

JOB ROLE –PLUMBER (GENERAL)

Sector – Plumbing
(Qualification Pack Code: PSC/Q0104)



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Shyamla Hills, Bhopal – 462013, Madhya Pradesh, India

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UNIT 4: PUMPS AND THEIR INSTALLATION

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Session Objectives

The student will be able to:

- Illustrate the types of pump,
- Define the jet well pump and its types,
- Describe the water meter and its types.

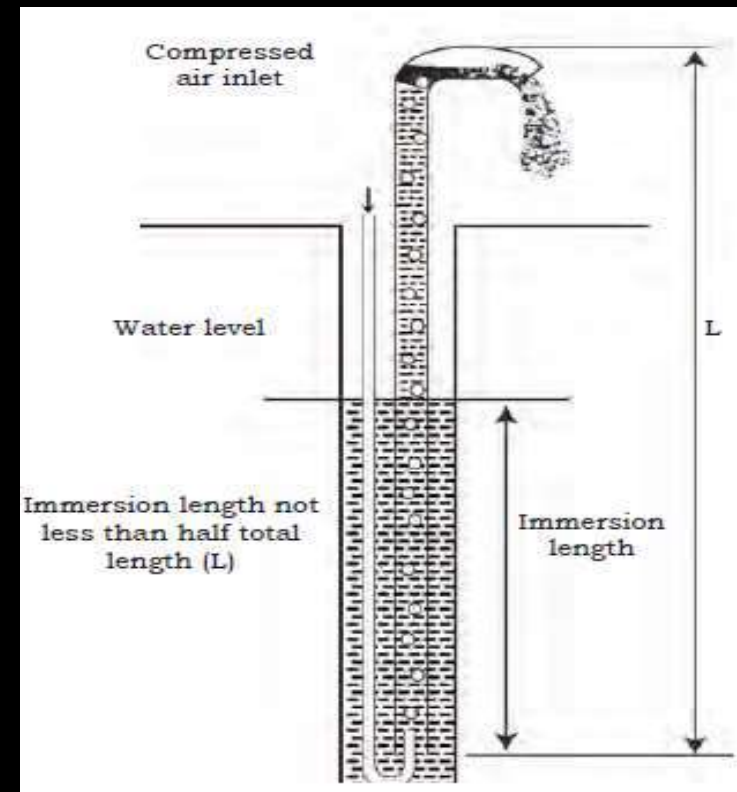
Introduction

- Building of various heights are constructed for both commercial as well as residential purposes. The height of these buildings varies from 15 to 1,000 feet.
- Water is carried with the help of water pumps fitted at the base of the building. A pump is a device that moves fluids (liquids or gases), or sometimes slurries, by a mechanical action.

Types of pump

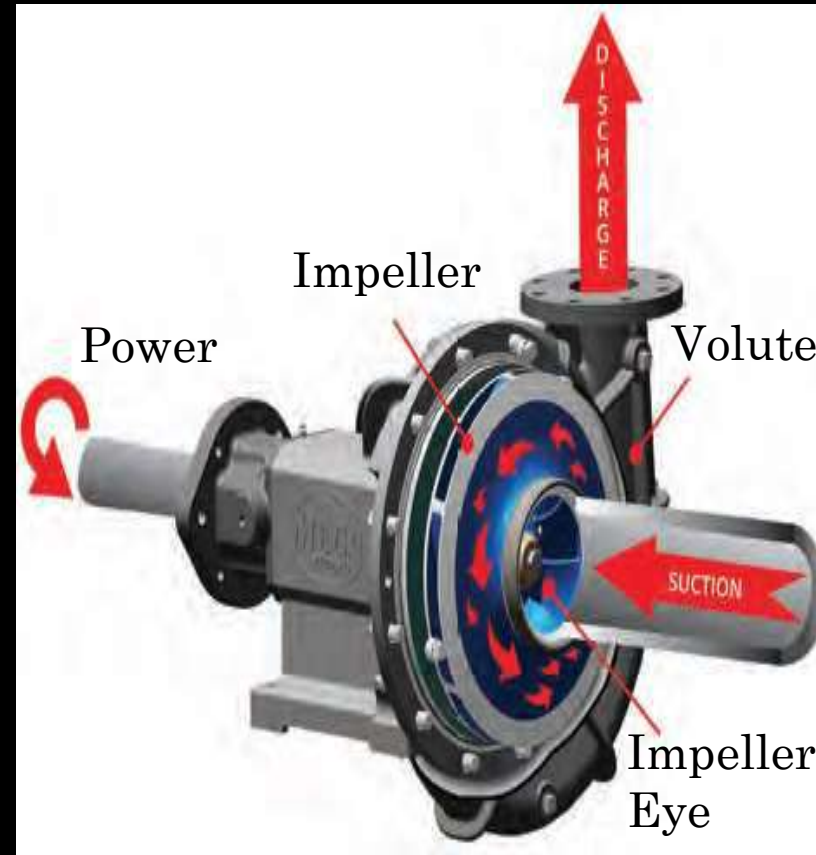
Airlift Deep Well Pumps

- It is reliable and durable pumps are often used in deep dirty wells where the sand is acidic and alkaline. It is also used where simple pumps do not work as they collect more water. The compressed air enters the bottom of the pump and lifts the water above the well.



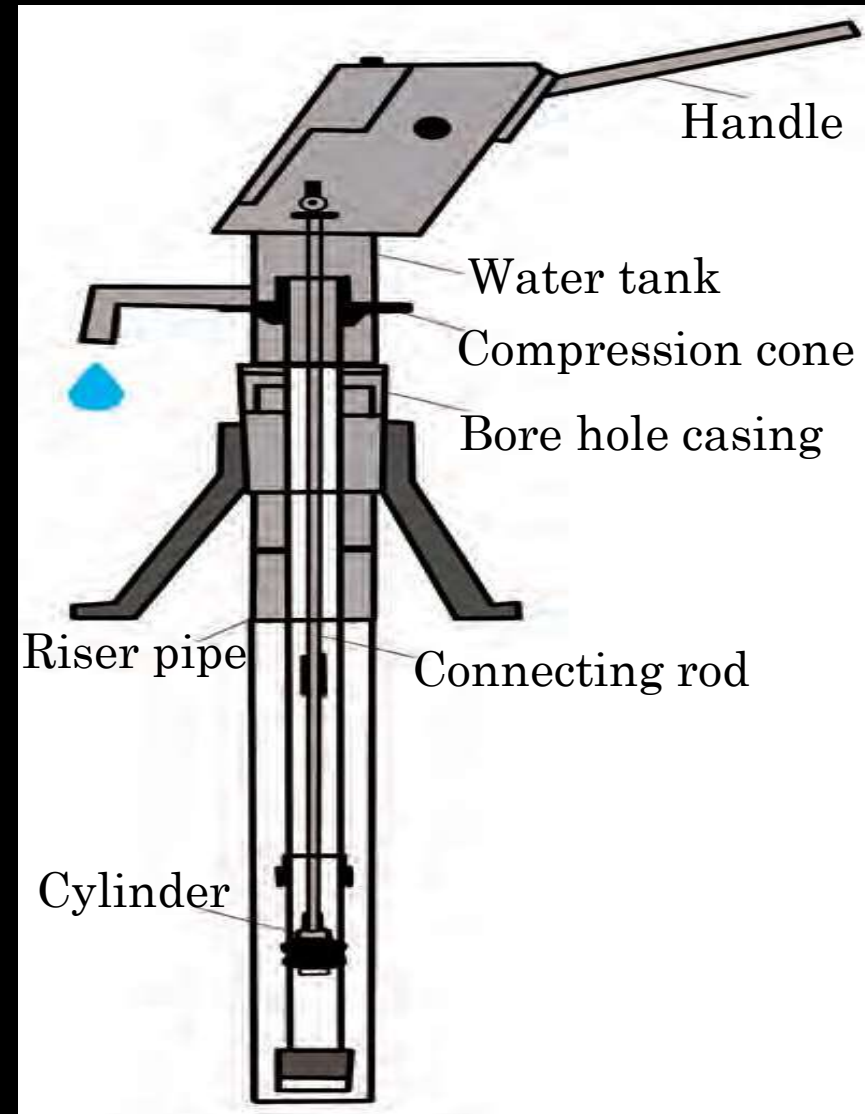
Centrifugal Pump

- These pumps are more useful than other pumps and work on the principle of centrifugal force. They are used to take water and other liquid to a higher level. It is placed where less space is available and available in single stage and multistage.



Reciprocating Pump

- This is also called a hand pump and are mainly used for domestic works. They are often used where a relatively small quantity of liquid is to be handled and where the delivery pressure is quite big.



Jet Well Pump

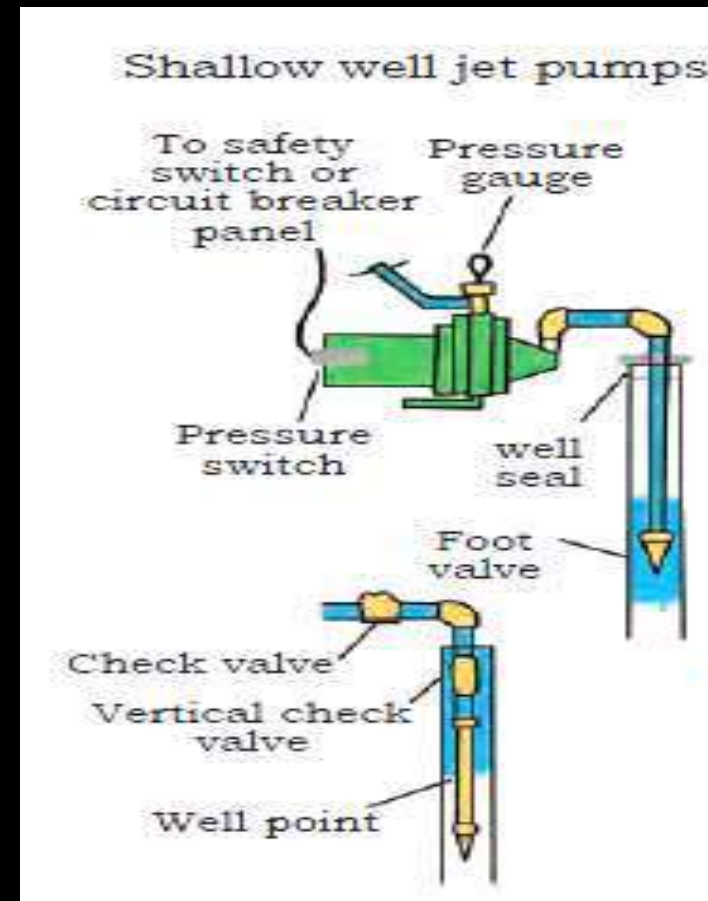
- It circulate water in loop systems and are available in several horsepower (HP) options for different pumping performance rates. It is used in low capacity installation. They deliver water and water pressure to a household, cottage or small sprinkler systems.



Types of Jet Well pump

Shallow well jet pump

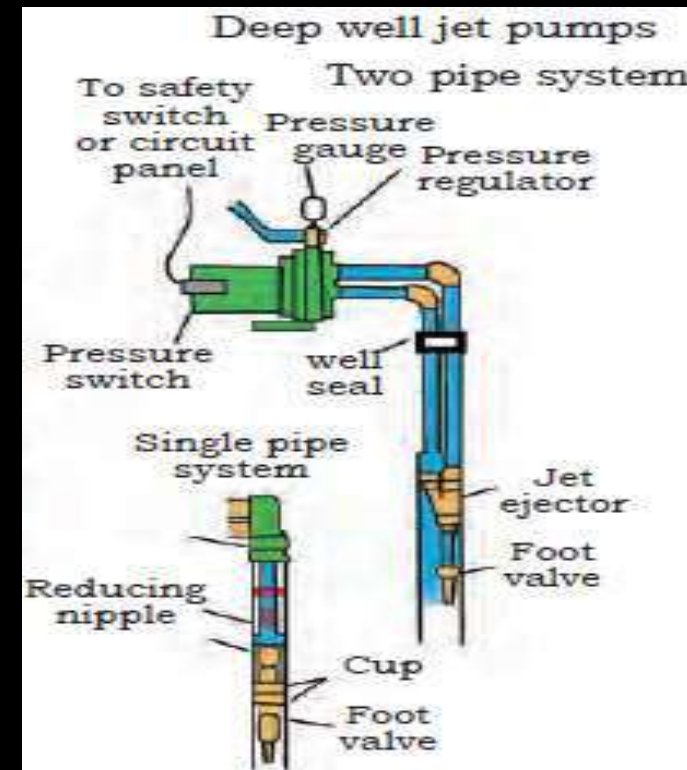
- It is used when the pump is located above the water source, drawing water from a depth of 25 feet or less, vertically. It use a single suction pipe to draw from wells or surface water.



Shallow well jet pumps

Deep well jet pump

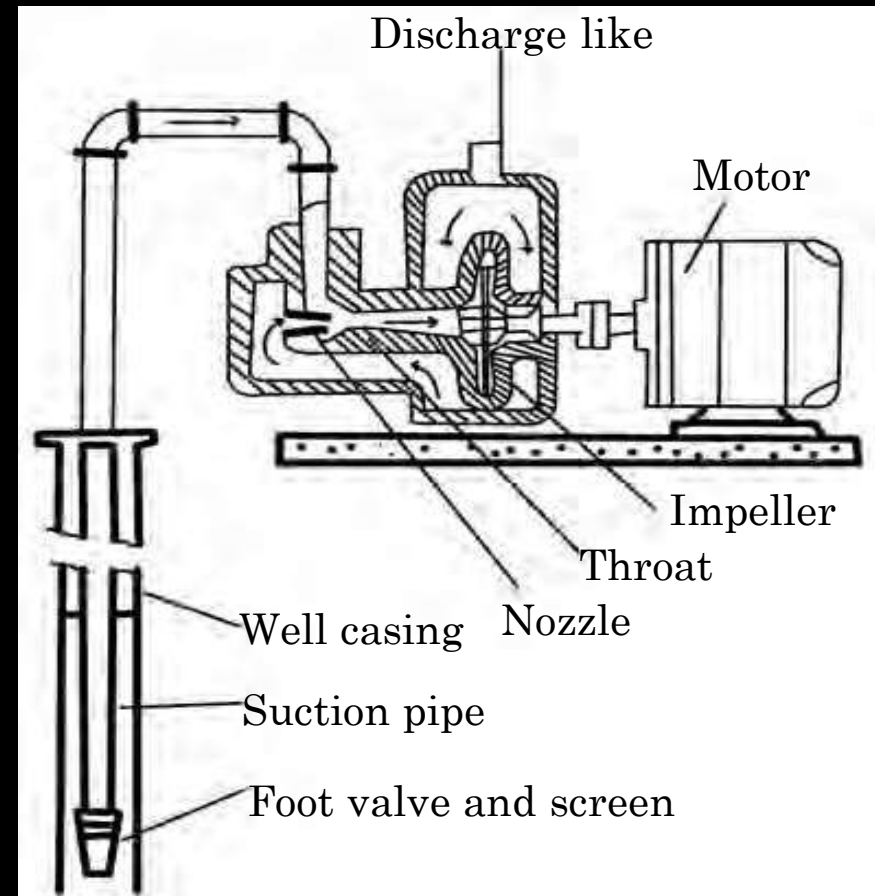
- It is used when the pump is located above the water source, drawing water from a depth of 25 feet to 110 feet vertically.



Deep well jet pumps

Convertible jet pump

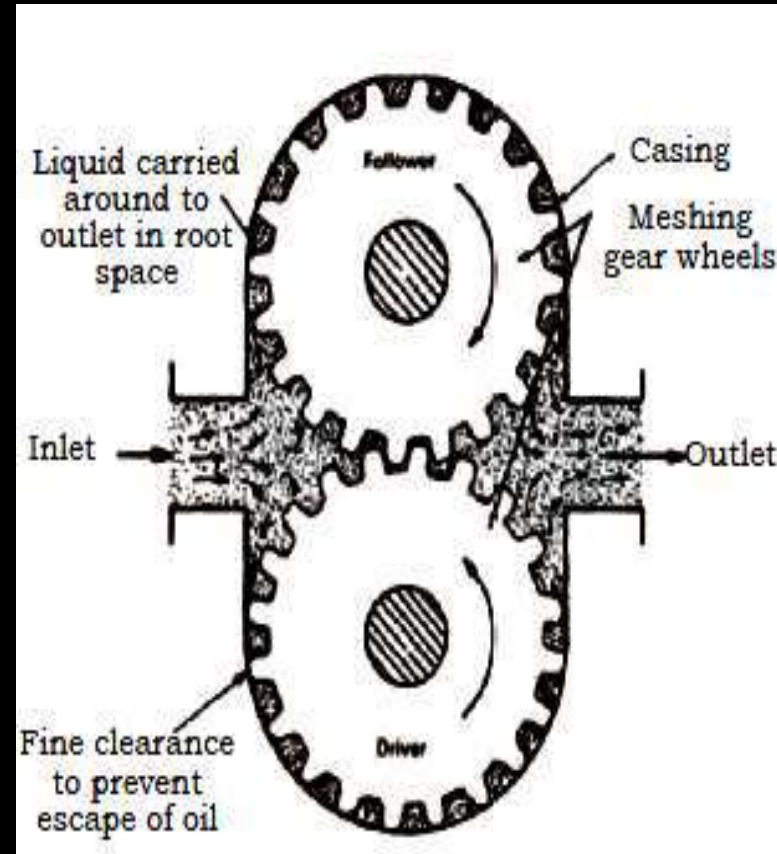
- It is used for deep wells when installed with a jet assembly, built-in or attached to the pump. They are also used when the pump is located above the water source, drawing water from a depth of 110 feet or less, vertically.



Convertible jet pumps

Rotary pump

- In rotary pumps two gears are placed. These gears rotate from the centre. Pump do not have a valve and do not lift water where sand and silt are mixed in water. They pump water without any obstruction and low maintenance cost. Their work capacity is 60 to 80 per cent.



Rotary pumps

Water Meter

- It is a device use to measure the quantity of water consumed by a building or house. Water metering is the process of measuring water use. There are different types of meters to measure different quantities of water.



Water Meter

Advantages

1. This quantifies the amount of water consumed by the people.
2. In conjunction with volumetric pricing, it provides an incentive for water conservation.
3. It helps to detect water leaks in the distribution network, thus providing a basis for the reduction of non-revenue waste.
4. It is a precondition for quantity — targeting water subsidies to the poor.
5. Quantity consumed is generally regarded as the fairest way to pay.
6. This provides a strong signal to users to manage water consumption and reduce wastage.
7. Helps to detect leakage

Disadvantages

1. Uncertainty over to which extent meters actually reduce consumption. The metered customers may be less likely to reduce consumption during times of drought.
2. Potential impacts on affordability, since less well-off customers may limit their use to save money with a consequent risk to health or hygiene.
3. The difficulty of individually metering some properties, such as those with a shared supply.
4. The historic cross subsidy, where the cost of metering has been shared amongst non-metered customers, is gradually exposed. This leaves a smaller proportion of the remaining unmetered customers paying a higher cost.

Types of water meters

Gear Type Water Flow Meter

- Displacement water meters measure how much water occupies a given space over a preset time.
- By doing so, one can estimate the rate of flow of water. These meters are used when the water flows at a moderately low rate.

Velocity Water Meter

- In these meters, the rate of flow of water is determined by monitoring the speed at which the water flows.
- Jet-type water meters are suitable for low flow rate measurements, while turbine-type flow meters are suitable when flow rates are high.

Electromagnetic Water Meter

- Water meters can also measure the flow rate of water by using Faraday's law of induction. Such meters are referred to as electromagnetic water meters and are usually used when one needs to measure unclean or untreated or waste water.

Transit Time Type Water Meter

- Water meters can also be of ultrasonic type in which the rate of water flow is measured by using SONAR technique. Here the sound waves are sent through the flowing water to measure its velocity.

Summary

- In this units, we have covered the knowledge of various types pump and their use in field or building or house, water meter and their types, advantages and disadvantages of water meter.
- A plumber must know the application and installation of pump and water meters.

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