

**Object :**

**To study the Op-amp as Current to Voltage Converter.**

**Apparatus Required :**

1. Analog board **AB-30**.
2. DC power supply +12V, -12V and variable dc supply of 0-5V from external source or **ST-2612 Analog Lab**.
3. Ammeter.
4. Voltmeter / Oscilloscope.
5. Function Generator.
6. 2mm patch chords.

**Circuit Diagram :**

Circuit used to study the operation of I-V Converter is shown below :

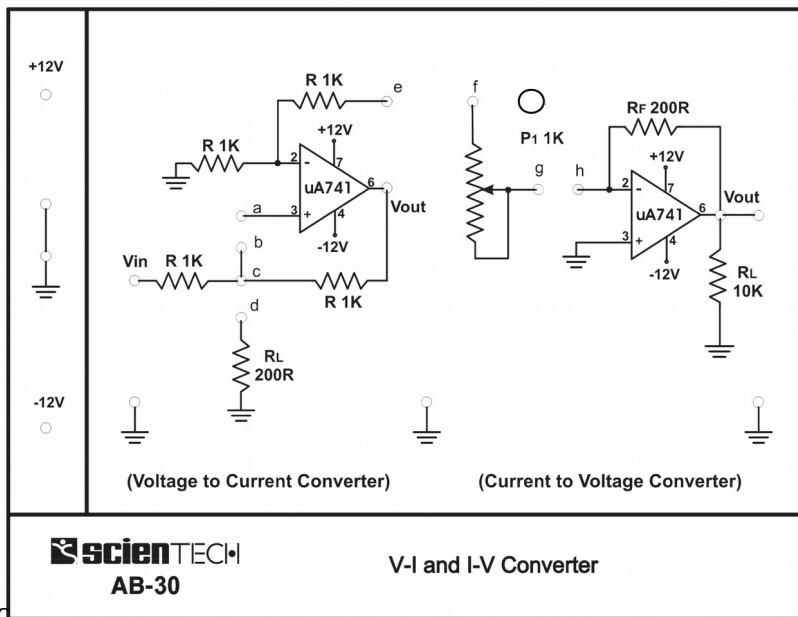


Fig. 4

**Procedure :**

- Connect +12V and -12V dc power supplies at their indicated position from external source or **ST-2612 Analog Lab**.
  - Connect 5V dc signal at the input (between points f and gnd) of Voltage to Current converter circuit of **AB-30** board.
1. Connect ammeter between points g and h (this will display the current flowing through the op-amp,  $I_{in}$  ).
  2. Connect Voltmeter between sockets  $V_{out}$  and gnd.
  3. Vary the pot to vary the input current from 1mA, gradually upto 5mA (1mA, 2mA, 3mA, 4mA and 5mA) and note the respective voltage on voltmeter in the following table. This is the practical value of voltage.
  4. Also calculate theoretical value of output voltage form Eq.3 to crosscheck your results.

<b>I/p DC Current (<math>I_{in}</math>)</b>	<b>O/p DC Voltage (Practical value) (<math>V_{out}</math>)</b>	<b>O/p DC Voltage from Eq.1 (<math>V_{out}</math>) (Theoretical Value)</b>
5mA		
10mA		
15mA		
20mA		
24mA		

5. Remove dc signal applied at input and connect a 200Hz sine wave signal between points f and gnd) of Current to Voltage converter circuit of **AB-30** board. Set the voltage to 3Vp-p .
6. Vary the pot to vary the input current from 1mA, gradually upto 15mA (1mA, 3mA, 5mA..... 15mA) and note the respective voltage on voltmeter in the following table. This is the practical value of voltage.

7. Also calculate theoretical value of output voltage from Eq.3 to crosscheck your results.

I/p AC Current ( $I_{in}$ )	O/p AC Voltage (V) (Practical value) ( $V_{out}$ )	O/p AC Voltage (V) from Eq.1 ( $V_{out}$ ) (Theoretical Value)
1mA		
3mA		
5mA		
7mA		
9mA		
11mA		
13mA		
15mA		