FAQ

FAQ 1 - A measurement device (KVARh) measures the reactive power hour upon (Q =*VI* sinφ), how this equation is not correct?

Answer. The measurement devices can't measure the amount of electrical energy directly.

For (KWh), we design and make a device to measure (*VI* cosφ), then upon our knowledge, we name it the KWh meter. When our knowledge is correct, the measurement is correct.

Also, for (KVARh), we design and make a device to measure (*VI* sinφ), then upon our knowledge, we name it the KVARh meter. When our knowledge is incorrect, the measurement is incorrect.

FAQ 2 - If (Q = *VI* sinφ) is incorrect, how the calculation of reactive power for power factor improvement by capacitor banks is correct?

Answer. The reactive power has application in inductance and compensating of inductance by capacitance. Both sides (inductance and capacitance) could calculate by a unique equation, old (*VI* sin φ, VAR) or new ($\frac{1}{\pi}$ *VI* sin φ, Watts).

Therefore, either an old or a new statement would be applicable to apply both sides. For this reason, the reactive power calculation for compensation of reactive power by

(*VI* sin φ, VAR) was applicable without any problem.

FAQ 3- Is it necessary to change the devices for reactive power measurement?

No, by the new reactive power definition, it is not necessary to change the measurement devices. It is enough to use the relationship between measurement units.

The relationship between measurement units would be:

$$1 \text{ Watt} = (\pi) \text{ VAR} = 3.14 \text{ VAR}$$

FAQ 4 - If the power definition in the sinusoidal system has a sequential incorrect assumption, how has it worked properly for 100 years?

Answer. All incorrect statements in the sinusoidal system are misinterpretations and have no effect on current operational works in the linear loads; therefore, there were no doubts about the conventional concepts during the years.

Remember, the amount of active power (P = *VI* cos φ), apparent power (S = *VI*), and power factor (cos φ) are correct and remain unchanged.

Even the amount of reactive power (Q =*VI* sinφ) had no operating difficulty with the reactive power`s calculation or measurement (FAQ 1 & 2).

FAQ 5- Why the power definition in the sinusoidal system must change when it practically works despite some items having errors?

Answer. The erroneous items in the sinusoidal system had no affection on the practical works in linear load but had unbelievable inhibitor effects in the nonsinusoidal system.

Indeed, the improvement of power definition in sinusoidal must be before the nonsinusoidal system.

Almost all researchers had kept their minds concerning sinusoidal concepts. Therefore, we can't be successful in nonsinusoidal research until removing incorrect items from the sinusoidal system.

The improvement of power concepts in the sinusoidal system would be the first step toward perfect and successful nonsinusoidal research.

Whenever, we accept the active and reactive powers have the same essence and are not perpendicular, then we can discuss the P&Q conversion subject, which would be a new era in the power sector.

FAQ 6 – Why isn`t an executable and practical power definition in the nonsinusoidal system after 100 years of researches?

Answer. The presented interpretations by scientists couldn`t represent a comprehensive, universal, and applicable procedure for power theory in nonlinear loads.

Almost all authors who propose and challenge the power definition in the nonsinusoidal system, deeply believe that all existing knowledge on the sinusoidal system is correct.
They have a pre-assumption in their minds and use conventional concepts in their research as a fact, and unwanted lead the reasoning toward avoiding any opposition to the existing knowledge in the sinusoidal system.
the lack of success in the nonsinusoidal system stems from misinterpretations of the sinusoidal system. It is difficult to find a paper in the nonsinusoidal system without reference or backing to one of the conventional concepts, e.g., ($Q = VI \sin\varphi$).

FAQ 7 – It is claimed that the power generators and power supply network can't supply current harmonic currents, while most harmonic currents exist in the network, and the generators provide the demand.

Answer. The presented recommendations are theoretical and are presented for obtaining the perfect performance of the power supply system.
The harmonic currents in the network bring several serious problems, as followings:

1) Extra joule's copper losses in the conductors and transformers.
2) Extra iron losses in the core of power transformers.
3) The harmonic currents cause line voltage harmonics due to the network`s impedance.
4) The instability in the performance of the power generator system.

FAQ 8 - We can measure harmonic current in any circuit, so why claimed that we can`t calculate harmonic currents?

Answer. There are differences between the measurement and calculation. During the current measurement, we have an actual circuit on the ground and real-time induction of magnetic flow, which is sufficient for measuring the current`s specifications. But, during the calculation, we need to know the current waveform at the intended line and have the academic knowledge for harmonic currents` calculating without the existence of nonlinear apparatus.

There are some procedures for real-time calculating of harmonic currents for harmonics measurement devices, which are usually used in instruments` software, e.g., the Fast Fourier Transform (FFT).