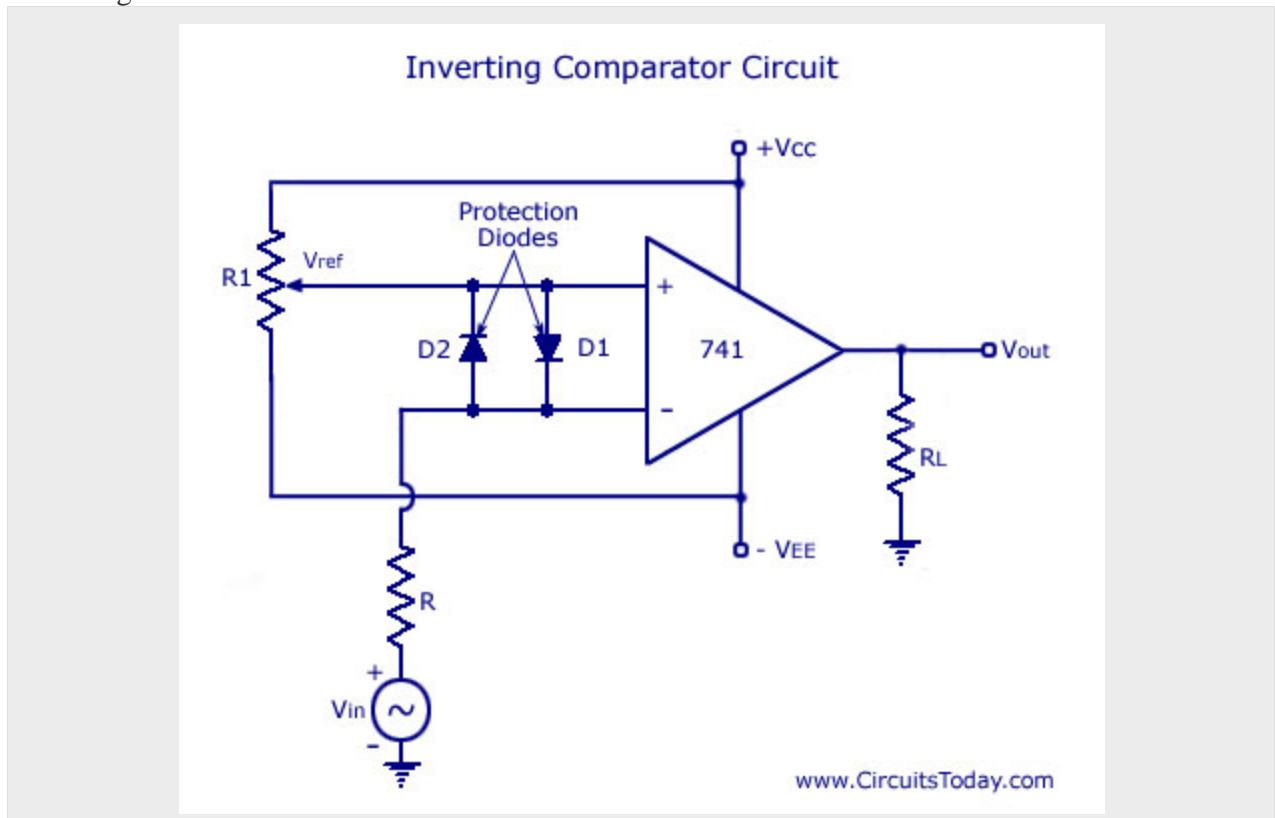


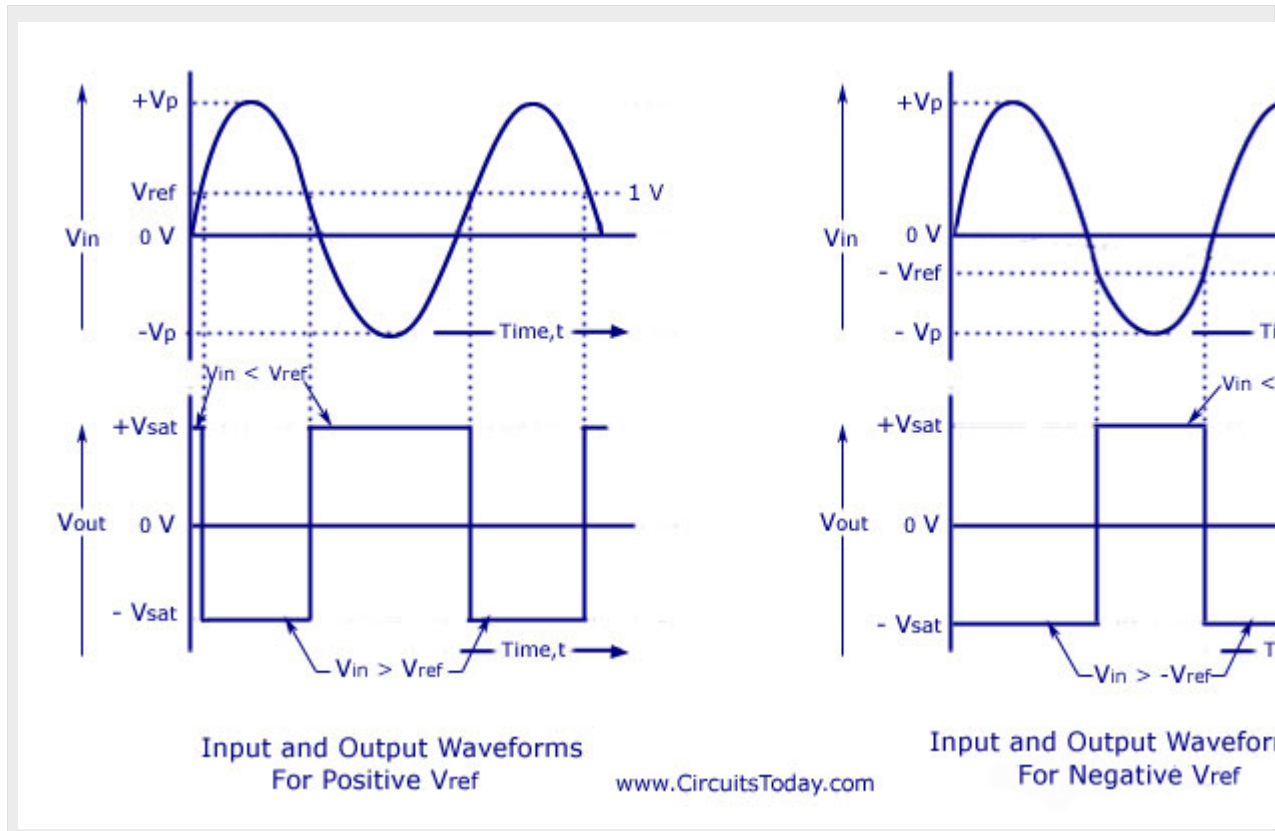
OP-AMP COMPARATOR - II

Inverting 741 IC Op-amp Comparator Circuit

An inverting 741 IC op-amp comparator circuit is shown in the figure below. It is called an inverting comparator circuit as the sinusoidal input signal V_{in} is applied to the inverting terminal. The fixed reference voltage V_{ref} is given to the non-inverting terminal (+) of the op-amp. A potentiometer is used as a voltage divider circuit to obtain the reference voltage in the non-inverting input terminal. Both ends of the POT are connected to the dc supply voltage $+V_{CC}$ and $-V_{EE}$. The wiper is connected to the non-inverting input terminal. When the wiper is rotated to a value near $+V_{CC}$, V_{ref} becomes more positive, and when the wiper is rotated towards $-V_{EE}$, the value of V_{ref} becomes more negative. The waveforms are shown below.



Op-amp 741 IC Inverting Comparator Circuit



741 IC Op-Amp Inverting Comparator Waveform

Comparator Characteristics

1. **Operation Speed** – According to change of conditions in the input, a comparator circuit switches at a good speed between the saturation levels and the response is instantaneous.
2. **Accuracy** – Accuracy of the comparator circuit causes the following characteristics:-
 - (a) **High Voltage Gain** – The comparator circuit is said to have a high voltage gain characteristic that results in the requirement of smaller hysteresis voltage. As a result the comparator output voltage switches between the upper and lower saturation levels.
 - (b) **High Common Mode Rejection Ratio (CMRR)** – The common mode input voltage parameters such a noise is rejected with the help of a high CMRR.
 - (c) **Very Small Input Offset Current and Input Offset Voltage** – A negligible amount of Input Offset Current and Input Offset Voltage causes a lesser amount of offset problems. To reduce further offset problems, offset voltage compensating networks and offset minimizing resistors can be used.

Source : <http://www.circuitstoday.com/op-amp-comparator>