4.3 Differential Amplifier

A device which accepts an input signal and produces an output signal proportional to the input, is called an amplifier. An amplifier which amplifies the difference between the two input signals is called differential amplifier. The differential amplifier configuration is used in variety of analog circuits. The. differential amplifier is an essential and basic building block in modern IC amplifier .The Integrated Circuit (IC) technology is well known now a days, due to which the design of complex circuits become very simple. The IC version of operational amplifier is inexpensive, takes upless space and consumes less power. The. Differential amplifier is the basic building block of such IC operational amplifier.

Basics of Differential Amplifier

The Differential Amplifier amplifies the difference between two input voltage signals. Hence it is also called as difference amplifier.

Consider an ideal differential amplifier shown in the Fig. A

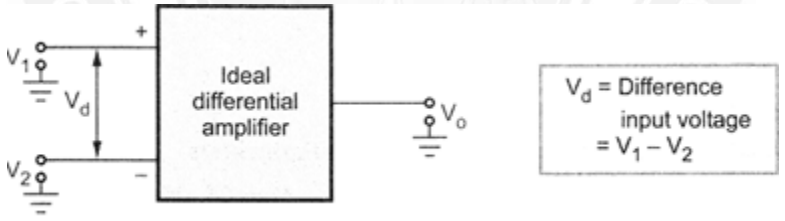

Figure: 4.3.1 Differential Amplifier

[Source: "Electronic devices and circuits" by "Balbir Kumar, Shail.B.Jain, and Page: 144]

V1 and V2 are the two input signals while Vo is the output. Each signal is measured with respect to the ground.

In an ideal differential amplifier, the output voltage VType equation here.o is proportional to the difference between the two input signals.

$$V_0 \propto V_1 - V_2$$

$$Differential\ gain\ A_d$$