

## TYPES OF POWER CONVERTERS - I

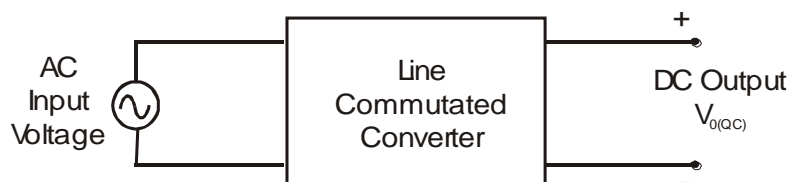
For the control of electric power supplied to the load or the equipment/machinery or for power conditioning the conversion of electric power from one form to other is necessary and the switching characteristic of power semiconductor devices (Thyristors) facilitate these conversions.

The thyristorised power converters are referred to as the static power converters and they perform the function of power conversion by converting the available input power supply in to output power of desired form.

The different types of thyristor power converters are

- Diode rectifiers (uncontrolled rectifiers).
- Line commutated converters or AC to DC converters (controlled rectifiers)
- AC voltage (RMS voltage) controllers (AC to AC converters).
- Cyclo converters (AC to AC converters at low output frequency).
- DC choppers (DC to DC converters).
- Inverters (DC to AC converters).

### 1. AC TO DC Converters (Rectifiers)



These are AC to DC converters. The line commutated converters are AC to DC power converters. These are also referred to as controlled rectifiers. The line commutated converters (controlled rectifiers) are used to convert a fixed voltage, fixed frequency AC power supply to obtain a variable DC output voltage. They use natural or AC line commutation of the Thyristors.

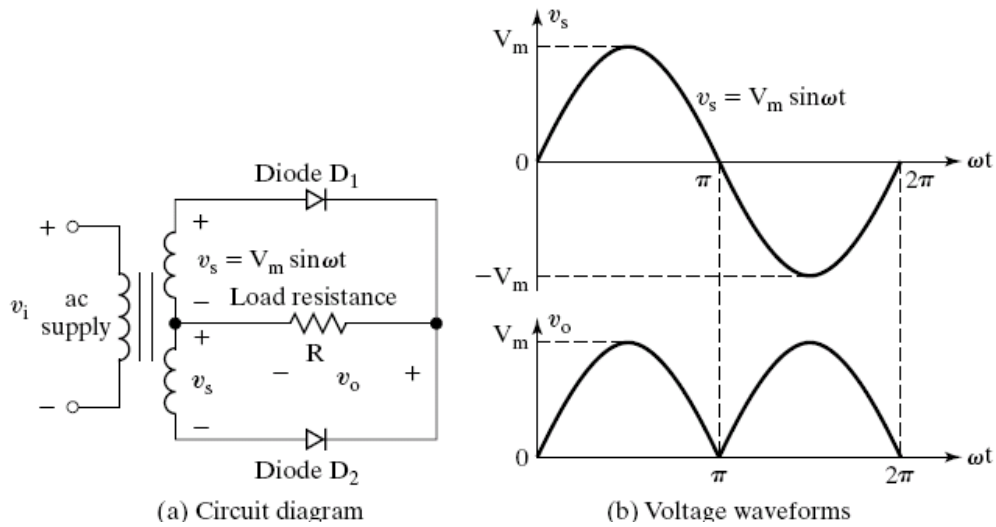


Fig1.4: A Single Phase Full Wave Uncontrolled Rectifier Circuit (Diode Full Wave Rectifier) using a Center Tapped Transformer

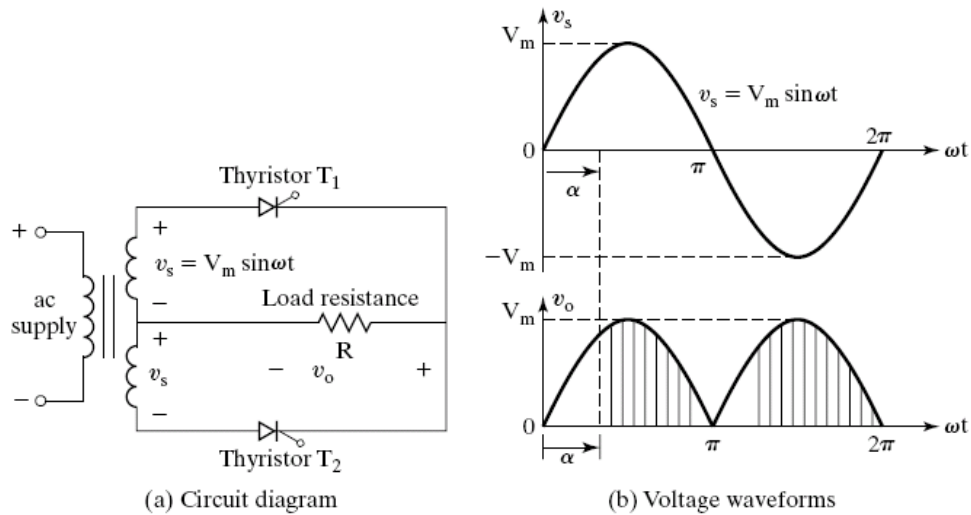


Fig: 1.5 A Single Phase Full Wave Controlled Rectifier Circuit (using SCRs) using a Center Tapped Transformer

Different types of line commutated AC to DC converters circuits are

- Diode rectifiers – Uncontrolled Rectifiers
- Controlled rectifiers using SCR's.
  - Single phase controlled rectifier.
  - Three phase controlled rectifiers.

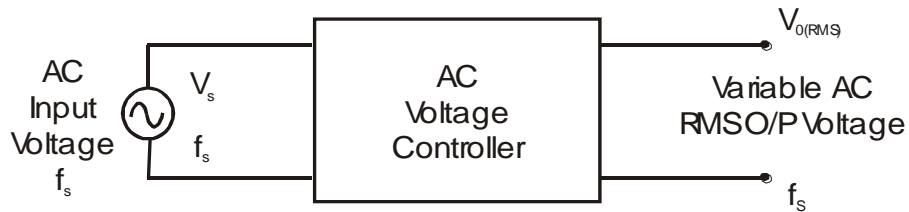
### Applications of Ac To Dc Converters

AC to DC power converters are widely used in

- Speed control of DC motor in DC drives.

- UPS.
- HVDC transmission.
- Battery Chargers.

## 2. a. AC TO AC Converters or AC regulators.



The AC voltage controllers convert the constant frequency, fixed voltage AC supply into variable AC voltage at the same frequency using line commutation.

AC regulators (RMS voltage controllers) are mainly used for

- Speed control of AC motor.
- Speed control of fans (domestic and industrial fans).
- AC pumps.

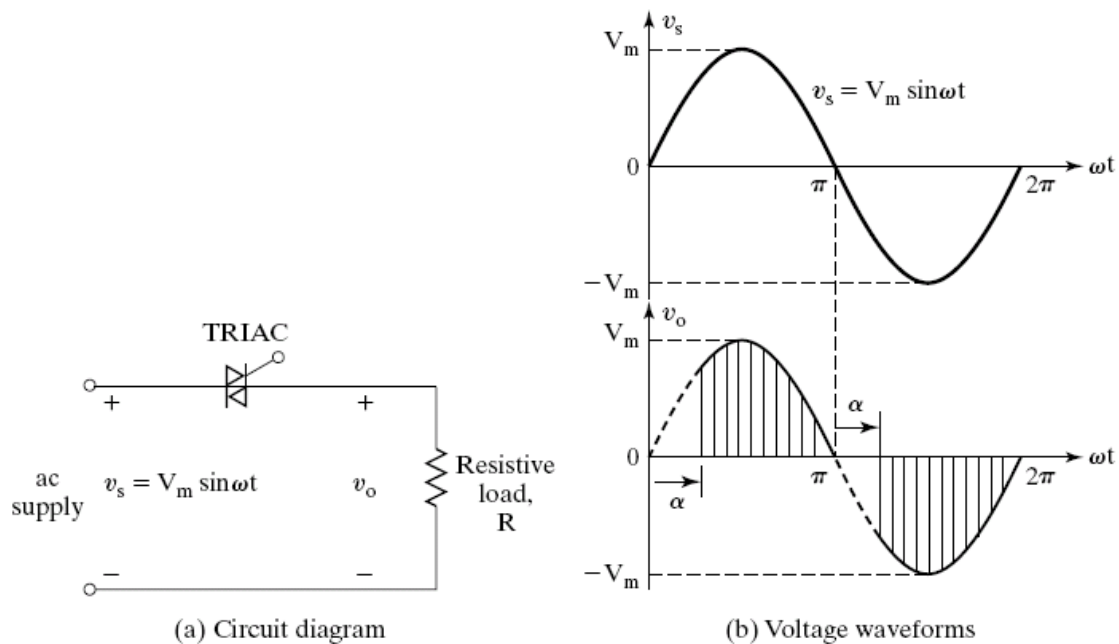


Fig.1.6: A Single Phase AC voltage Controller Circuit (AC-AC Converter using a TRIAC)