Valves

Ashish Khaladkar

- The distribution pipes are provided with varies pipe appurtenances or accessories so as to make the distribution of water easy and effective.

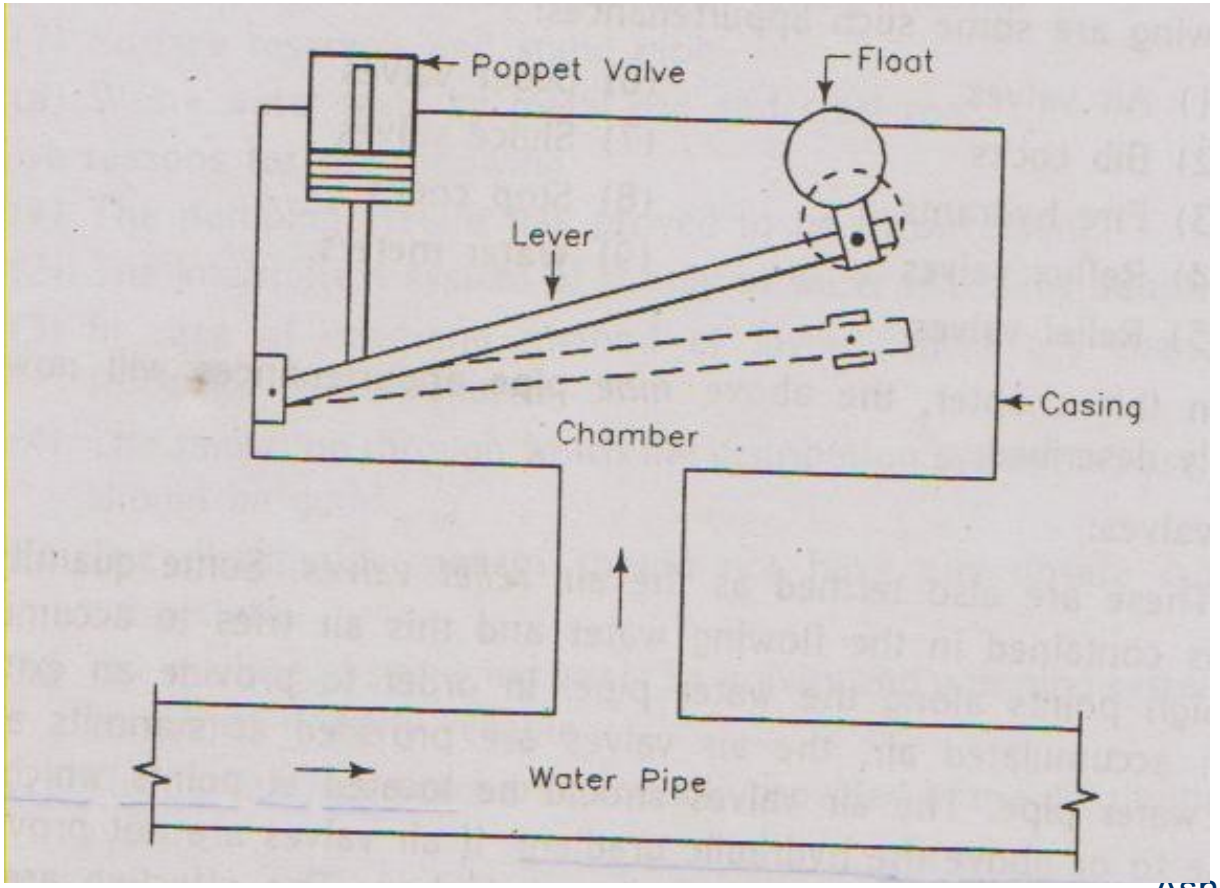
Types of valves

- Air valve
- Bib cock
- Fire hydrants
- Reflux valve
- Relief valve
- Scour valve
- Sluice valve
- Stop cock
- Water meters

- **There are fourteen types of valves for water pipes**
- Stop valve
- Fancy stop valve
- Angle stop valve
- Concealed stop valve
- Gate valve
- Ball valve
- Foot valve

- Air relief valve
- Pressure relief valve
- Scour valve or washout valve
- Sluice valve or Globe valve
- Butterfly valve
- Float valve or Ball cock
- Bib cock / tap

Air Valve



Air valve

- The air valve should be located at point which are close to or above the hydraulic gradient

Why air valves are installed

- If air valve are not provided there are chances for pipes to be air locked. The effective area of flow and consequently the discharged through water pipe are greatly reduced due to air locking.
- The provision of air valve along water pipe also helps in admitting air quickly when vacuum occurs in water pipe due to sudden break down at water pipe at low point.

- Air valves consist of a cast iron chamber, float, lever, and poppet valve. The chamber may be circular or rectangular in shape. A poppet valve is lifted bodily.

working

- The chamber is full of water drawn from water pipe. The float therefore touches the roof of chamber and poppet valve is in a closed position.
- When air from water pipe enters the chamber it starts accumulating just below the roof of chamber. This accumulation of air makes the lever to work and to bring down the float.
- The pulling down of float by lever operates the poppet valve which is then opened .the air is thus allowed to escape through the poppet valve.

- When air escape the water rises again in the chamber and lever works to raise the float. It ultimately results in the closing of poppet valve before escape of water takes place through it.
- The action of air valve is repeated.

Water Hydrant

Water Hydrants

Hydrant

- A hydrant is an out let provided in water pipe for tapping water mainly in case of fire.

Location

- The number of fire hydrants in distribution system and their location depends upon various Factors such as

1. Utility of building
2. Requirement for fire fighting
3. Chances of fire occurrences
4. Population of area

- Generally fire hydrants are placed at all street junctions and they are so located that if a circle of about 60/90 meters is drawn from any hydrant, it will partly overlapping that of the adjoining hydrant

Types of Fire Hydrants

1. Flush hydrants
2. Post hydrants

- Flush hydrants is provided below the footpath or street level and protected or covered by a cast iron or brick masonry chamber. The flush fire hydrants are more attached to the water pipe and can not therefore be easily dislocated.

Water Hydrant

Ashish Khaladkar

- A post hydrant are provided projecting above the road level and its height above road level is about 1 m to 2 m this type of hydrants are more prominent and can easily located when a fire occurs

Working

- When a nut is operated by a key, a valve goes up and it allows the water from the outlet .the diameter of outlet should to correspond to the diameter of hose to be attached to it. The usual diameter of outlet is about 60 mm and so.

Requirements of Good Fire Hydrant

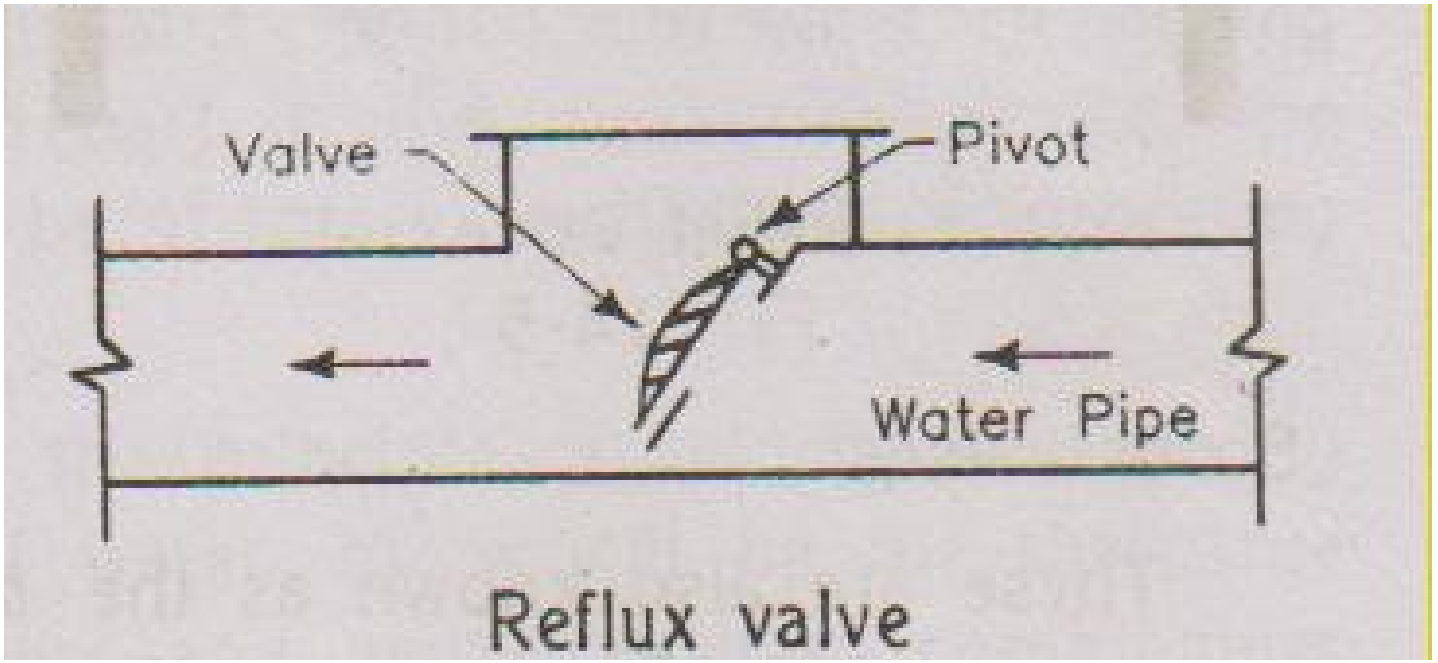
1. It should be cheap
2. It should be easily detectable in case of fire
3. It should be such nature that it can be easily connected with the hose or motor pump
4. It should be functioned properly and should not go out of order during operation
5. It should permit undisturbed flow of water when being fully opened

Reflux Valve

Reflux Valve

- Reflux valve are also known as check valve or non return valves (NRV).
- A reflux valve is an automatic device which allows water moves in one direction only

Reflux Valve



Reflux valve

Working

- When water moves in the direction the valve swing or rotates around the pivot and it is kept in an open position due to the pressure of water. When flow of water in this direction cease. The water tries to flow in a backward direction, but in this case the valve occupies its seat and thus prevents the passage of water in the reverse direction.

Location

- The reflux valve is invariably placed in water pipe which obtains water directly from pump fails or stop. The water will not run back to the pump and thus the pumping equipment will be saved from damage. Similarly at inter connection between a polluted water system and a potable water system, the provision of reflux valve will prevent the entry of polluted water into pure water.

Water Meter

Water Meter

- Water meters are installed on pipes to measure the quantity of water flowing at a particular point along the pipe.

Types Meters

- The water meters can be classified into the following two categories.

1. Positive displacement type meters
2. Velocity meters

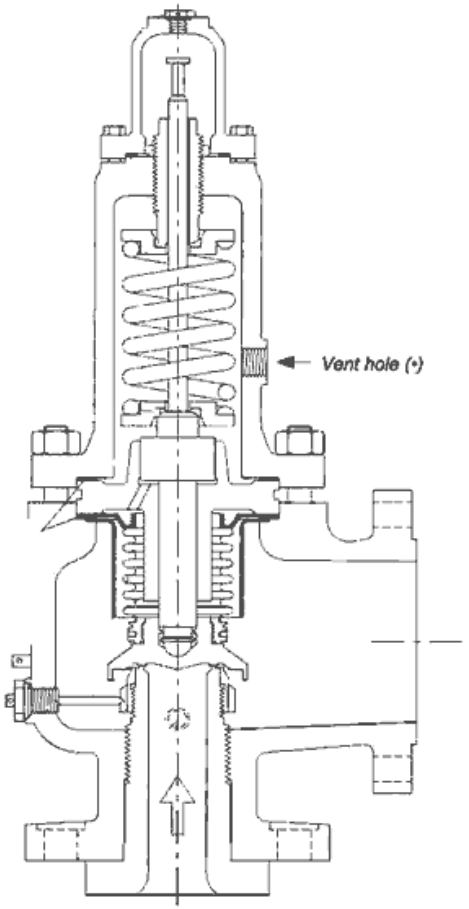
- The positive displacement type meters records the number of times a container of known volume is filled and emptied with water, depending upon the motion of a moving part in the measuring device. The positive displacement device may be rotary, oscillating, reciprocating or notating disc type meters.

- The velocity meters works on the principle of velocity of entering water and higher the velocity more will be the discharge through meter. Thus turbine meters and venturi meters comes under this category.

The Requirements Of Good Water Meters.

1. It should accurately measure the discharge of water to the permissible tolerance of about 2%
2. It should be capable of registering even small quantity of flow of water
3. It should be easy to repair and to maintain in a good working condition
4. It should not be too costly
5. It should contain an arrangement in the form of a screen at the inlet so that the entry of grit is prohibited.
6. It should not offer any resistance or obstruction to the natural flow of water.
7. The entire assembly of the meter should be non corrosive

Relief Valve (Globe Valve)



The Relief Valve

- The **relief valve** (RV) is a type of valve used to control or limit the pressure in a system or vessel which can build up by a process upset, instrument or equipment failure, or fire

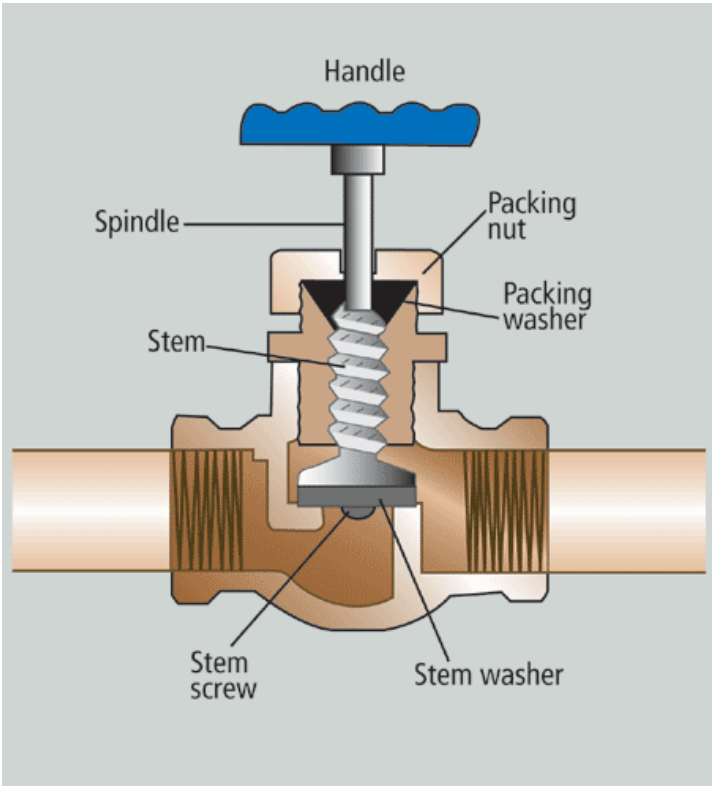
Or

- Pressure relief valves perform the vital role of limiting the air or fluid pressure or vacuum in a system. Designed to open at a predetermined pressure, relief valves protect your system from over or under pressurization.

Working

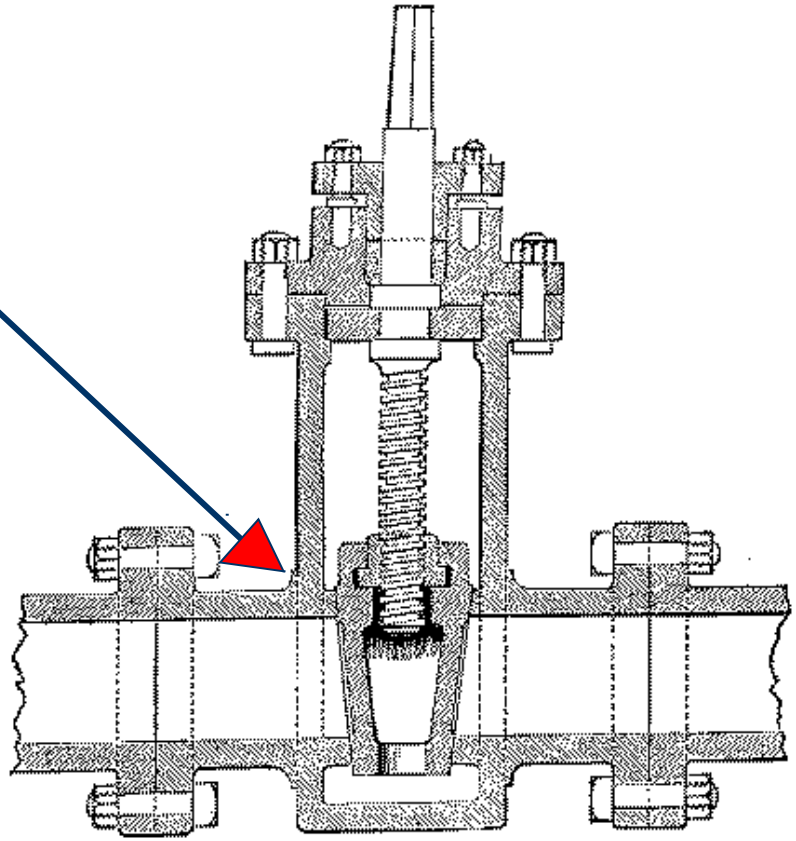
- When the safe pressure of a system is exceeded, the relief valve opens and air or fluid is diverted through this auxiliary route – thus protecting your system from pressure that has exceeded the safe pressure range.
- Once the pressure reaches safe levels the relief valve will close allowing normal operation of the system to continue, with the relief valve ready to operate again.
- Pressure relief valves are also known as vacuum relief valves, blow-off valves, pop-off valves, pressure regulating valves, safety valves, and purge valve

Gate Valve


Handle
Spindle
Packing nut
Packing washer
Stem
Stem screw
Stem washer

Gate Valve

Wedge shaped Gate



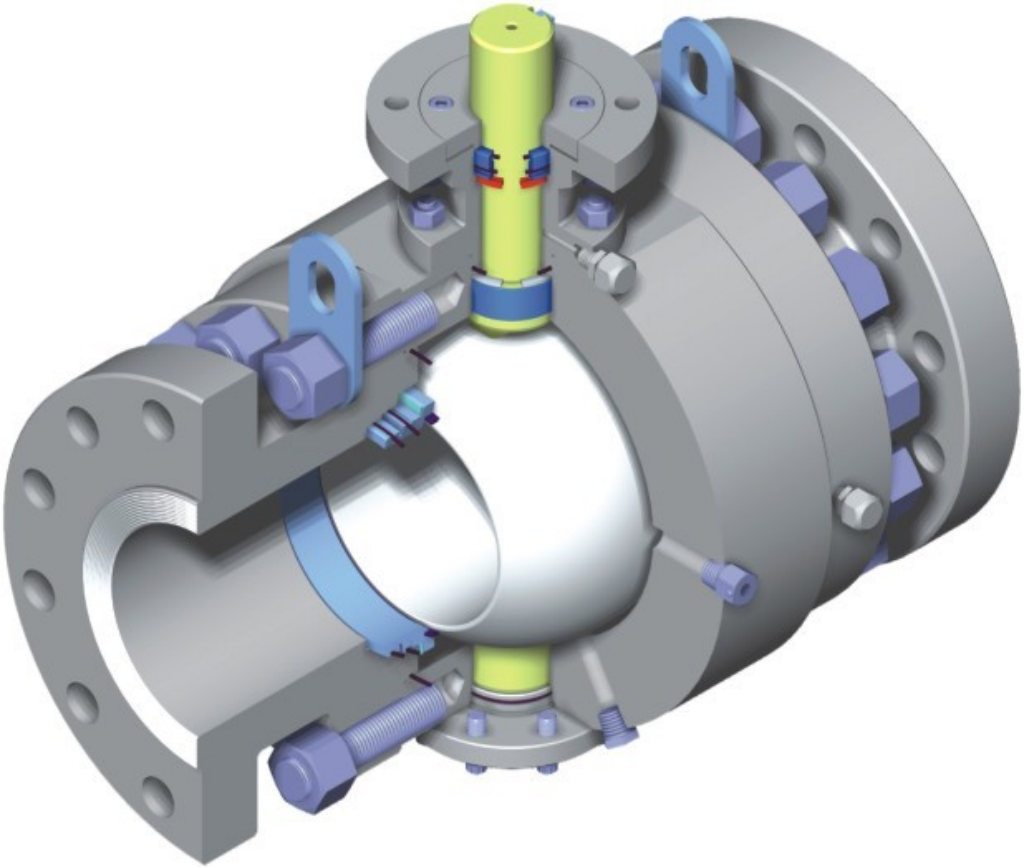
Main Pipe

Foot Valve

Foot Valve

- It is a valve placed at the bottom of the suction pipe of the pump·
- It allows the water to enter the suction pipe when it is opened.
- It prevents water from flowing back when it is closed.

Ball Valve

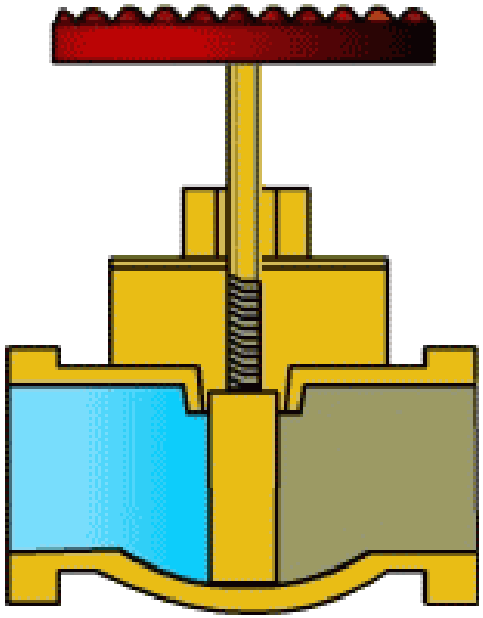


Ball Valve

- Ball valve or float is an automatic flow control device.
- In this valve the regulating principle is the level of some free water surface.
- Ball valves are used in the underground storage tank, flushing cistern etc. to regulate the flow of water automatically·
- The ball valves are of nominal sizes 15 mm, 20 mm, 25 mm, 32 mm, 40 mm and 50 mm.

Gate Valve

Gate Valve



Gate Valve Closed

Gate Valve Opened

Gate Valve

Gate Valve

- Gate valve is a full way valve which is inserted in a pipeline for controlling or stopping the flow of water.
- It offers lesser resistance to the flow of water.
- Hand wheel closes the valve by turning it in clockwise direction.
- Its nominal sizes are 15 mm to 100 mm.

Concealed Stop Valve

Concealed Stop Valve

- It is used to regulate the supply of hot and cold water to shower, mixer etc. in concealed plumbing line.

Angle Stop valve

Angle Stop valve

- It is a valve with inlet and outlet at right angles to each other.
- It is used to stop the supply of water to geyser, flushing cistern and the wash basin etc.
- These valves are used for servicing of water fitting to be carried out without having to shut off complete water supply of the house.

Fancy stop valve

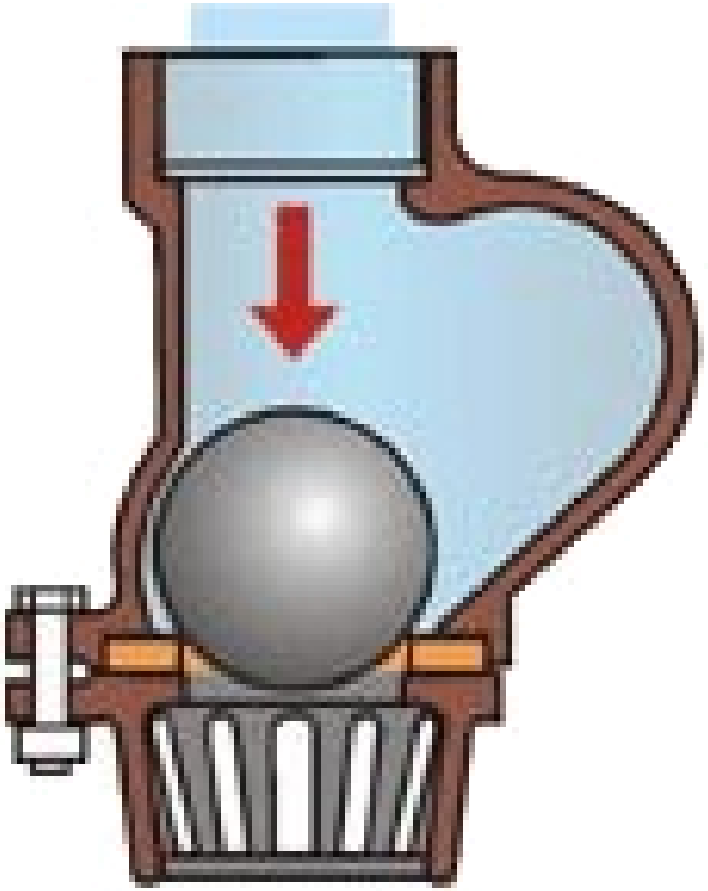
- These valves are available in normal sizes of 15 mm and 20 mm.
- It is also called open stopcock.

Stop Valve

Stop Valve

- This valve is suitable means of connections for inserting and controlling the flow of the water.
- Nominal size of stop valve is designated by the nominal bore of the pipe to which valve is normally fitted.
- Its body and the bonnet are made of cast brass.
- In large buildings, sufficient numbers of stop valves are fixed on the branch pipes to minimize the interruption of the supply during repairs·
- A stop valve is also called stopcock· Stop valves are of two types
  a) Internally threaded
  b) Externally threaded.

Float Valve Or Ball Cock



Float Valve Or Ball Cock

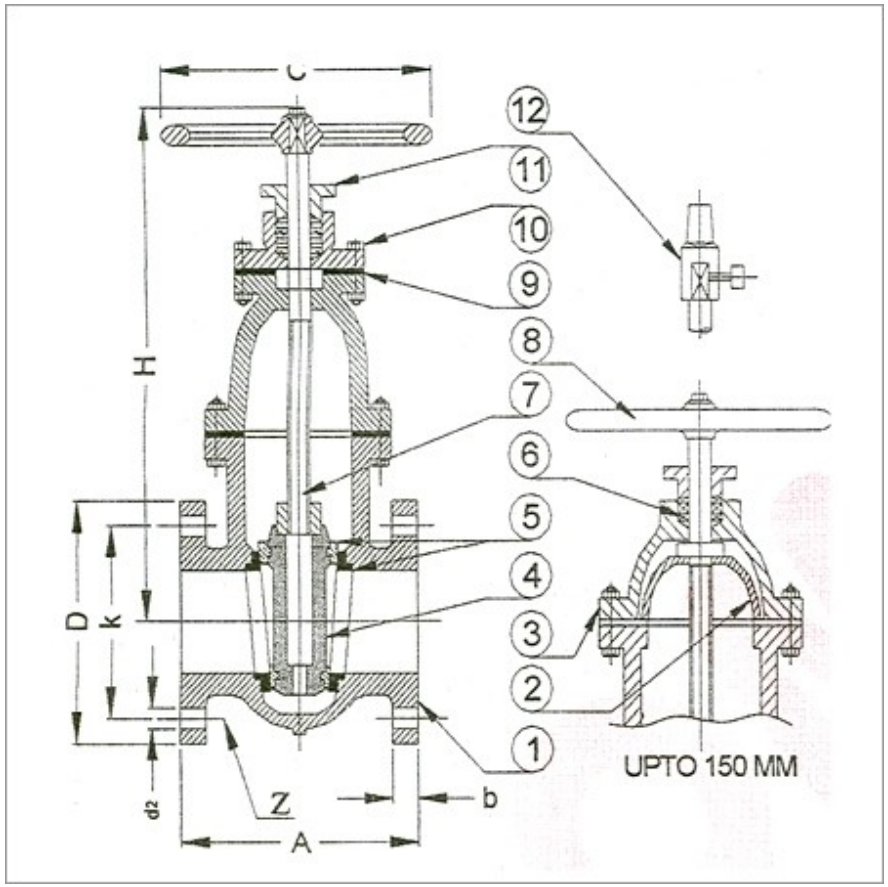
- These valves are used in water tanks and in the cisterns to maintain constant water level and prevent overflow.
- It is activated by means of a lever and float (ball).
- The rise and fall of the ball controls the flow of the water.
- They are generally made for high pressure, medium pressure and for low pressure.

Butterfly Valve

Butterfly Valve

- The valve contains a circular disc which rotates to the direction of flow in the pipe.
- A butterfly valve is a type of flow control device used to regulate the fluid flowing through a section of pipe.
- The valve is similar in operation to a Ball Valve.
- A flat circular plate is positioned in the center of the pipe.

Sluice Valve Or Globe Valve



Sluice Valve Or Globe Valve

- These valves are used to control the flow.
- Globe valves are used for the control and frequent operation.

Score Valve

Scour Valve Or Washout

- These valves are used at the valley point to clean the pipe line.

PRESSURE RELIEF VALVE :-

- It is used to protect pipe from sudden increase in the pressure due to water hammer (beat) because of closing the valves.
- It is a device attached to a boiler or other vessel for relieving the pressure of steam automatically before it becomes great enough to cause bursting.

Air Relief Valve

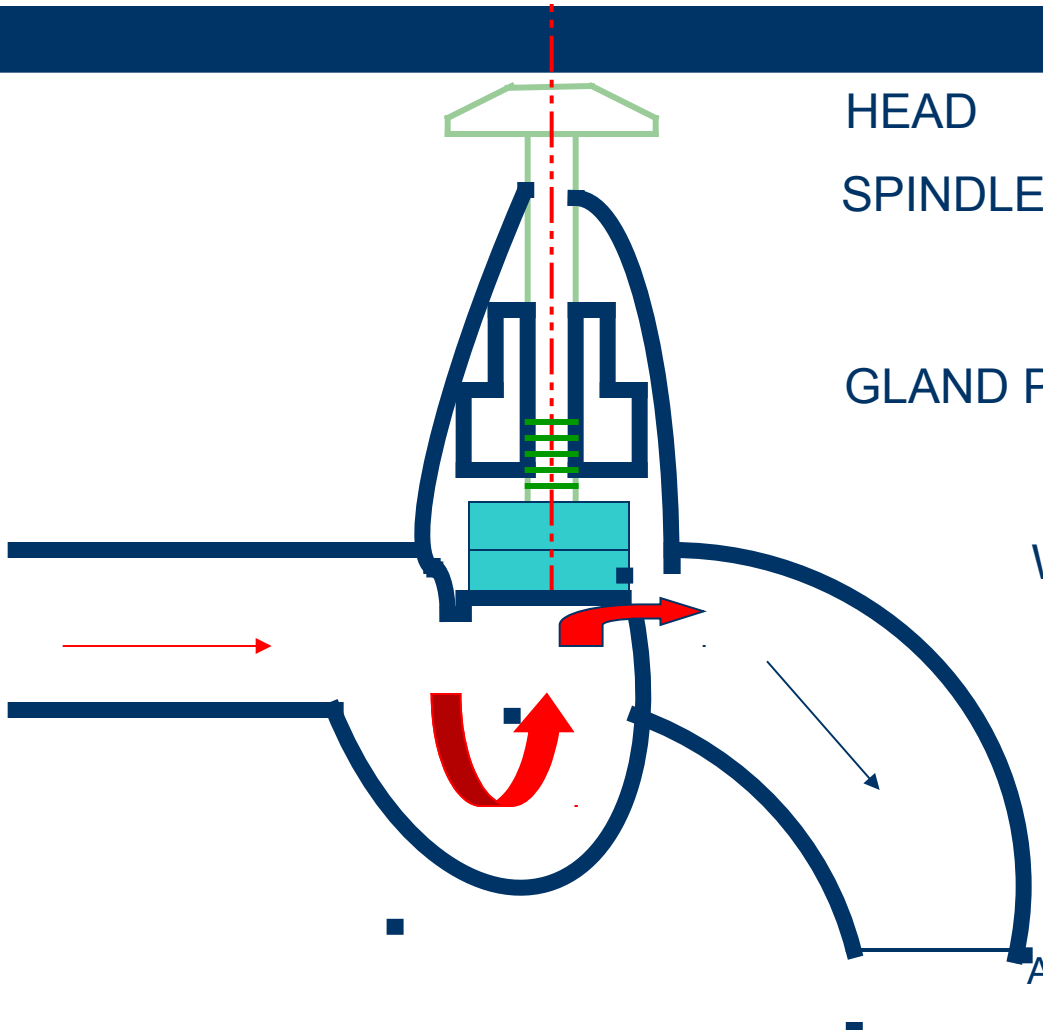
Air Relief Valve

- The air-relief valve is an integral part of a pool from pumping and filtration system.
- As the pools pump sucks out water from the pool, the water is forced through a filter.
- This water is then forced through the air-relief valve.

TAPS OR BIB COCK

- These are placed at ends of water pipes to draw off water from pipe.
- This is normally screw down type & opens in anti-clockwise direction. When its of push type, it works automatically and normally used in public places

Taps Or Bib Cock



Laundry Faucet

Kitchen Sink Mixer

Pure Water Faucet

Taps Or Bib Cock

- These are the water taps which are attached at the end of water pipes & from which the consumes obtained water. The bib cocks are available in various shapes. It is operated from a handle & when handle is turned, the opening from which water comes out , gets increased or decreased in size.


PC-CS
Pillar Cock "CAMRY SPL"
with Wall Flange
AC-CS
Angle Cock "CAMRY SPL"
BC-CS
Bib Cock "CAMRY SPL"
with Wall Flange


SELF TIMER FAUCETS
STF-PC
Pillar Cock Self Timer
STF-FV
Flush Valve Self Timer
STF-BC
Bib Cock Self Timer
STF-AC
Angular Cock Self Timer (for Urinals)

Thank you