering the oil.</p> | <h3>HYDRAULICS (H - 11)</h3> <h4>SCREW PUMP</h4> <p>Outlet, Inlet, Pump Body</p> <p>The Screw Pump is a positive displacement pump, which comes with two or three screws.</p> <p>WORKING</p> <p>The inlet as shown in figure is at each end and the outlet is in the middle. While running, liquid fills in the gap between the screws and moves it along with the screws from inlet to outlet.</p> <p>ADVANTAGES OF SCREW PUMP</p> <ul style="list-style-type: none"> • Slow Speed, Simple and Rugged design. • Pumps raw water with heavy solids and floating debris. • No collection pump required. • Gentle handling of biological floc. • Long lifetime (> 20-40 years). • Pump capacity is self-regulating with incoming level. • Easy maintenance (no high skilled staff required). • Constant high efficiency with variable capacity. • Can run without water. | |