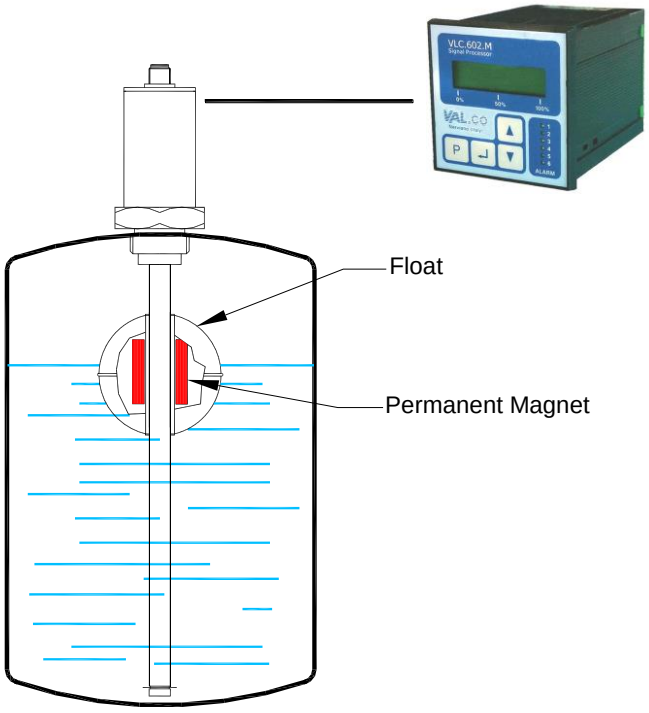
TECHNOLOGY



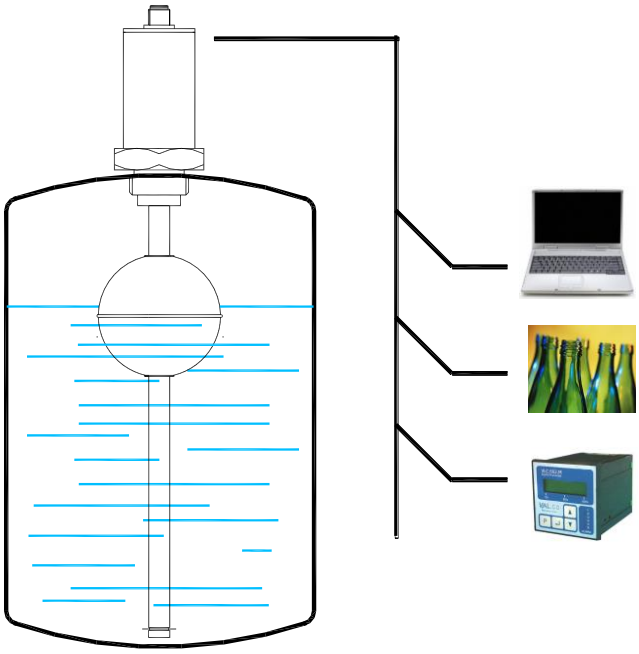
Theory

The magnetostriction is a physical phenomenon that occurs in ferromagnetic materials such as nickel, cobalt and their alloys. It consists in the mechanical deformation of a magnetostrictive element when it is magnetized or it is varied its magnetization.

Physical principle

The application of the **magnetostrictive** effect in industrial applications, are based on the principle called Wiedemann effect:
sending an electrical current pulse in a waveguide of magnetostrictive material, generates a circular magnetic field around it.
Along the waveguide is positioned a permanent magnet that generates a magnetic field, perpendicular to the first.
at the exact meeting point between the two magnetic fields, a mechanical wave is generated in the waveguide, due to the magnetostrictive torsional deformation.
This wave is propagated in the waveguide at the sound speed, characteristic of the magnetostrictive material.

APPLICATIONS AND FIELDS OF USE



- Accurate and continuous monitoring of the level, insensitive to: presence of foam, variations of dielectric properties, and conductivity of the fluid.
- Remote transmission of the level state through current and voltage signals.
- Linear measurement of the level, independent of the shape of the tank.
- Centralized storage plants.
- Control of drinking water and fuel on boats.
- Centralized lubrication systems.
- Water treatment plants.

ADVANTAGES

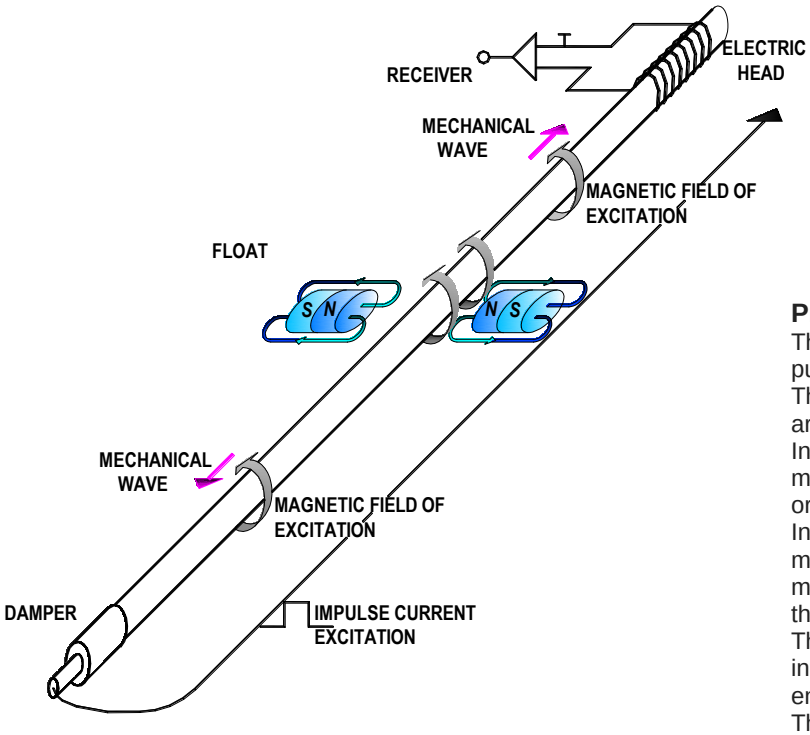
- Accurate and continuous level monitoring.
- Sizing of the instrument according to customer requirements.
- Maintenance free.

SYSTEM DESCRIPTION

Mechanical construction

The sensor is composed by:

- An electric head consisting of a microprocessor electronic circuit placed in an aluminum enclosure.
- A waveguide of magnetostrictive material inside of a stem in stainless steel, brass, PP, PVC or PVDF material.
- A float equipped with one or more magnets.



Principle of operation

The measurement process is activated by an electrical pulse sent by the control circuit inside the waveguide. This generates a magnetic field which is concentrated around the waveguide.
In measuring point the float, through the permanent magnet contained in it, generates a magnetic field orthogonal to the first.
In point of the waveguide, where they overlap the two magnetic fields, creates an elastic deformation caused by magnetostriction, is thus generated a mechanical wave that propagates in both directions at the speed of sound. The direct wave towards the electronic head is converted into an electrical signal, while the one directed towards the end of the waveguide is attenuated.
The propagation time of the wave from the measuring point to the electronic head is directly proportional to the distance between the float and the head.

TECHNICAL DATA

Concept	Magnetostrictive effect
Process connection	1" ÷ 2" DN25 ÷ DN125
Connection type	Threaded Flanged
PN	PN3 ÷ PN40
Max. temperature	150 °C
Output signal	0 – 10 V – 4 - 20 mA
Measuring length	To customers' requirement
Materials	Brass - Stainless steel - PVC - PVDF

CONSTRUCTION

- **IP67 Protection**
  M12x1, 8 poles plug