

# BFF3302 SENSOR AND INSTRUMENTATION SYSTEM

## Introduction to the sensor & instrumentation

By

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# Chapter Description

- **Aims**

- Obtain basic knowledge about electronic, measurement, sensors, and instrumentation
- Able to analyse particular sensor, instrument, and measurement situation.

- **Expected Outcomes**

- Determine general treatment of instrument elements and their characteristic
- Analyse transducer elements, intermediate elements, and data acquisition system (DAQ)
- Determine principles of the work and derive mathematical model of sensors for measuring motion and vibration, dimensional metrology, force, torque and power, pressure, temperature, flow and acoustics

- **References**

- Introduction to signal processing, instrumentation, and control : an integrative approach / Joseph Bentsman Hackensack, NJ : World Scientific Pub., 2016
- Transducers for instrumentation / M. G. Joshi, New Delhi, India : Infinity, 2017
- Instrumentation and measurement in electrical engineering / editor : Harinirina Randrianarisoa, New York : Arcler Press, 2017



# Problem

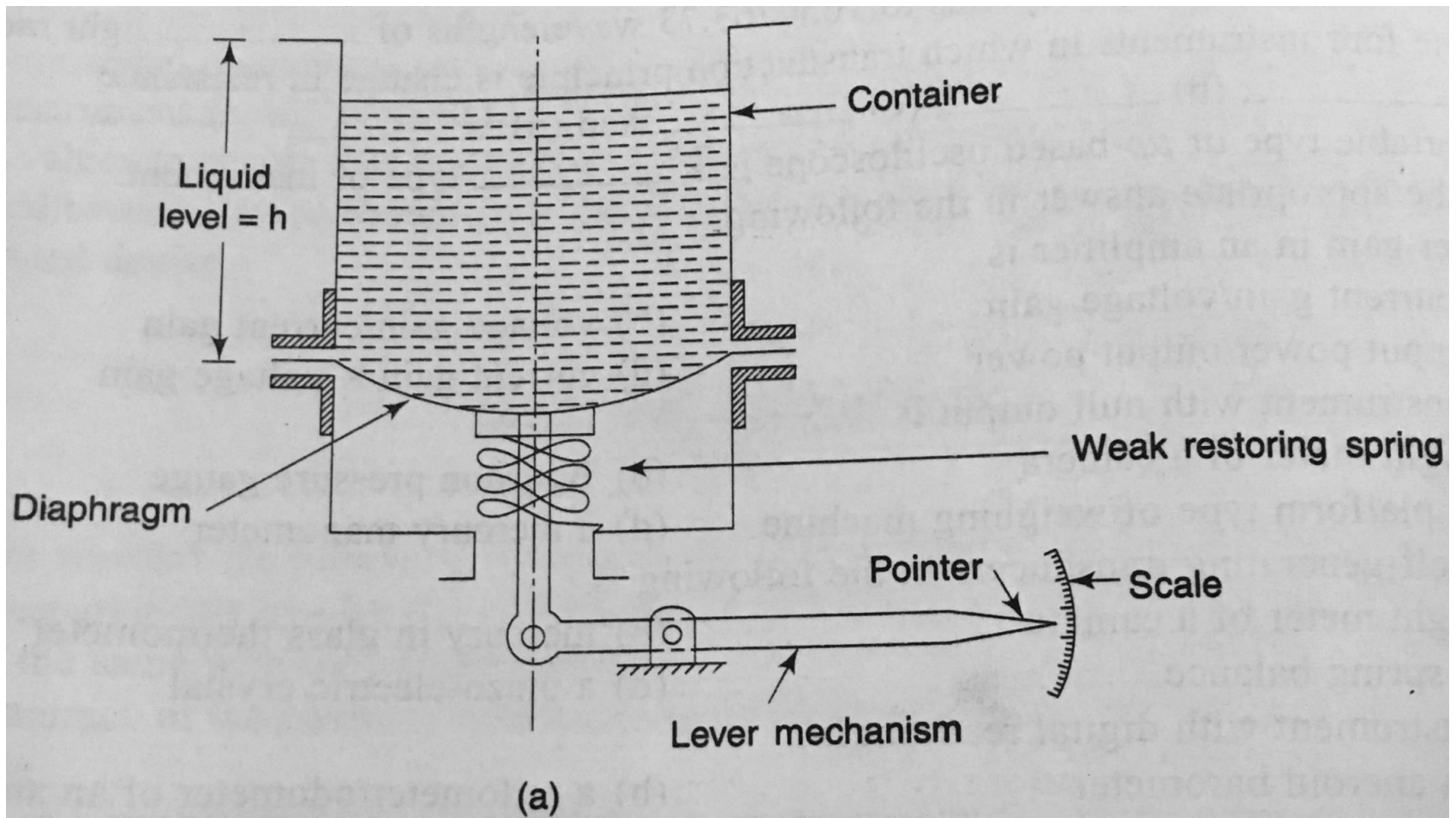
Schematic diagrams of the following measuring devices are given;

- a) Diaphragm type liquid level gauge
- b) Spring balance with electrical read out
- c) Float-operated fuel level gauge used in automobiles
- d) Mechanical type of displacement measuring dial gauge.

Indicate the basic and auxiliary functional elements of the device mentioned above in the form of block diagrams.

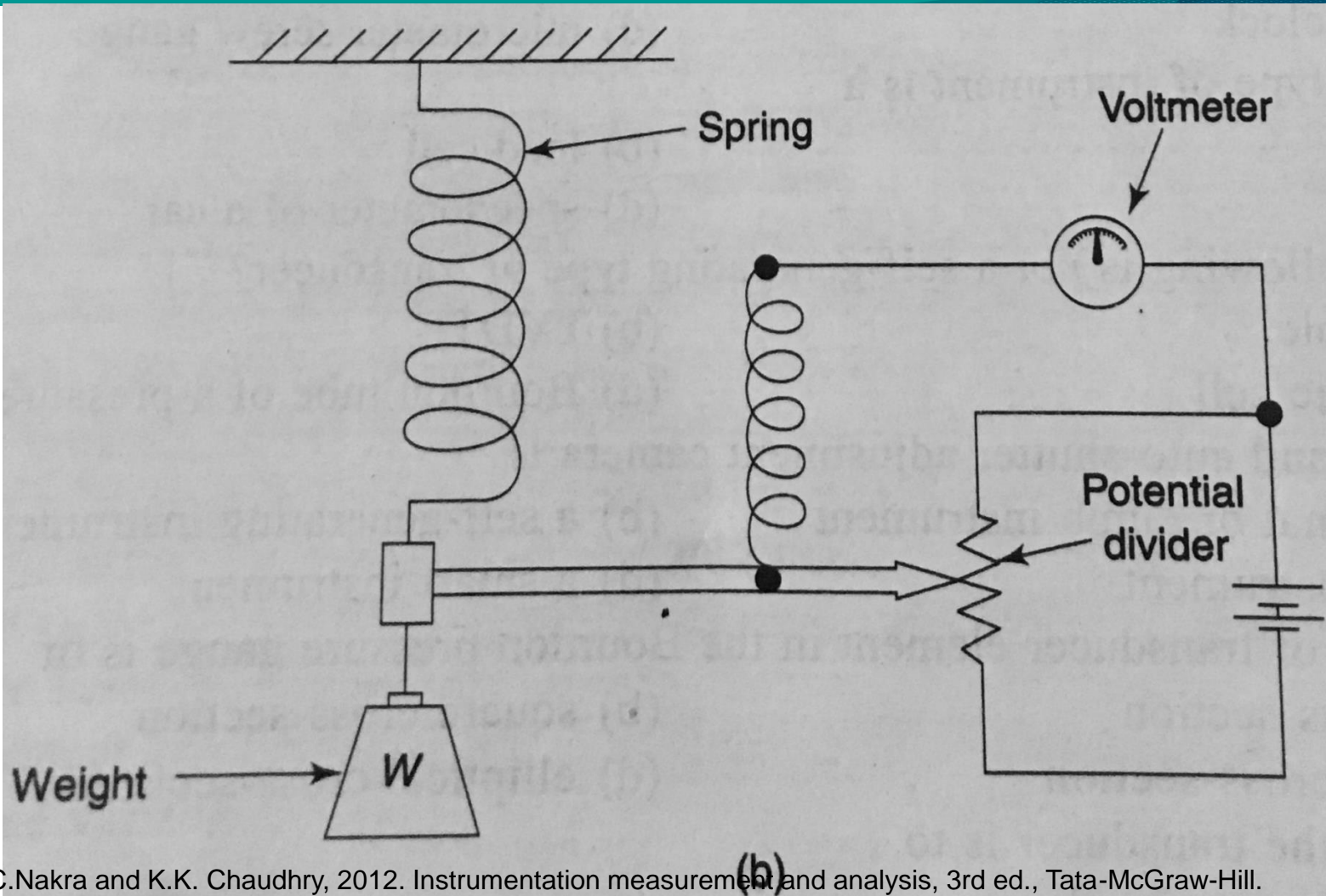
B.C.Nakra and K.K. Chaudhry, 2012. Instrumentation measurement and analysis, 3rd ed., Tata-McGraw-Hill.

# a. Diaphragm type liquid level gauge



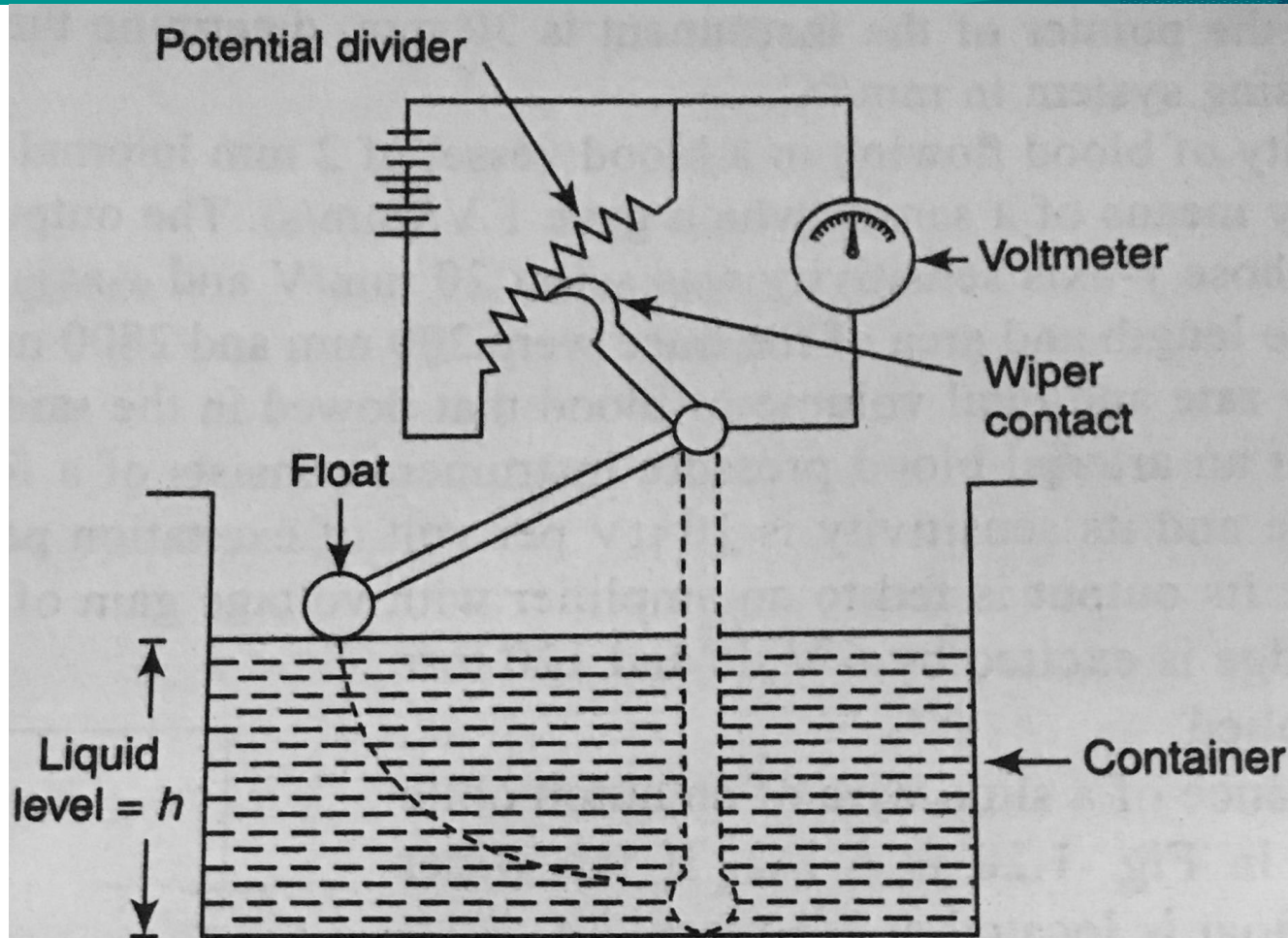
B.C.Nakra and K.K. Chaudhry, 2012. Instrumentation measurement and analysis, 3rd ed., Tata-McGraw-Hill.

## b. Spring balance with electrical read out



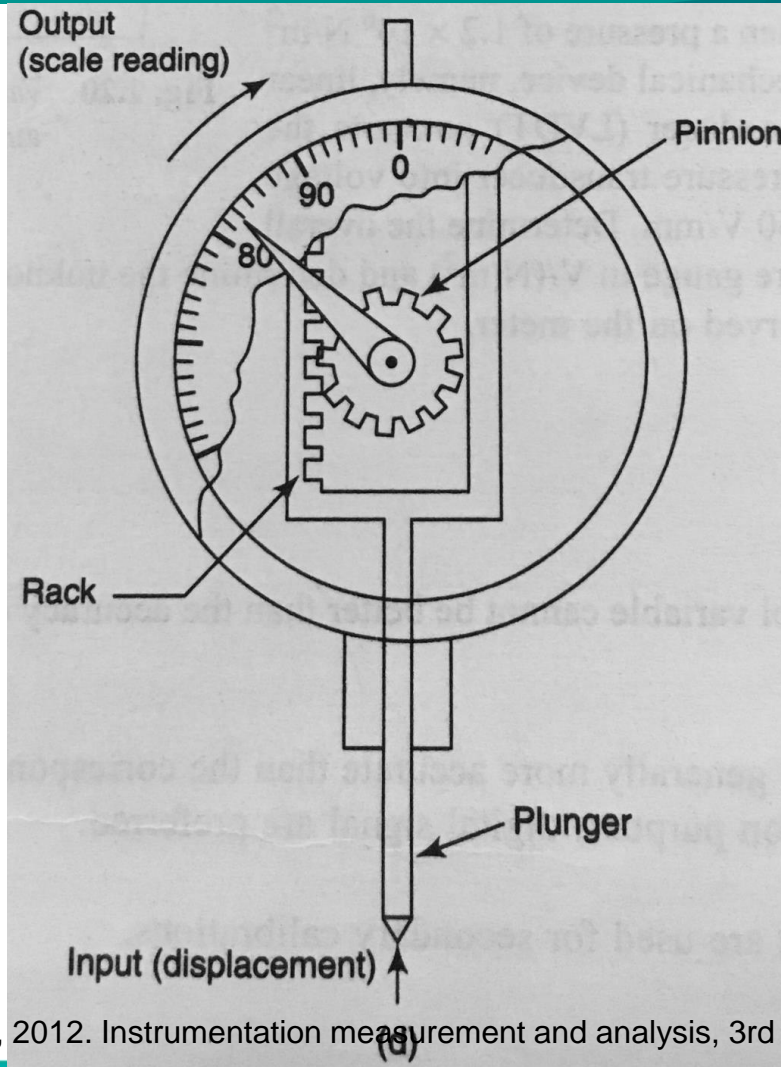
B.C.Nakra and K.K. Chaudhry, 2012. Instrumentation measurement and analysis, 3rd ed., Tata-McGraw-Hill.

# c. Float-operated fuel level gauge used in automobiles



B.C.Nakra and K.K. Chaudhry, 2012. Instrumentation measurement and analysis, 3rd ed., Tata-McGraw-Hill.

## d. Mechanical type of displacement measuring dial gauge.



B.C.Nakra and K.K. Chaudhry, 2012. Instrumentation measurement and analysis, 3rd ed., Tata-McGraw-Hill.