



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)



UNIT-IV- Web based power quality monitoring



Web based Power quality monitoring



Power quality monitoring has increasing role in deregulated electricity supply market. Various utilities all over the world are collecting power quality data to provide a power quality database as a source of benchmark. In deregulated electricity market utilities will be required to provide reliability and power quality indices. Industrial and commercial customers are increasingly getting affected by poor power quality problems. A real time power quality monitoring will help to take some corrective actions. A web based, near real time power quality monitoring system is necessary to provide such information, both locally and on Nation wide basis to customer.



Power Quality Conditioners





Functions of Power Quality conditioner





Types of power quality conditioners





Types of power quality conditioners





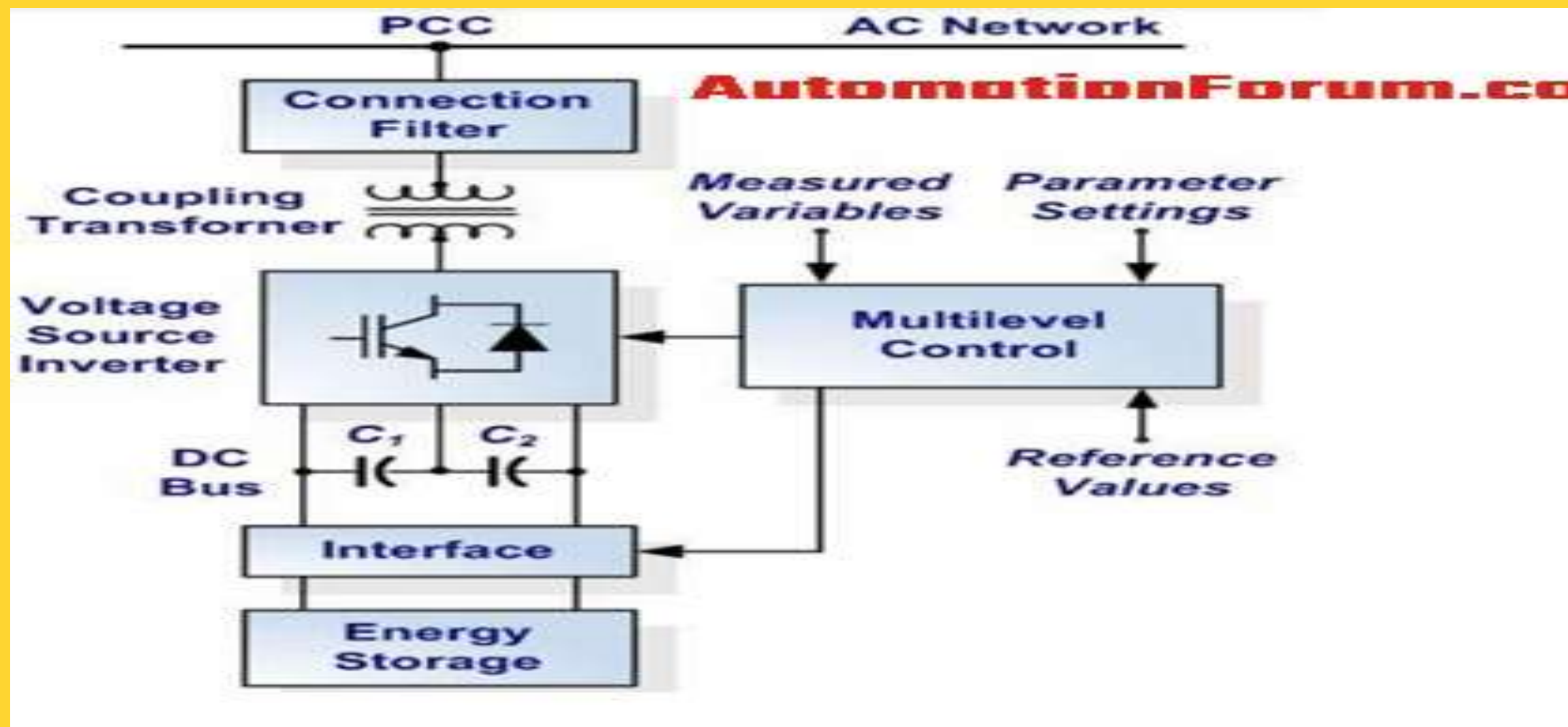
Advantages of DSTATCOM



- It is used to regulate the system voltage
- Reduction of the voltage harmonics and load compensation
- It can mitigate the voltage dips
- The magnitude and the phase angle compensation could be achieved by adding the proper active or reactive power
- Protection of the utility transmission and the distribution system in case of any voltage sags, flickers.
- Immunity against transients
- It can prevent the voltage sags from the nonlinear loads
- It can easily exchange the reactive power with the distribution system without using any reactor or capacitor.
- The size of the compensation system is reduced



Types of power quality conditioners





Types of power quality conditioners

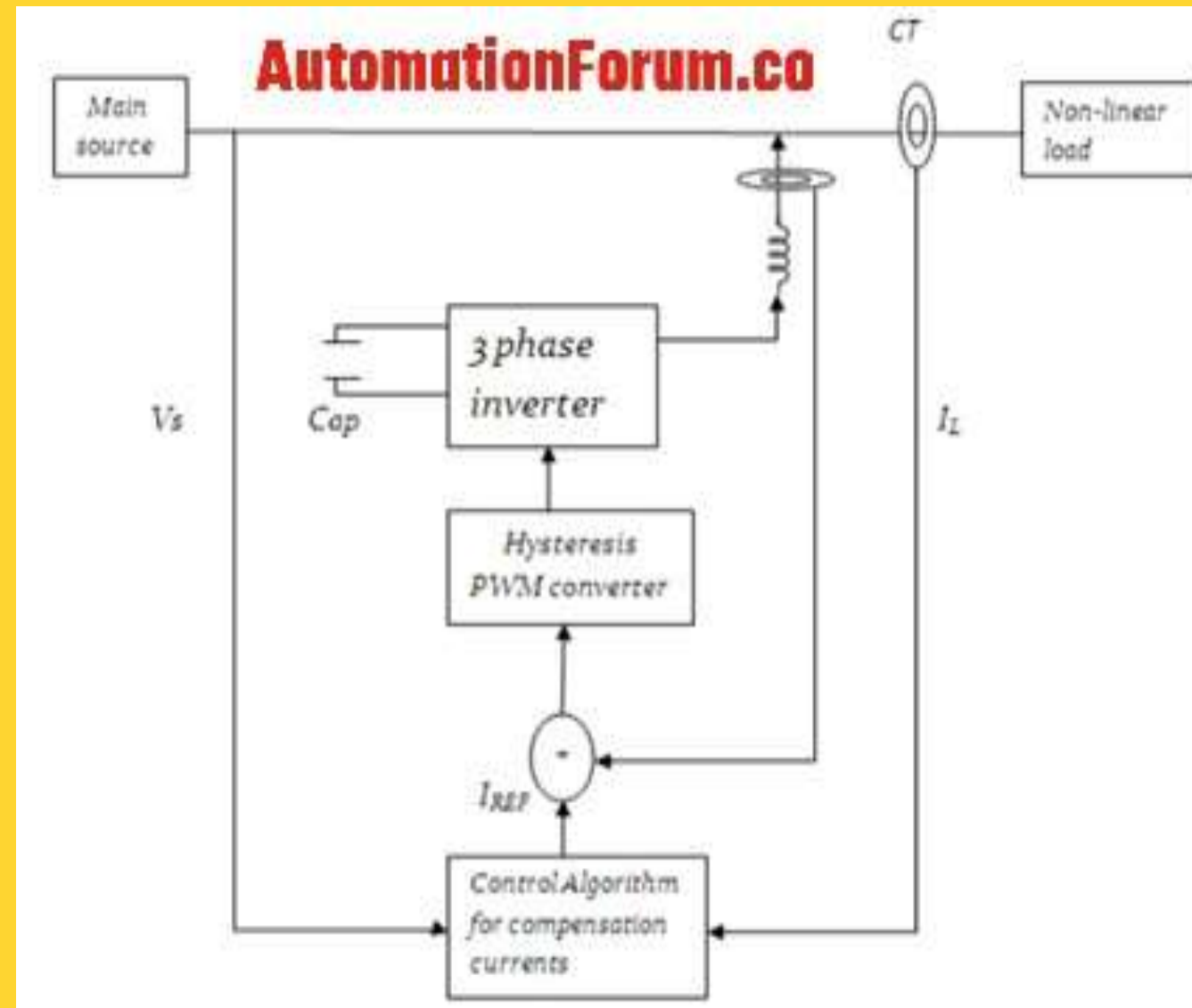


Active power filters The electronic power filters are electronic circuits that would pass a certain band of frequency and would reject the frequency which is not in this band. This type of power filter can compensate for the harmonics without using any reactive power. This type of filter would compensate for the voltage or current harmonics by injecting the harmonic signal measured. The injected voltage or current harmonic signals into the power system network would have the same magnitude and different phase, of the measured harmonic signal.

This device has a bridge rectifier and it would eliminate the harmonic current with the help of the switched-mode power converter. A compensation current will be created by the power converter and this would be useful to handle the non-linear load. This device has a capacitor to store energy and also has a voltage source inverter.



Types of power quality conditioners





Types of power quality conditioners



Shunt active power filter

This type of power filter would operate by imposing equal and opposite harmonic compensating current to the improper load. This would operate as a source of current by laying or adding the harmonic component which is generated by the load but it will be phase shifted. We can connect this type of active power filter against any load to do the power compensation.

Series active power filters

This type of filter can compensate for the current system distortion which is caused by the nonlinear loads. This type of active filter would impose high impedance by creating a voltage that has the same frequency of the harmonic component of the nonlinear load which is to be removed. This device would act as a controlled voltage source.



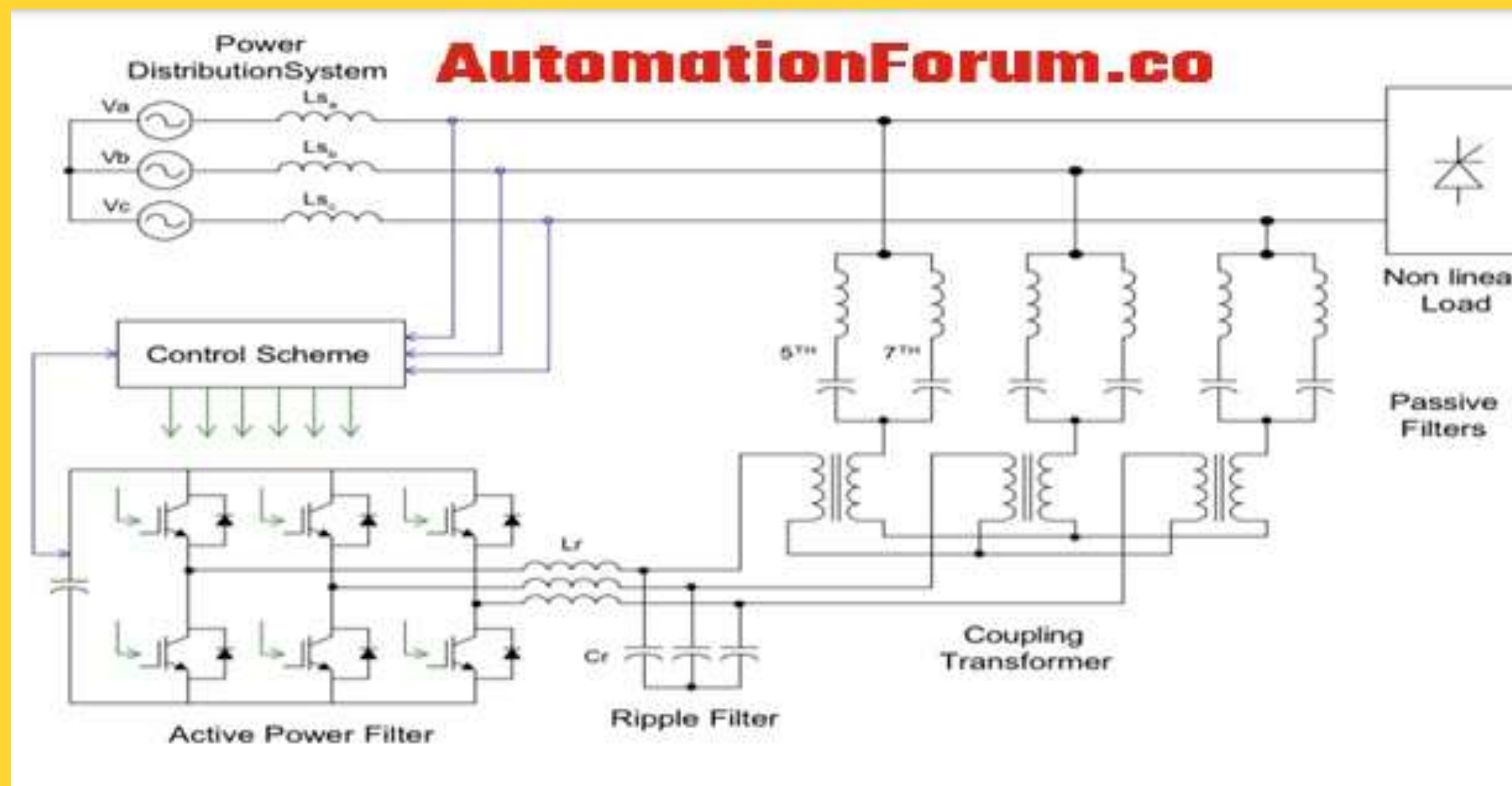
Types of power quality conditioners



Hybrid active power filter: This type of power filter operates by controlling the amplitude of the voltage component across the coupling transformer. So by doing this the power factor of the power distribution system can be adjusted. There will be a higher voltage across the filter capacitor due to the control of the load power factor. This type of power filter will be very useful for power conditioning.



Types of power quality conditioners





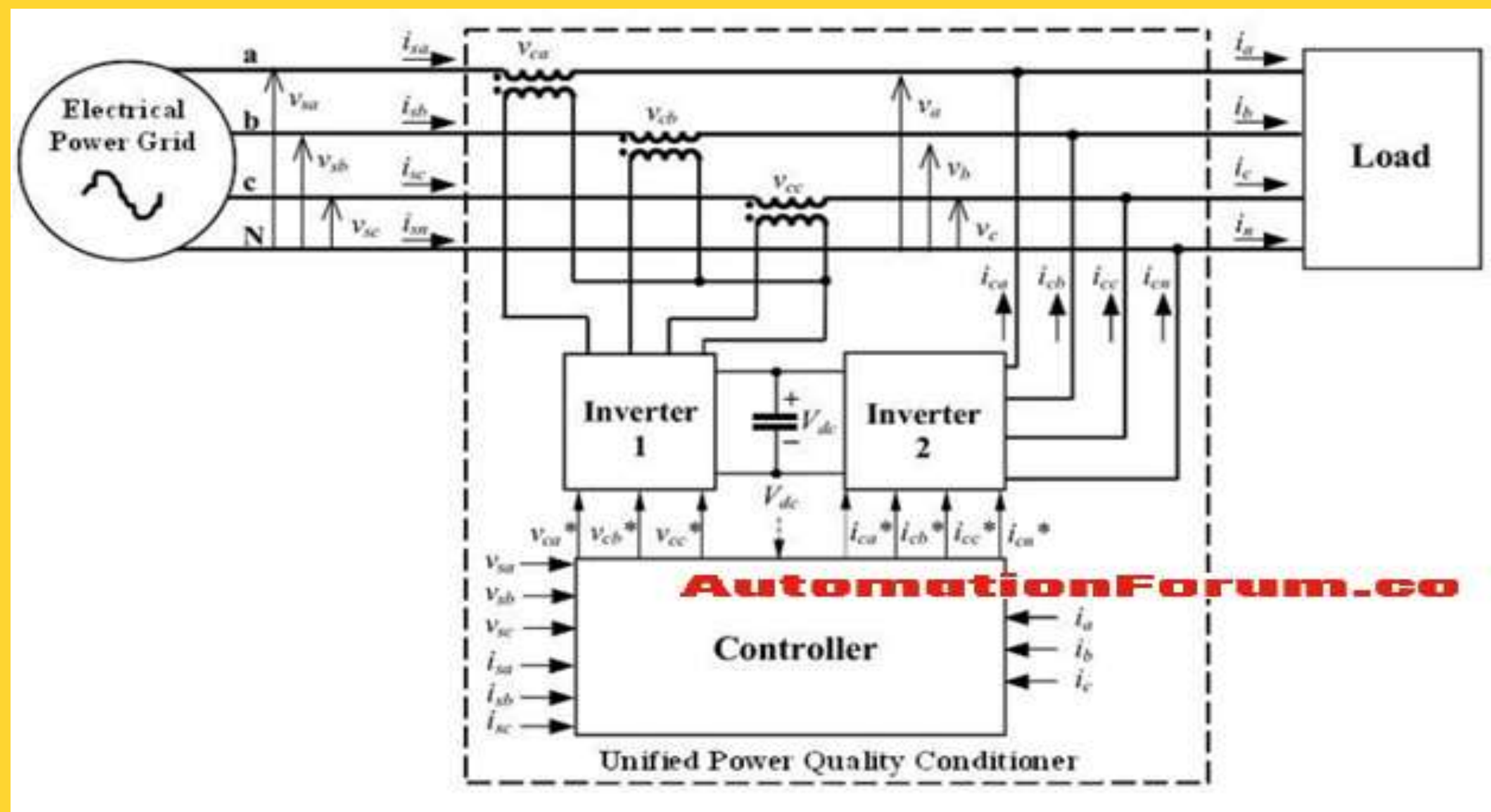
Types of power quality conditioners



UNIFIED POWER QUALITY CONDITIONER: The UPQC is a combination of shunt and series active power filters. The shunt and series power filter are used to compensate for the source current and also to mitigate the problems in the source voltage. So by using a UPQC we can solve most of the power quality problems. This device is composed of two voltage source inverters and it is connected to the capacitor. One of the voltage inverters will be connected in series with the AC line and another one will be connected in parallel to the AC line. The UPQC would decrease the harmonics in the supply current and because of this, the current quality can be improved. This device can compensate for the voltage distortion and also the voltage imbalance.



Types of power quality conditioners





Types of power quality conditioners



Advantages of active harmonic filter

- Compensation of harmonics
- All the unwanted harmonics are removed by using a single filter
- The power system stability is improved because there is no parallel resonance
- Dynamic performance and operates according to the change in the load
- These devices can be programmed in a way that it can remove the harmonics without compensating the reactive power
- It can be programmed to remove a specific number of harmonics



THANK YOU