

## 2.2 WATER COOLERS

Water is one of the most needed things for a man. In summer season, cold water gives life to a thirsty man. At 10°C, water is most refreshing. Thus, cooling of water in summer becomes necessary. Water coolers are used to produce cold water at about 7 to 13°C. The temperature of water is controlled with the help of a thermostatic switch. Water cooler may be classified as:

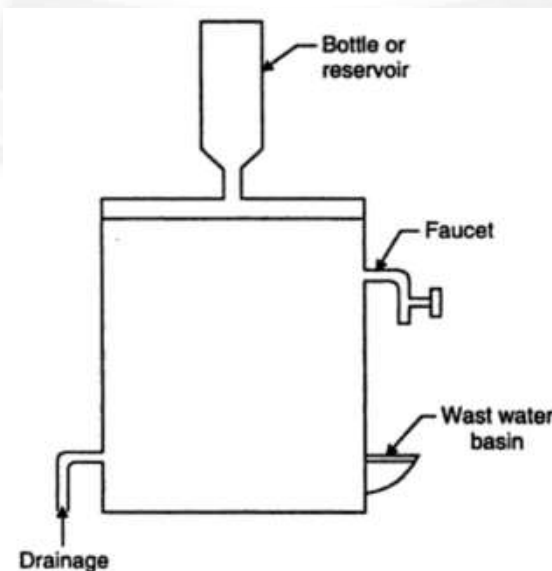
1. Instantaneous type water coolers
  - a. Bottle type cooler
  - b. Pressure type cooler
  - c. Self-contained or remote type cooler
2. Storage type water coolers

### Instantaneous type water coolers

In this type of coolers that cooling coil is wrapped round the pipe line such that by the time water reaches the tank it is cooled to desired temperature. The description of various types of instantaneous type water coolers is given below:

#### Bottle type cooler

In this type water to be cooled is stored in a bottle or reservoir. For filling glass tumblers or containers faucet or similar means are provided. The dripping water from the faucet is collected in the waste water basin or water drip. Its usual size is 25 litres and is suitable for places where plumbing installations is expensive and drains are available.

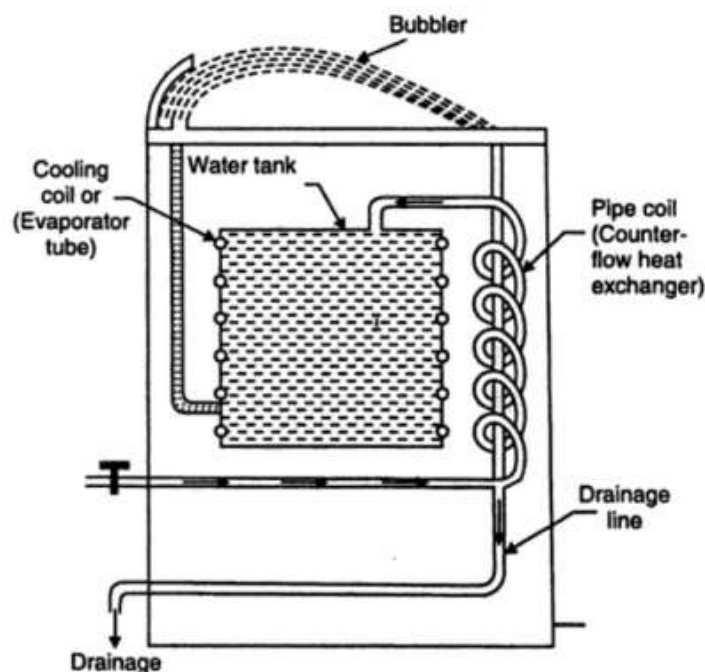


**Figure 2.2.1 Bottle type water cooler**

[Source: "Utilisation of Electrical Power" by R. K. Rajput, Page: 167]

## Pressure type cooler

Here water is supplied under pressure. For filling glass tumblers or containers faucets or similar means are provided. A valve is employed to control an appropriate flow of water or projected stream of water from a bubbler. An arrangement should be made to collect water and allow complete collection of water spreading from the bubbler. The temperature of waste water is low, it is used for cooling the supply water by passing through a pipe coil wrapped round the drainage line. By doing so, the cooling load for cooler is reduced. Since the water is supplied under pressure the cold water can be obtained from the top mounted at any height of the cooler. In case of bottle type, faucet has to be at a height upto which syphoned water can be obtained from the tank of the cooler. The refrigeration system is usually mounted at the bottom structure of the cooler body and a cooling coil is wrapped round the water tank, to ensure good surface contact between the evaporative tube and tank, either the tank surface is corrugated to accommodate pipe or pipes are secured using soft solder to give metal contact. Sometimes, a helical or U-type coil is immersed in the water tank. Although this arrangement gives high heat transfer from water to the coil yet formation of undesirable salt due to chemical reaction between water contaminant and the copper surface proves to be a great disadvantage in this system.

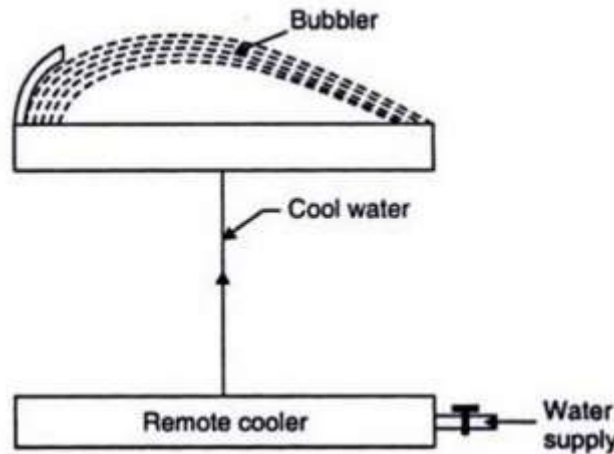


**Figure 2.2.2 Pressure type water cooler**

[Source: "Utilisation of Electrical Power" by R. K. Rajput, Page: 167]

### Self-contained or remote type cooler

This type of water cooler employs mechanical refrigeration system and is a factory assembled unit. A remote cooler cools the water which is supplied to the desired drinking place (away from the system). It is quite a useful unit since it does not require extra space near the place of work.

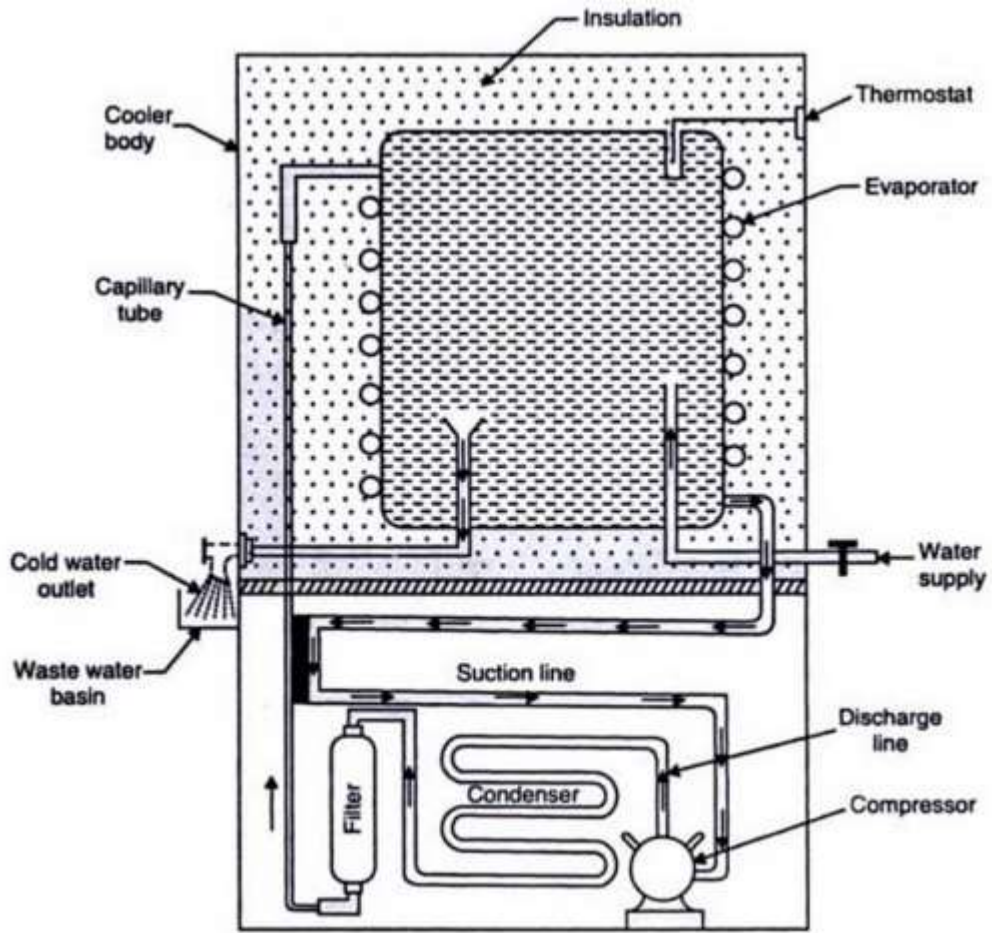


**Figure 2.2.3 Remote type water cooler**

[Source: "Utilisation of Electrical Power" by R. K. Rajput, Page: 168]

### Storage type water coolers

Such type of coolers is used where continuous supply of water is not available. The figure shows a schematic storage type water cooler which is self-explanatory. Here, water is filled in the storage tank and level of the water is kept same by the use of a float-valve. The storage tank is surrounded by an evaporator coil through which flows a low-pressure liquid refrigerant which takes away the heat of water and thus makes it cold. When the water attains desired temperature, the thermostat operates and disconnects the power supply to the motor. The motor used is capacitor-start capacitor-run single phase induction motor.



**Figure 2.2.4 Storage type water cooler**

[Source: "Utilisation of Electrical Power" by R. K. Rajput, Page: 168]