



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

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UNIT III: ELECTRICAL SAFETY IN RESIDENTIAL, COMMERCIAL AND AGRICULTURAL INSTALLATIONS

TOPIC: **AGRICULTURAL PUMP INSTALLATION**





TOPIC OUTLINE



Which things are required for installation of pump?

Where should a pump be placed?

What are the procedures in installing water pump?



Why is Agriculture Important in India?

More than 60% to 70% of the Indian population is dependent on agriculture for their livelihood. The agricultural sector provides employment to more than 52% of the total labour of the country. The contribution of agriculture to India's total GDP (Gross Domestic Product) is from 14% to 15%.





Step 1: Choosing the Right Irrigation Equipment

A varied range of equipment affects your product in varying ways since quite some factors come into play - they require different amounts of water and water pressure, depending upon their use and build. Thus, choosing your equipment before selecting your water pump is an essential and precautionary step. Choosing the correct irrigation equipment requires you to consider the controller since it plays an important role in switching the water supply on and off, at specified time intervals, and during specific climatic conditions.

The irrigation controller is crucial and responsible for water conservation by preventing infiltration and run-off materials. In these times, smart pump controlling is gaining a reputation which can determine optimal water requirements, access data such as moisture, rain sensors, and so on to fulfil your crops needs.



Step 2: Consider the water source

Water for irrigation purposes is generally directed from sources such as tube wells, wells, springs or bore wells, surface water from lakes, rivers, reservoirs, and other non-conventional sources of water like drainage water, desalinated water, wastewater, and all the different kinds. Insight on the source helps you decide which pump to go for.



Step 3: Know the Pressure Rate and Flow Requirements

A pump with incompatible or wrong water flow and pressure requirements can lead to drastic pump damage and costly repairs. For any type of pump system, the pump flow rate and pressure are crucial to maintaining your pump's longevity.

Additional Reading: 8 Safety Measures to Consider While Installing a Borewell Water Pump.



Step 4: Finding Distance From Source Of Water

The location of the source from where the water would be directed is an important thing to consider while determining the type of pump.

Go for Turbine pumps and deep-well submersible pumps when drawing water from deep depths like bore wells and such. In the case of surface water, the options are more. Using submersible pumps with groundwater is advantageous since these pumps are not visible and mostly eliminate the chances of robbery and unwanted noises.



Step 5: Finding the Right Pump Size

These are some of the factors that come to play while looking for the correct pump size.

Whether the pump size is suitable for Motor protection.

Whether its number of layers are causing unwanted power consumption

Its system pressure and whether it provides you with variable options for speed control.



Step 6: Calculate efficiency

Calculating the efficiency of pump and motor:

$$\text{Efficiency \%} = \frac{Q \times H}{3.67 \times P1}$$

Where Q = flow in m³/h

H = head (pressure from the pump)

P1 = the kW required

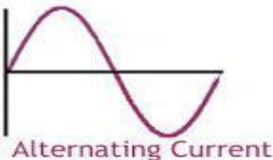




Step 7: System Integration

All the above-mentioned factors are crucial in selecting the correct pump for your needs. By ensuring that the water pressure is not higher than required and by using proper control, you can minimize your energy consumption and cost.

The right water pump will increase not just the total revenue but even ensure better water management for the fertile production of crops.





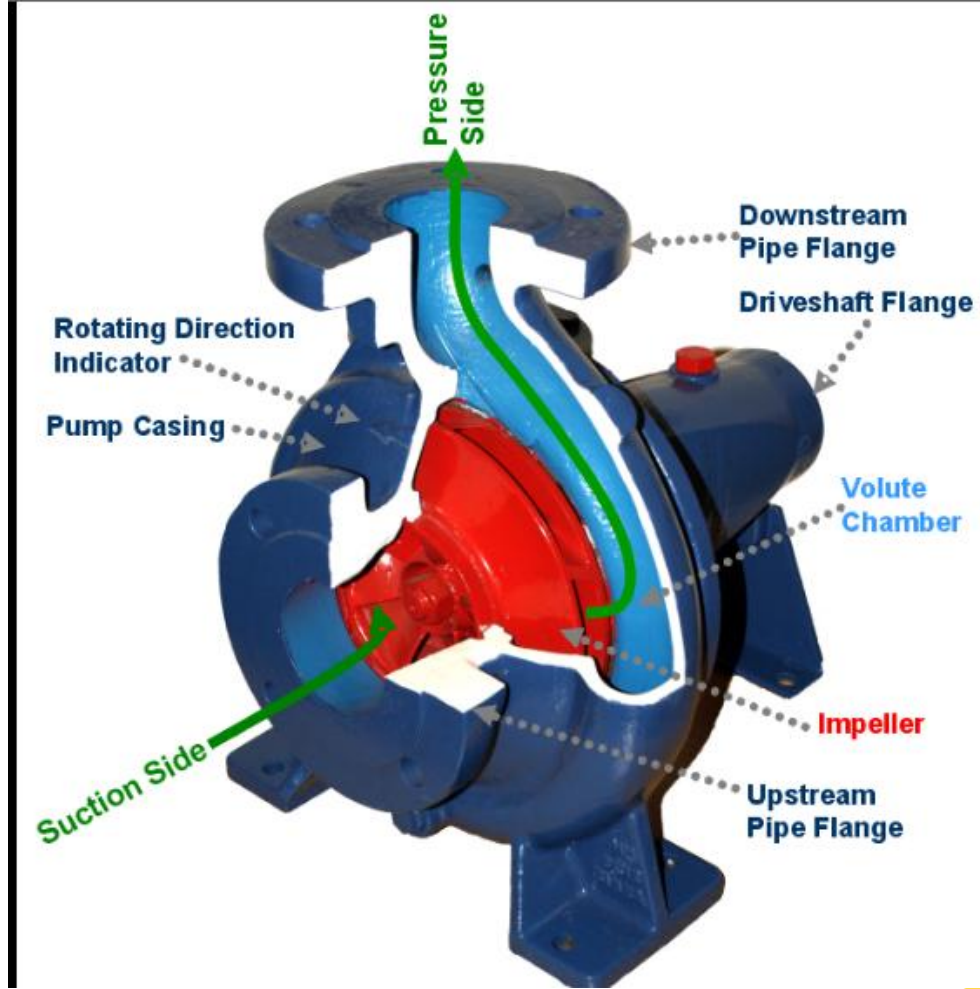
Final Words

Irrigation is the most essential part and it should be carried out perfectly if one wants to yield perfect agricultural outcomes. With proper pumps installed, which are durable, require little to no maintenance, and provide a supple amount of water to the crops. It is necessary, thus, choosing the proper pump, requires basic research and a little session with your professional who is to install it.





Centrifugal pumps are used to transport fluids by the conversion of rotational kinetic energy to the hydrodynamic energy of the fluid flow. The rotational energy typically comes from an engine or electric motor. They are a sub-class of dynamic axisymmetric work- absorbing turbomachinery. The fluid enters the pump impeller along or near to the rotating axis and is accelerated by the impeller, flowing radially outward into a diffuser or volute chamber (casing), from which it exits.

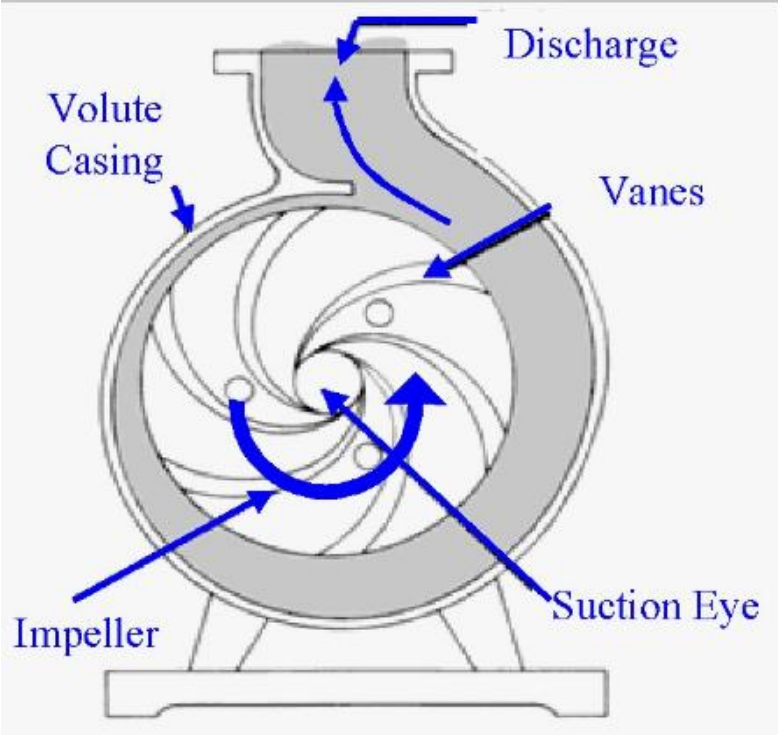




What is impeller in pump?

An impeller is **a rotating iron or steel disc with vanes in a centrifugal pump**. Impellers transfer energy from the motor that drives the pump to the fluid being pumped by accelerating the fluid radially outwards from the centre of rotation.

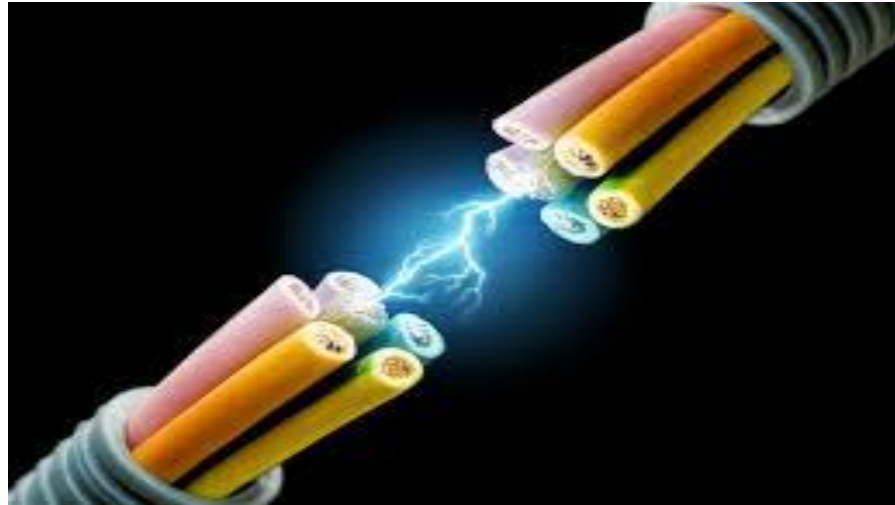








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