Standex Electronics

LIQUID LEVEL SENSOR OVERVIEW

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Introduction

Purpose

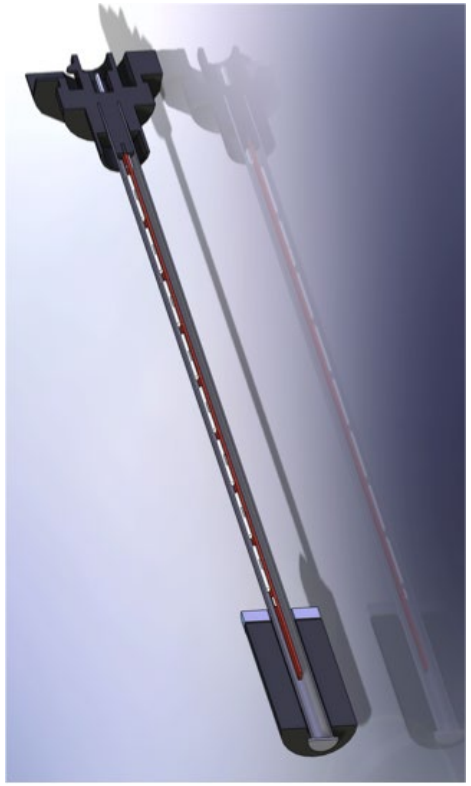
- Present the different types of liquid level sensors and explore their sensing applications

Objectives

- Present the liquid level sensing technology
- Define the key functions and key terms
- Present the various package configurations
- Present the varied applications

Introduction

- Level sensing approaches
- Inductive sensing
- Mechanical sensing
- Reed switch sensing



The Liquid Level Reed Sensor

- The sensors make-up
- Its basic function

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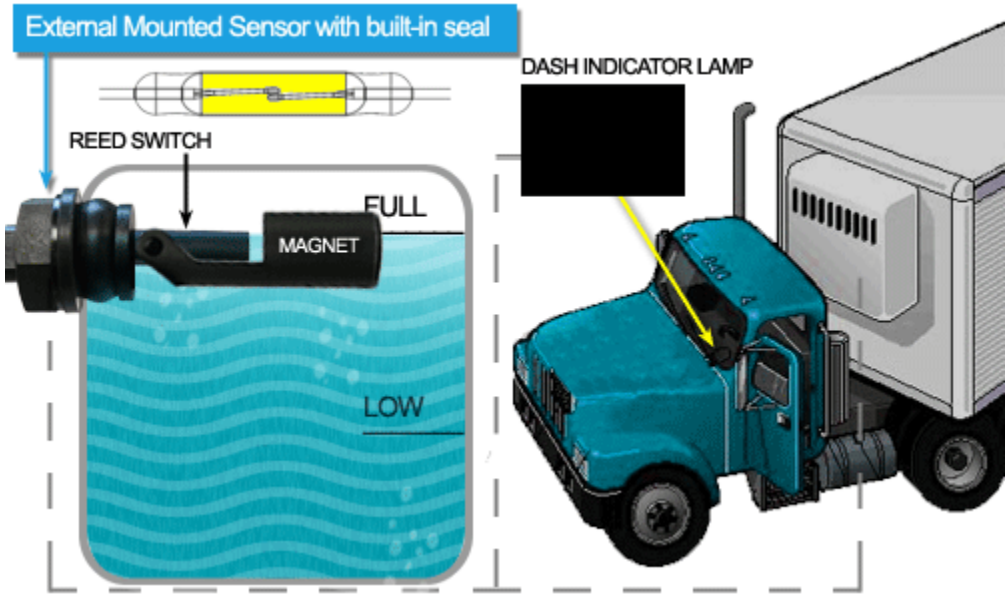


Key Sensor Points

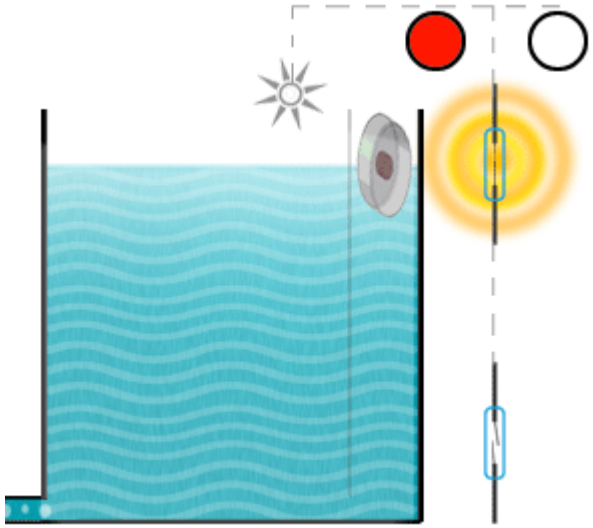
- Liquid Level Reed Sensors becoming the technology of the future
- Draws no power
- Ideal for battery applications

Key Sensor Points

- Hermetically sealed reed switch
- Packaged in rugged plastic and epoxy
- Also optionally packaged in stainless steel

Key Sensor Points

- Remote operation
- Contacts capable of switching millions of operations
- Magnet mounting



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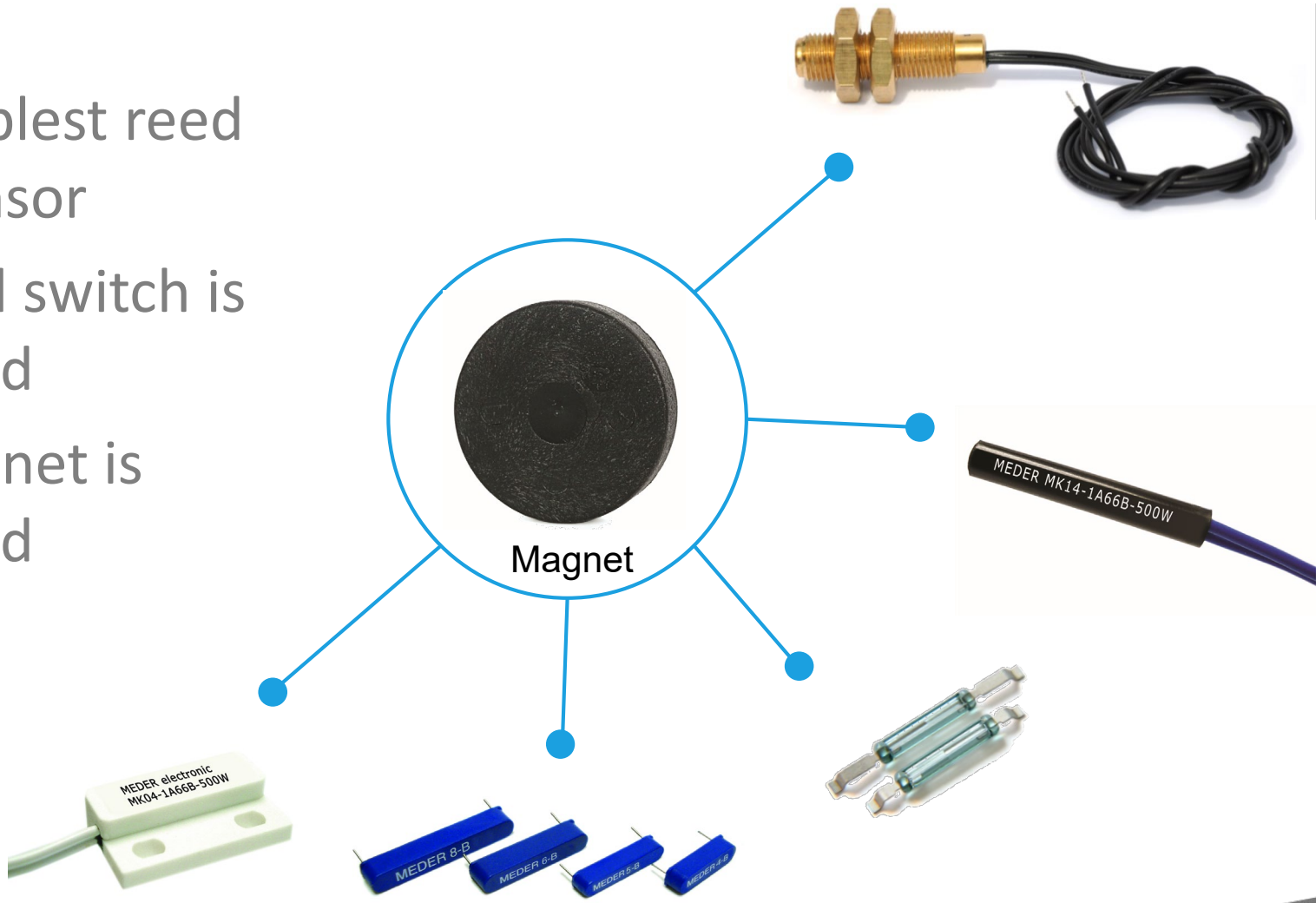
Key Aspects of the Sensor

The simplest reed level sensor

- A reed switch is needed
- A magnet is needed



Key Aspects of the Sensor

- The Stem
- The Float(s)
- Reed switch(es) housed in the stem

Switching Configurations

- Single pole normally open
- Single pole normally closed
- Single pole latching
- Single pole double throw
- Multi-pole single throw

Types of Plastic

- Polypropylene (PP) – water, mild acids
- Polyamide (PA) – oil, gas, brake fluid
- Nitrile Butadiene Rubber (NBR) – oil, gas, high temperatures

Liquid Level Reed Sensor Key Features

- Ability to perform under hot and cold liquid systems
- Meets RoHS Directive 2002/95/EC
- Hermetically sealed
- Dynamically tested contacts
- Reliable switching
- All inclusive fluid level sensor having the sensing element (reed switch), float, and magnet all as one component

Liquid Level Reed Sensor Key Features

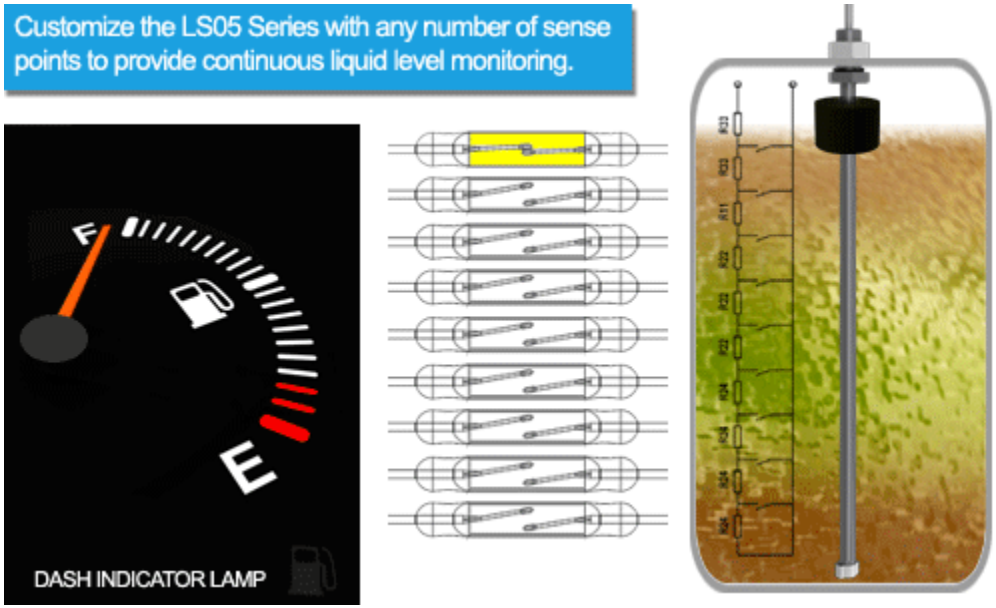
All inclusive fluid level sensor having the sensing element (reed switch), float, and magnet all as one component

- **LS04 Plastic Series (multi-level)**
  - Up to 9-point liquid level sensing
  - Up to 6 active floats on one stem or shaft
  - Stem length for 100 mm to 250 mm
- **LS05 Stainless Steel Series (multi-level)**
  - Any number of points liquid level sensing
  - Any number of floats on one stem or shaft
  - Stem length for 80 mm to 2,000 mm

Liquid Level Applications

A Look at a Multiple Sensing Point Application

- Multiple sensing points
- Stem circuitry



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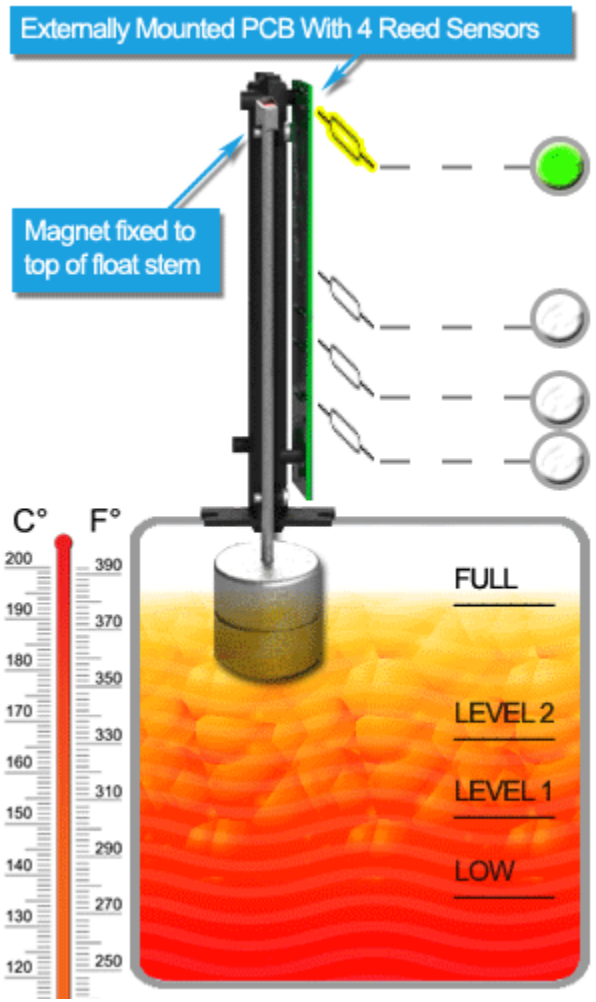
Laboratory Applications

- Laboratory fluid systems
- Four sensing positions
- Three are dedicated to monitoring hot fluid levels
- The fourth senses a low fluid level cutoff point.



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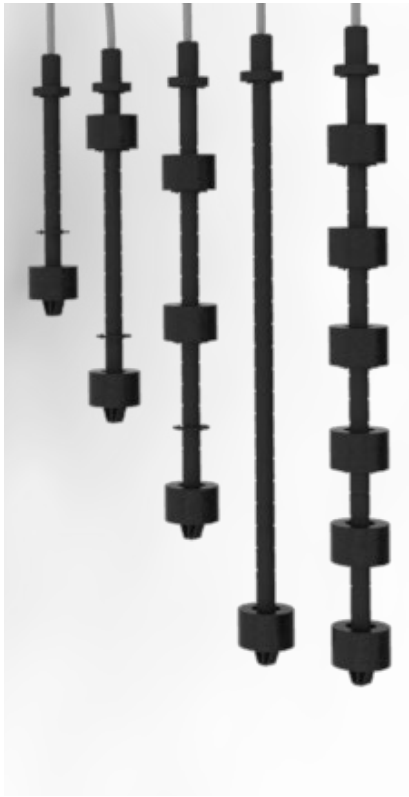
Wide Variety of Liquid Level Monitoring

- Liquid systems all have their own specialty aspects
- Different liquids have different densities
- Liquid environments range in temperature from -40°C for flour-inert (3-M liquids) to 200°C
- Pressure heated water and other special liquids



Automotive Applications

- Fuel sensor
- Engine oil
- ABS-system
- Radiator
- Window washer
- Power steering fluid
- Fuel filter for diesel
- Oil and fuel sensors for construction and agricultural vehicles

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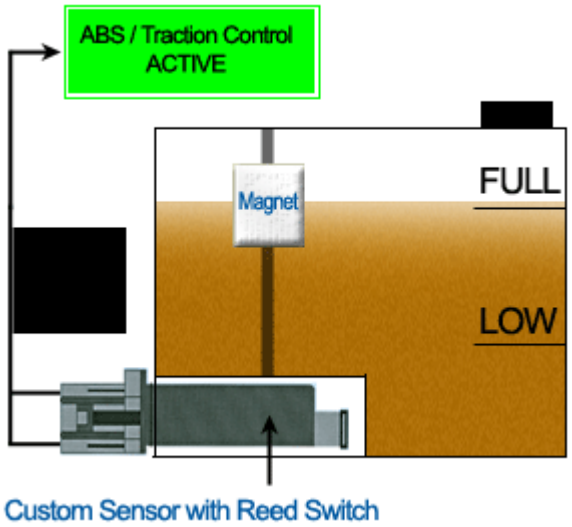
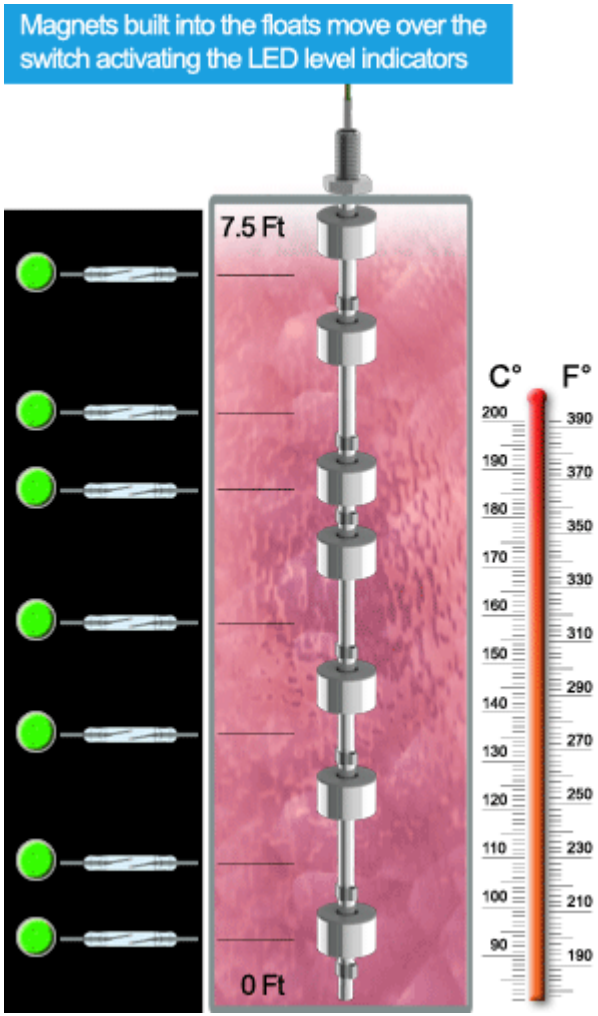


Aerospace and Marine Industry

- Fuel tank gauge
- Fuel sensor for rockets
- Fuel valves
- Sensor for liquid propane gas (LPG) ships
- Fuel sensor for Jet Ski
- Oil level sensor for Jet Ski
- Fuel gauge for tanker



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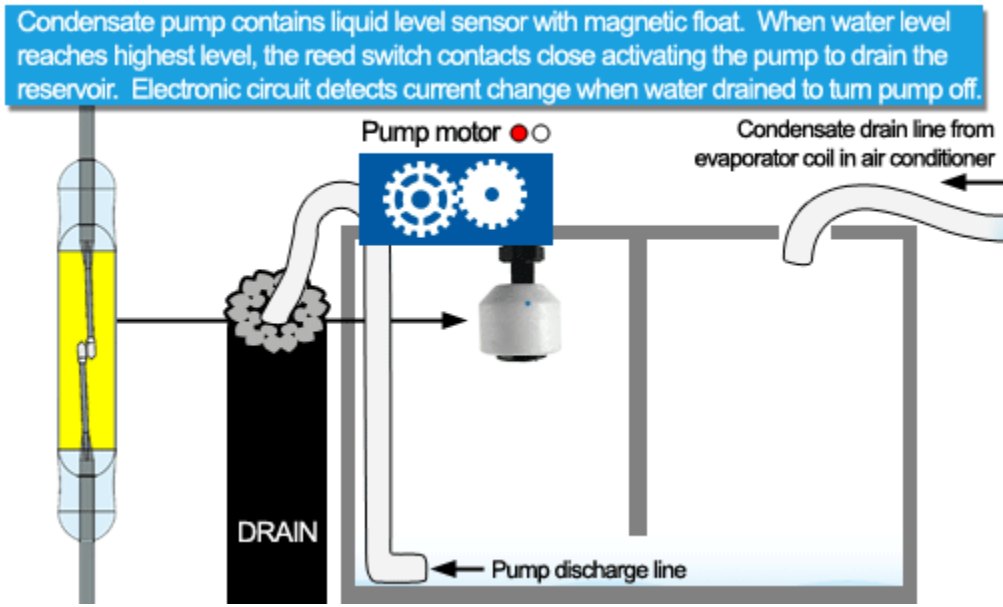
Industrial Requirements

- Liquid level sensor in factories
- Water seal float
- Oil level gauge for transformers
- Air-leak valve for underwater applications
- Boiler control
- Auto-drain for pneumatic filters
- Lubricating units
- Generators
- Gasoline pump fuel dispensers
- Gasoline underground tanks



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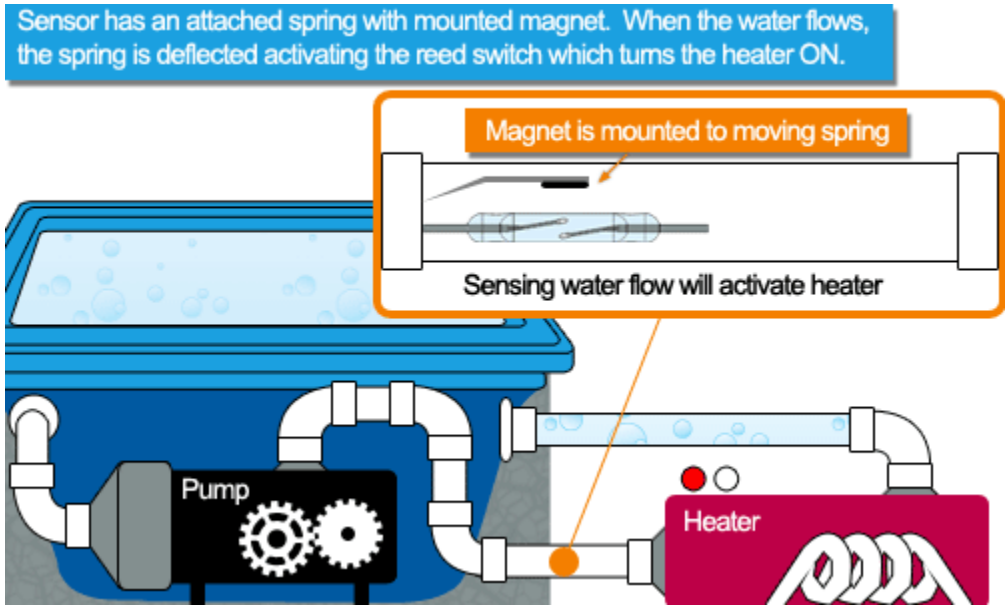
Various Electrical Equipment

- Humidifiers
- Copiers
- Automatic bending machines
- Water cleaners
- Detection of the liquid level for two different kinds of specific gravity liquids
- Water wash rug cleaners
- Developer for pictures
- Oil baths for testing instruments
- Atomic power plant liquid level applications



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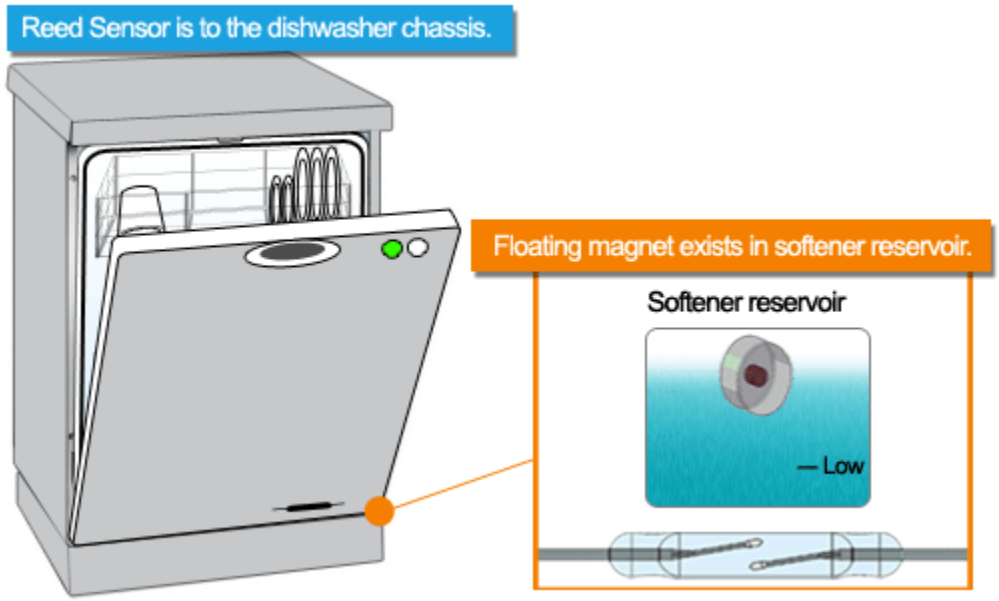
Home Appliances

- Stoves
- Air-conditioners
- Solar systems
- Fan-heaters
- Saunas
- Dish washers
- Showers and toilets that have electric water pumps
- Cleaning machines



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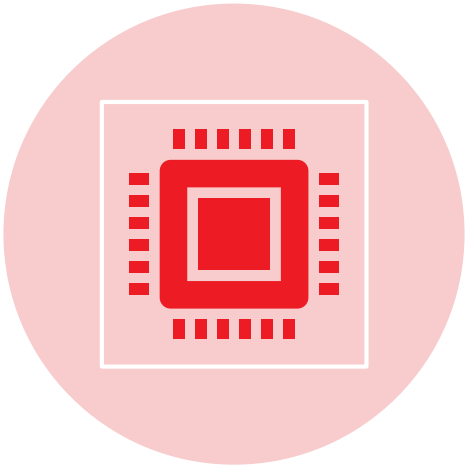
Summary

EACH TECHNOLOGY HAS ITS OWN BEST OPERATING CHARACTERISTICS



LIQUID LEVEL DETECTION CONTINUES TO INCREASINGLY SELECT THE LIQUID LEVEL REED SENSOR BECAUSE OF ITS FAVORABLE CHARACTERISTICS AND VERSATILE DESIGN CAPABILITIES OVER THE OTHER TECHNOLOGIES.

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