4.1 Static relays

4.1.1 Static relays or solid state relays

- Static relay is an electrical relay in which the response (or) action is developed by electrical/magnetic/optical or other without mechanical motion of components.
- A static relay is defined as one in which there is no armature or other moving element, the desired response being developed by electronics solid state, magnetic components without mechanical motion.
- A relay designed to get a response not from a mechanical operation but from an electrical, electromagnetic, or optical motion.

4.1.2 Components of static relays:

- The output of a CT or PT of a transducer is rectified by the rectifier.
- The rectified output is given to a measuring unit constitute of comparators, level detectors, and logic circuits. The output is actuated when the dynamic input, i.e. the relaying quantity attains the threshold value.
- The output of the measuring unit is fed to the output unit devices after it is amplified by the amplifiers. The output unit activates the trip coil only when the relay operates. The relaying quantity such as the voltage and current is rectified and measured

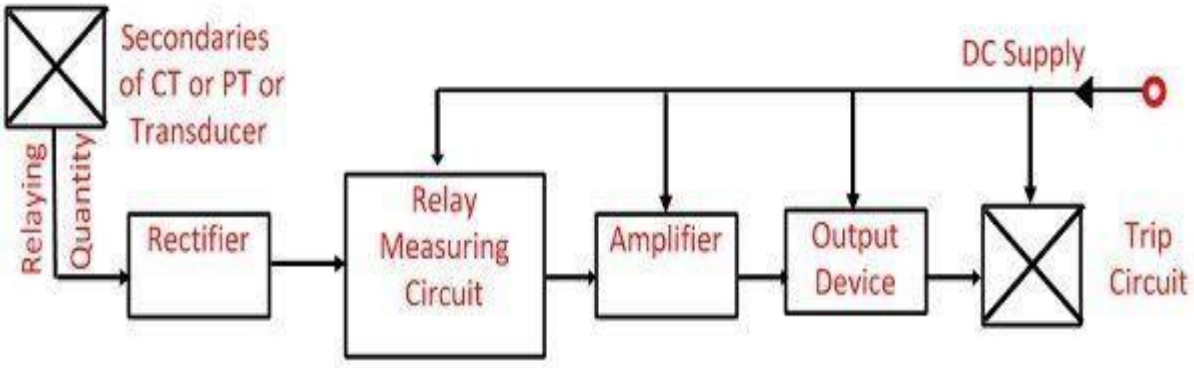

Figure 4.1 Block diagram of static relay

[Source: "Power System Protection and Switchgear" by B.Rabindranath and N.Chander, Page: 386]

4.1.3 Working of a static relay

- The output of CTs/PTs/Transducers is rectified in rectifier
- The rectified output is fed into the relay measuring unit.
- The output of measuring unit is then amplified in amplifier
- The amplified output is given to the output device, which energizes the trip-coil, when the relay operates

4.1.4 Merits of static relays

- Reliability
- Sensitivity
- Speed
- Selectivity
- Versality

4.1.5 Limitations of static relays

- Auxiliary voltage requirement for relay operation
- Static relays are sensitive to voltage transients which are caused by operation of breaker and isolator in the primary circuit of CTs and PTs.
- Non availability of test data
- Highly reliable power supply circuits are required