

# ANALOG MULTIMETER




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A multimeter is device that can be used to measure multiple quantities.

when a single device is used to measure multiple quantities, the device is called multimeter.

Based on output representation, there are two types of multimeters

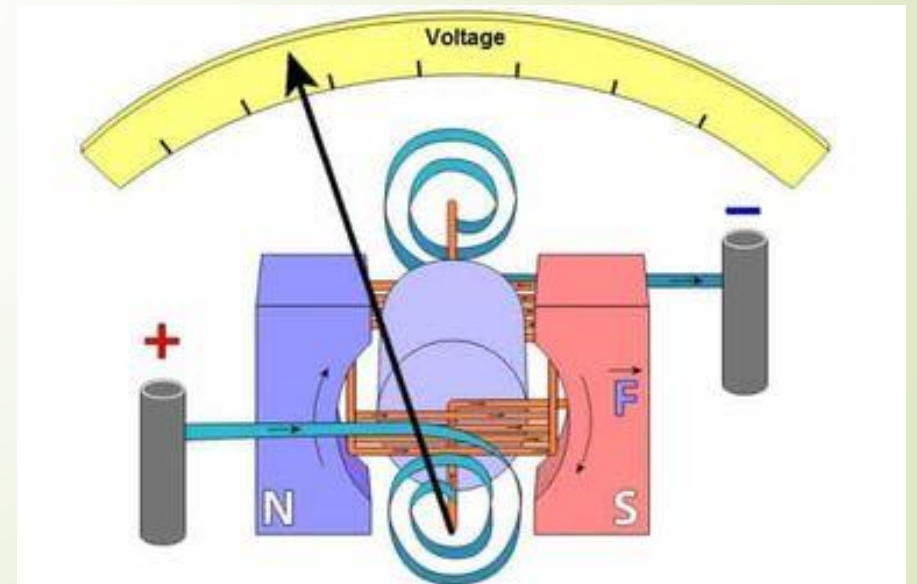
- Analog multimeter
- Digital multimeter

## Analog Multimeter:

- An analog Multimeter is a Permanent Magnet Moving Coil (PMMC) meter type measuring instrument.
- It works on the principle of d'Arsonval galvanometer.
- The analog multimeter has an analog display that uses the deflection of a pointer on the scale to indicate the level of measurement being made.
- The pointer deflects from its initial position increasingly as the measuring quantity increases.

## Working of Analog Multimeter

The analog multimeter is a PMMC type instrument. when a current is passed through its coil, the coil moves in a magnetic field produced by the permanent magnet. A pointer is attached with the coil. When current flows in the coil, a deflecting torque acts on the coil that will rotate it by an angle, the pointer moves over a scale. A pair of hairsprings is attached to the spindle to provide the controlling torque.



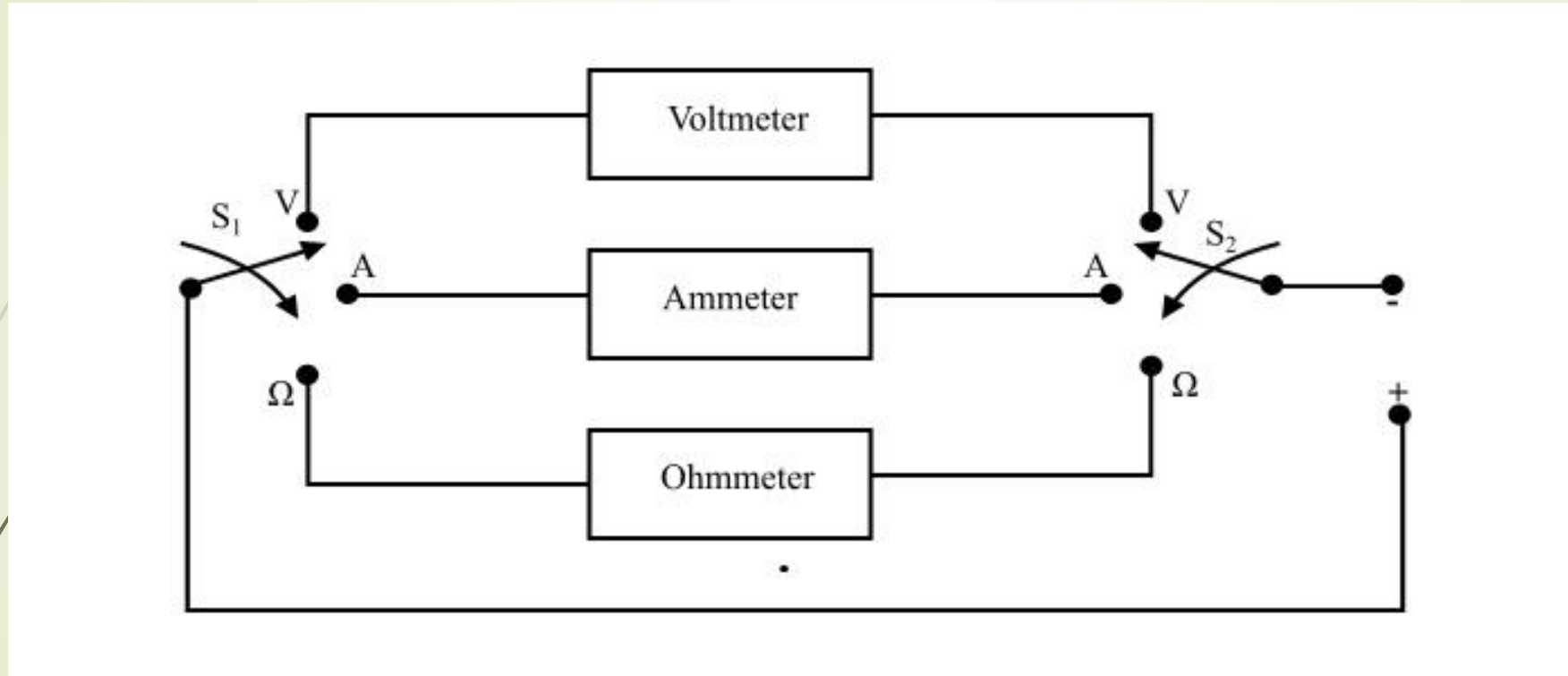


## Analog Multimeter can measure

- DC Voltage - Voltmeter
- AC Voltage- Voltmeter
- DC Current- Ammeter
- Resistance- Ohmmeter



## Block diagram of Analog Multimeter



Here, two switches  $S_1$  and  $S_2$  are used to select the desired meter. It also has a rotary range-selector switch to choose a particular range of current, voltage and resistance.

ows a typical front panel control

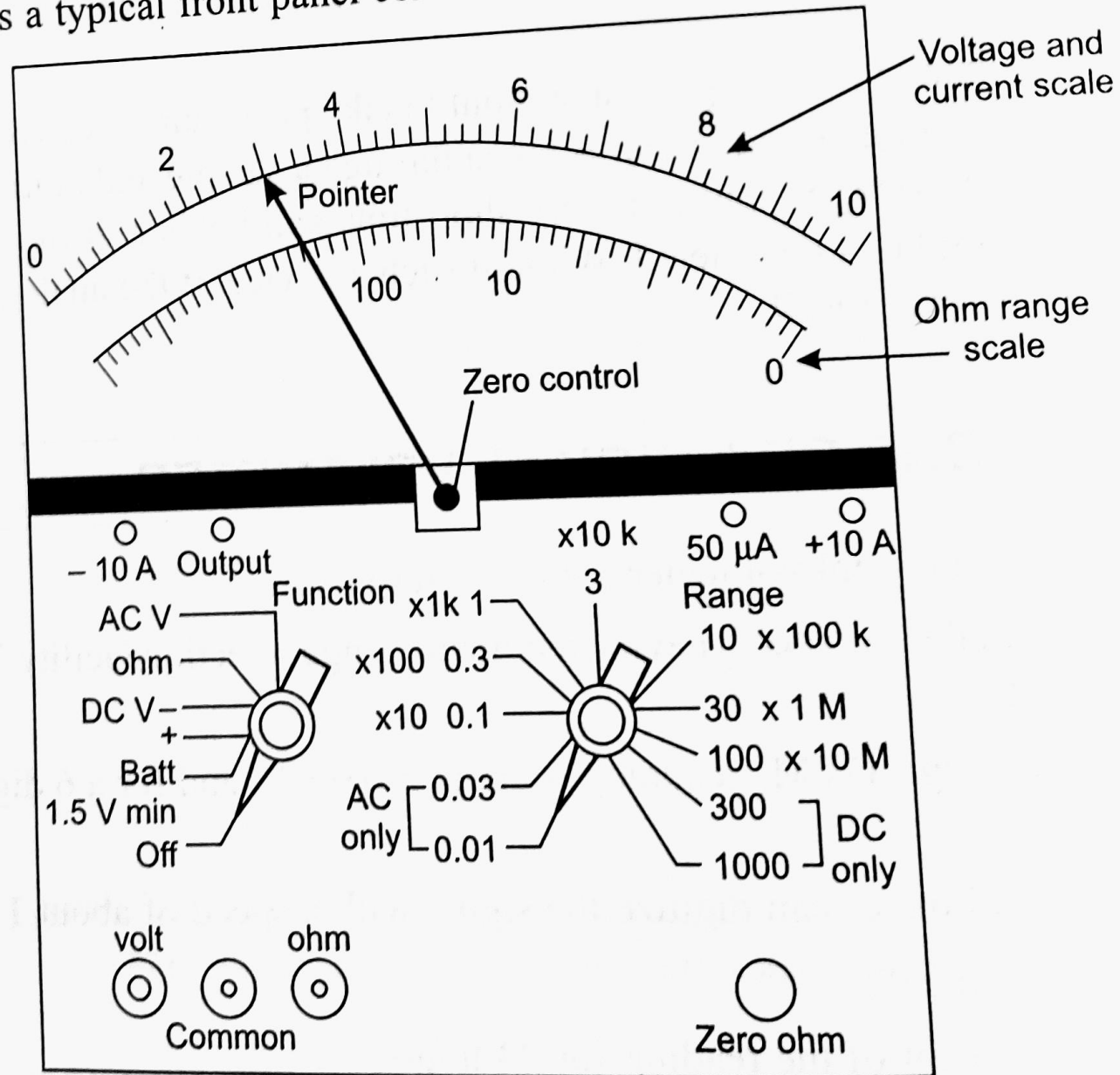


Fig. (40) Front panel controls of a typical multimeter

# Measurement

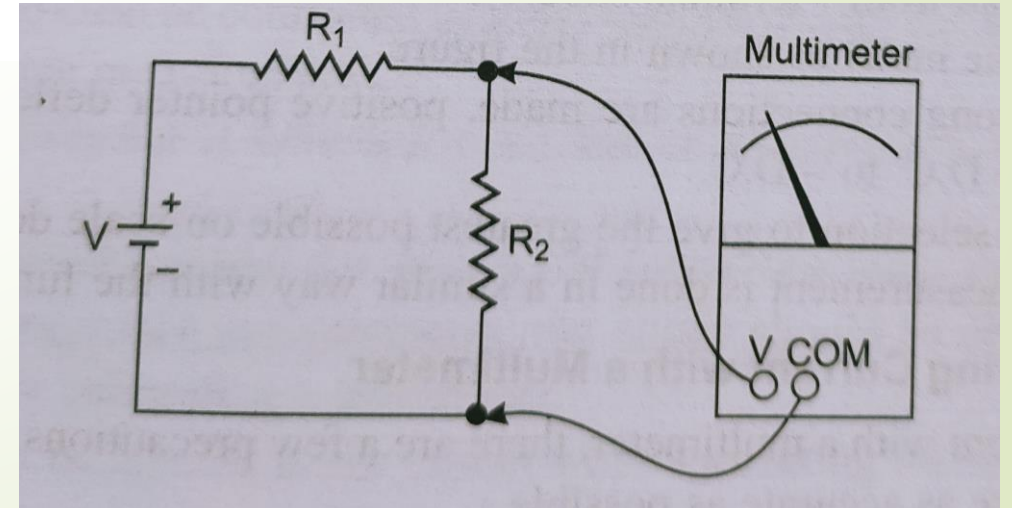
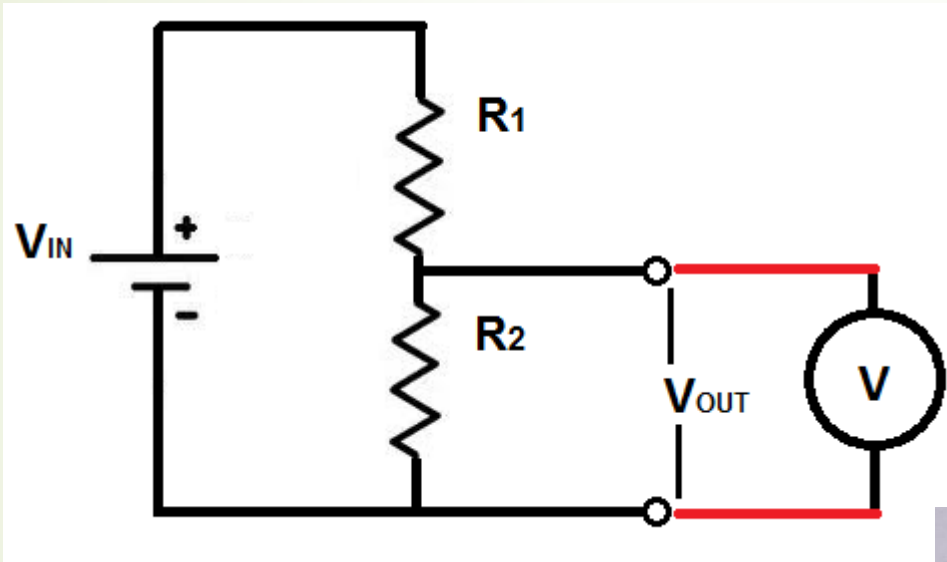


## **Steps for the use of Analog Multimeter –**

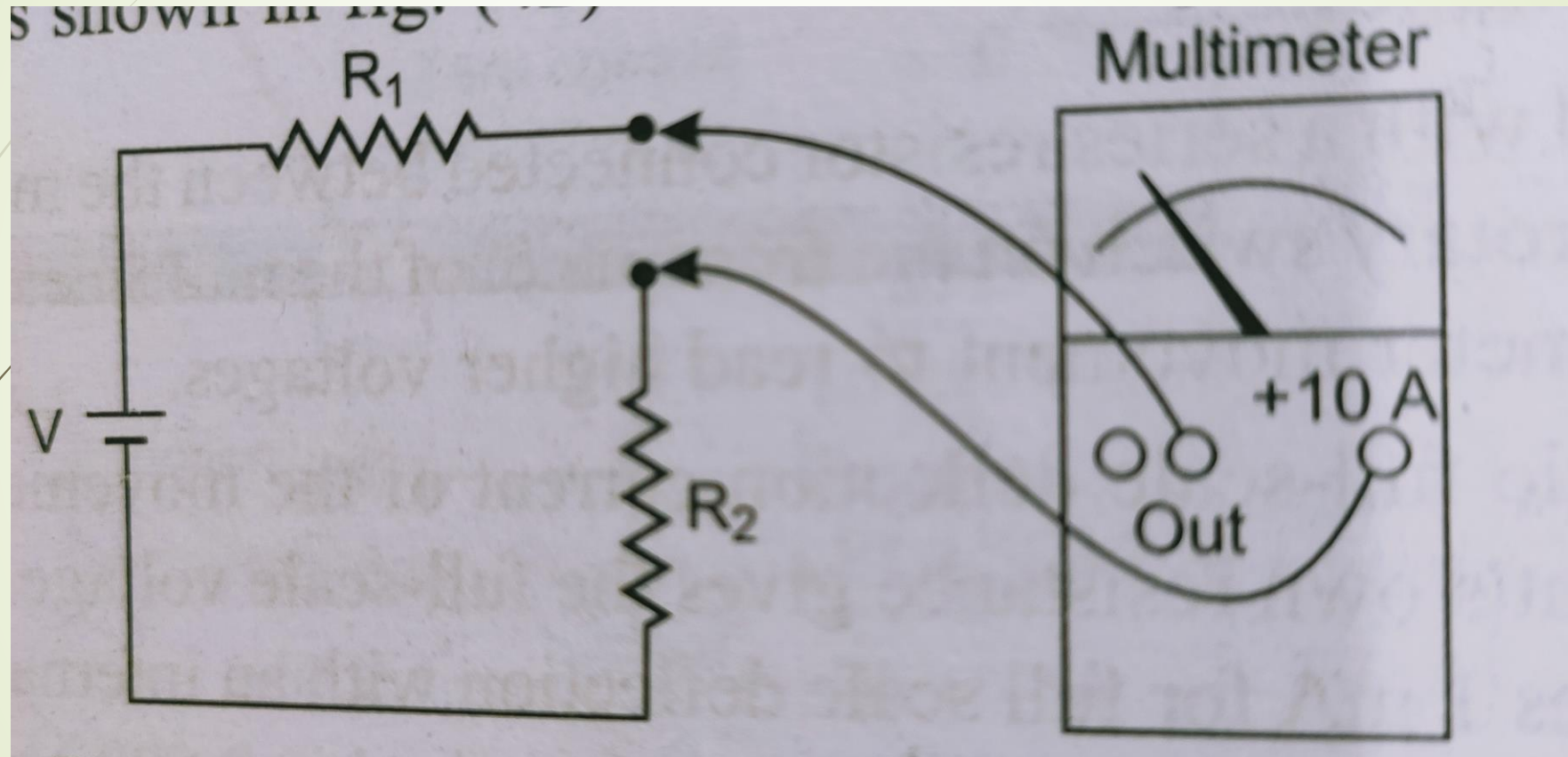
- Insert the probes into the correct connections.
- Set switch to the correct measurement types and range for the measurement to be made.
- While selecting the range, ensure that the maximum range is above than that is expected.
- The range of multimeter is then optimized for the best reading.



# Measurement of Voltage



## Measurement of Current







## Advantages of Analog Multimeter

- It gives the continuous reading, thus a sudden change in signal can be detected which is not possible with digital multimeter.
- Analog multimeters are very cheap.
- All measurements can be made using a single meter only.





## Disadvantages of Analog Multimeter

- They are bulky and larger sized.
- Multiple scales, these can cause confusion.
- Low input resistance.
- Analog multimeters do not have auto-polarity function. Therefore, it is necessary to connect probes correctly.
- Less accurate than a digital multimeter.

Any Questions  
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