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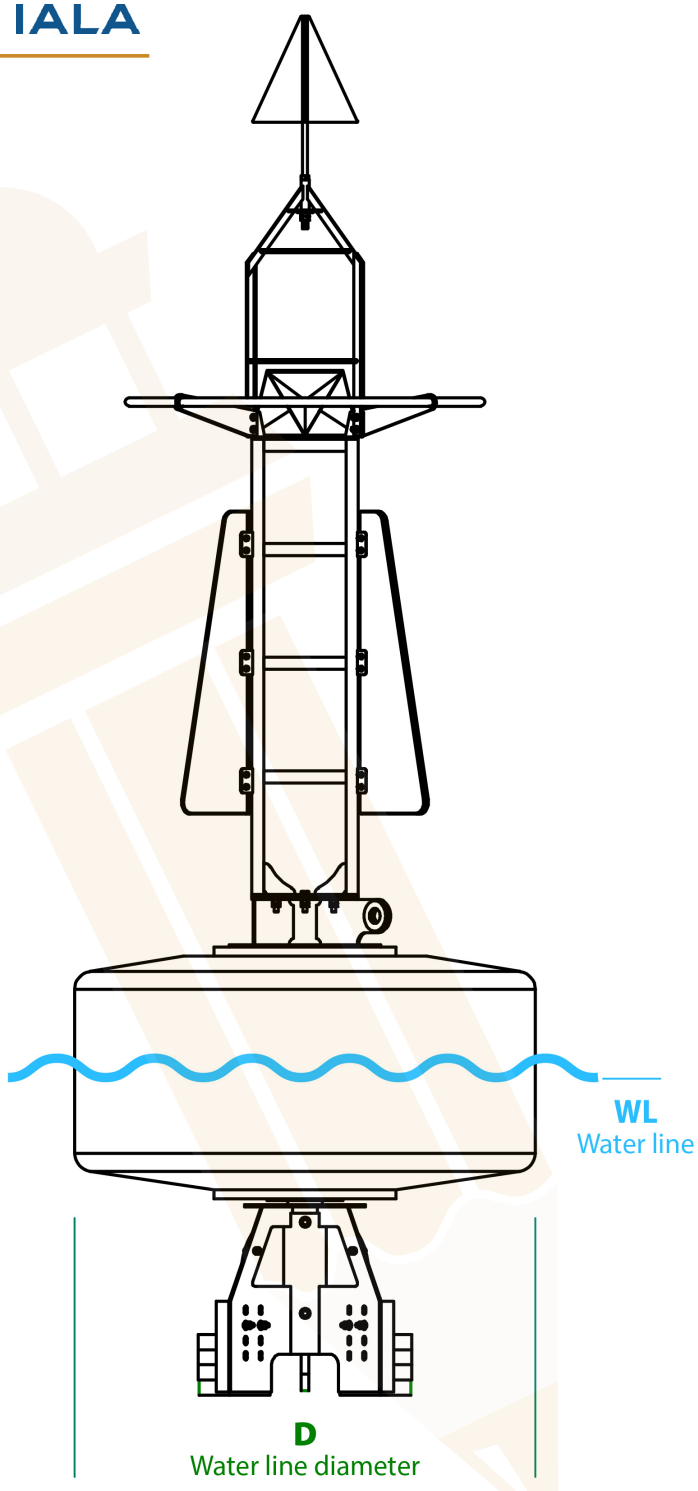
VOLUME

The body of the buoy forms a closed volume that provides the buoyancy of the buoy when immersed in water. The total volume is defined as V (measured in m³).

WATERLINE AND WATERLINE DIAMETER

The waterline (WL) is the horizontal line that divides submerged and dry parts of the buoy. The diameter of the waterline (D) is the diameter of the buoy body measured on the waterline (in meters).



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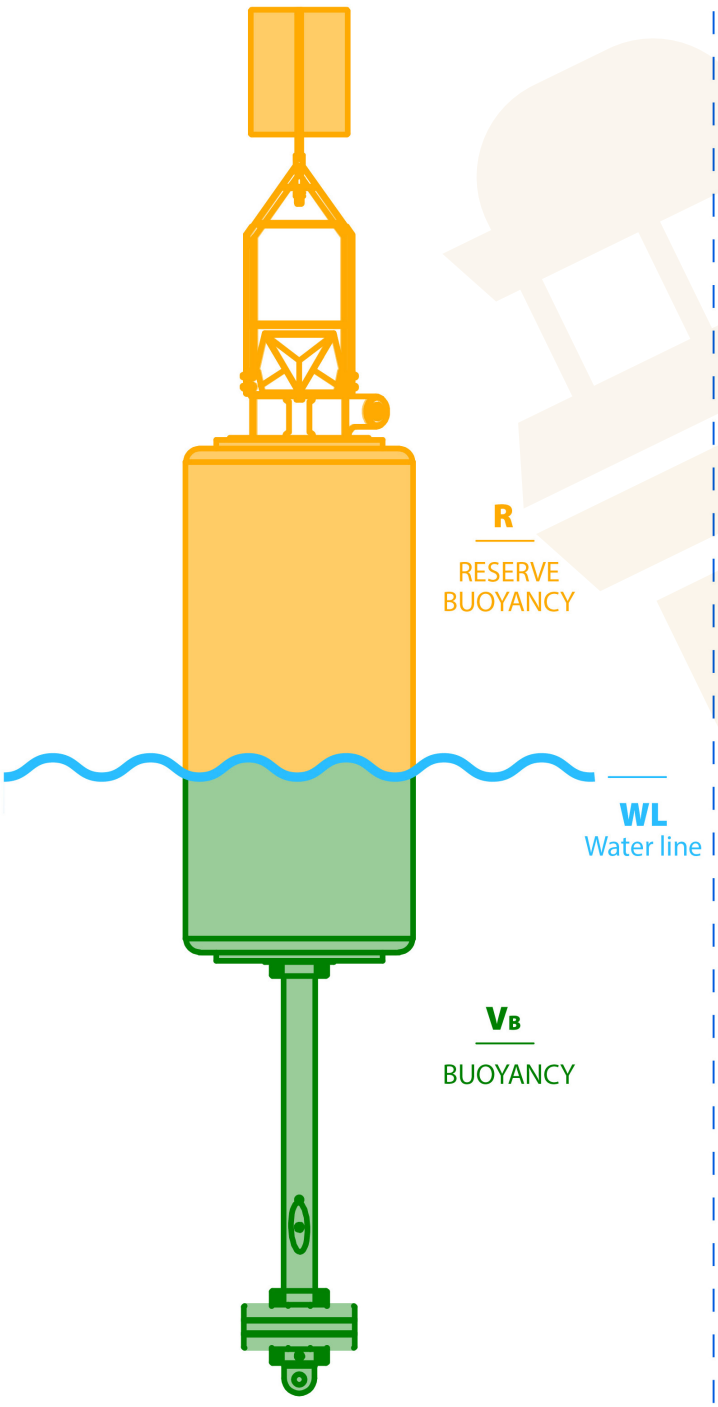

DISPLACEMENT

BUOYANCY, RESERVE BUOYANCY AND DISPLACEMENT

Buoyancy (V_B), measured in m^3, is the total volume of all the components of the buoy submerged below the waterline.

On the other hand, reserve buoyancy (R), measured in m^3, is the total volume of all the components of the buoy that remain above the waterline. It can also be expressed as a percentage of the total volume.

Displacement (in Kg), is the total volume of the buoy (buoyancy plus reserve buoyancy) multiplied by the density of water.

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WEIGHT

Weight (W) is the vertical force of gravity downwards, applied on the gravity center of the buoy.

CENTRE OF BUOYANCY

Then center of buoyancy is the centroid of the displaced volume of water, it is, therefore, where the buoyancy force is applied. The position of this center, varies greatly with loads, rolling, draft and other movements of the buoy. It is usually defined by a vertical distance from the waterline.

CENTRE OF GRAVITY

The center of gravity is the application point of overall weight, also, the centroid of all the masses present in the buoy.

Centre of buoyancy and gravity, his positions and the distance between them, are really important in order to evaluate buoys stability. We will expand this information in the following articles.