

Economizer® Fundamentals

The Economizer® is unique in its kind and is designed to save energy (kWh). This device is a magnetic chemical mixture protected by a polymer chain, which acts upon the electric power passively, "harmonizing" electrons and "creating" an external magnetic field to reduce the loss of photons, by taking advantage of electromagnetic field conductors. The devices rely on electrical flow (current) or electrical excitation to reach peak efficiency.

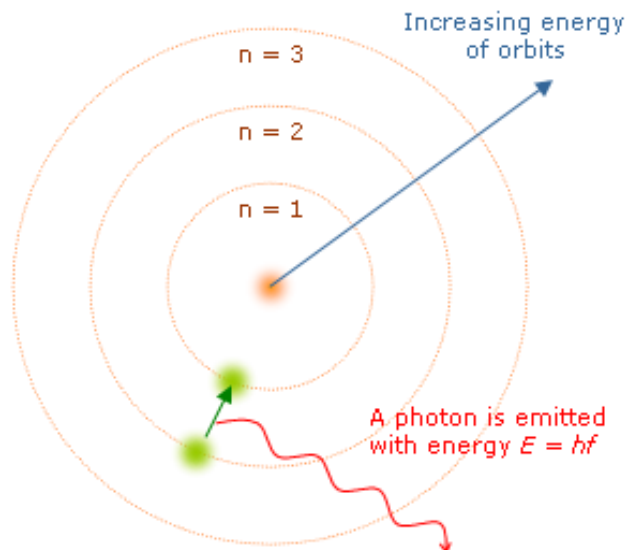
To explain in detail the operations of the Economizer® refer to "Bohr's Atomic Theory", in which we can explain the stability of matter with the emission and absorption spectra (very important to the Economizer).

The electrons do not radiate energy (light) if they remain in stable orbits.

But if you jump from a lower energy orbit to a higher energy, the electron absorbs a quantum of energy (an amount equal to the difference in energy associated with the orbits concerned).

If the electron moves from a higher energy orbit to an inner orbit, it loses energy and lost energy is released abroad in the form of radiation (light): the electron emits a quantum of energy, a photon.

Niels Bohr concluded that the frequency of light emitted by an atom is related to the change in energy of the electron, according to Planck's quantum rule.



It is here the Economizer® manages a change, with its physical and chemical properties of electrons which are driven by the magnetic forces of the device (pre-

loaded on the same stream for 120 days to get 100% of its operation) significantly reducing the loss and increasing photon energy in the electrons.

(Maxwell) By "Amperes general law" confirm that an electric field that varies with time produces a magnetic field. The Economizer® decreases the density of the electrical flow or electrical excitation. This is because of the materials ("transition metals" among others) of this fact, including its outer layer made of ABS polymers chain, which keeps the device in excellent operating conditions for about 5 years.

Benefits

A purer energy (a more coherent form of energy)

Lower temperature????(lowering conductor temperature)

Considerable reduction in total harmonic distortion resulting in lowering current demand

Contributes to the improvement of power factor

Contribute to a positive environmental impact.

Basis of the Economizer®

The physical properties of a compound depend mainly on the type of bonds that hold atoms in a molecule. These bonds indicate the type of structure and predict their physical characteristics. These characteristics influence the properties of chemical compounds.

Ionic bonds: These bonds are formed when an atom loses electrons relatively easily (metallic), reacts with another that has a great tendency to gain electrons (non metallic).
Metallic bonds: this is the type of bond that makes metal have certain properties such as being a conductor of heat and of electricity; the hardness and the melting point temperature.

The composition of Economizer® includes transition metals. The name "transition" is from a feature shown by these elements to be stable by itself without a reaction with another item. When your missing an electron from the last layer of valence, it completes itself by extracting an electron from the inner layers. In order to maintain stability, that sub layer now missing an electron will complete itself by extracting another electron from another layer. And so this phenomenon is called "electronic transition." This also has to do with these elements that are so stable and difficult to react with others. The broadest definition is the one traditionally used. However, many interesting properties of transition elements as a group are the result of its partially completed sub shell.

The electrons describe circular orbits around the nucleus of the atom without radiating energy. (First postulate)

The cause of the electron not radiating energy in its orbit is at the moment, a postulate, since according to classical electrodynamics, an accelerated moving charge will emit energy in the form of radiation.

$$k \frac{Ze^2}{r^2} = \frac{m_e v^2}{r}$$

The first term is the electric force or Coulomb's law and the second is the centrifugal force, k is the constant of the Coulomb force, Z is the atomic number of the atom, e is the electron charge, m_e is the electron mass, v is the electron velocity in the orbit and r is the radius of the orbit.

In the above, we can solve the radius, getting:

$$r = k \frac{Ze^2}{mv^2}$$

And now with this equation and knowing the total energy is the sum of the kinetic and potential energies:

$$E = T + V = \frac{1}{2}mv^2 - k \frac{Ze^2}{r} = -\frac{1}{2} \frac{kZe^2}{r}$$

Not all electrons in orbit are permitted, only those that can be found in orbits whose radius meets the angular momentum (second assumption).

The electron, L is an integer multiple of

$$\hbar = \frac{h}{2\pi}$$

This condition is written mathematically:

$$L = m v r = n \hbar$$

with $n = 1, 2, 3, \dots$

From this condition and the expression for the radius obtained before, we can eliminate v and maintain the quantization condition for the radius allowed:

$$r_n = \frac{n^2 \hbar^2}{k m_e Z e^2}$$

with $n = 1, 2, 3, \dots$

Subscript introduced this term to emphasize that the radius is now a discrete size, unlike what was in the first postulate.

Now, giving values to n , principal quantum number, we obtain the radii of the allowed orbits.

The first of these ($n = 1$) is called the Bohr radius:

$$a_0 = \frac{\hbar^2}{k m_e e^2} = 0.52$$

Expressing the result in angstroms.

Similarly, we can now replace the r_n radii allowed in the expression for the energy of the orbit and obtain the energy corresponding to each level allowed:

$$E_n = -\frac{1}{2} \frac{k^2 m Z^2 e^4}{n^2 \hbar^2}$$

We can express the remaining energy for Z and n as:

$$E_n = \frac{Z^2}{n^2} E_0$$

The electron allows the emission or absorption of energy only in the transfer from one orbit to another. This change in orbit of the electron emits or absorbs a photon whose energy is the energy difference between the two levels (third postulate).

This photon, according to Planck's law has energy:

$$E_\gamma = h\nu = E_{n_i} - E_{n_f}$$

Where n_i identifies the initial orbit and n_f the final, and ν is the frequency.

Then the frequencies of the photons emitted or absorbed in the transition are:

$$\nu = \frac{k^2 m_e Z^2 e^4}{2h\hbar^2} \left(\frac{1}{n_f^2} - \frac{1}{n_i^2} \right)$$

Sometimes, the frequency instead tends to the inverse of the wavelength:

$$\bar{\nu} = \frac{1}{\lambda} = \frac{k^2 m_e Z^2 e^4}{2hc\hbar^2} \left(\frac{1}{n_f^2} - \frac{1}{n_i^2} \right)$$

Gauss's law explains the relationship between the flow of an electric field and a closed surface.

Power flow is defined as the amount of electricity passing through a given surface. Analogous to the flow of fluid mechanics, this does not transport an electric power field, but it helps to analyze the amount of the electric field that passes through a surface. Mathematically expressed as:

$$\Phi = \oint_S \vec{E}_{(r)} \cdot d\vec{S}$$

The law says that the flow of the electric field through a closed surface is equal to the ratio between the loads (q) or the sum of the charges in the interior of the surface and the electric permittivity in vacuum (ϵ_0) is as follows:

$$\oint_S \vec{E} \cdot d\vec{S} = \frac{q}{\epsilon_0}$$

The differential form of Gauss's law is:

$$\vec{\nabla} \cdot \vec{E} = \frac{\rho}{\epsilon_0}$$

Where ρ is the charge density. This expression is a load in a vacuum, for general cases, you must enter a quantity called the electric flux density (D) and our expression forms:

$$\vec{\nabla} \cdot \vec{D} = \rho$$

Experimentally, it brings us to the conclusion that magnetic fields unlike electricity, do not begin and end at different loads.

Gauss' law for the magnetic field.

This law primarily indicates that magnetic field lines should be closed. In other words, it is said that on a closed surface, we will not be able to enclose a field source or sink; regardless this expresses the non-existence of magnetic monopole. Mathematically this is expressed as:

$$\vec{\nabla} \cdot \vec{B} = 0$$

Where is the magnetic density flow, also called magnetic induction?
Its equivalent integral form:

$$\oint_S \vec{B} \cdot d\vec{S} = 0$$

As in the integral form of the electric field, this equation only works if the integral is defined on a closed surface.

Ampere formulated a relationship to a stationary magnetic field and an electric current that varies in time.

Ampere's law tells us that the circulation in a magnetic field along a closed curve C is equal to the current density on the surface enclosed within the curve C, mathematically expressed as:

$$\oint_C \vec{B} \cdot d\vec{l} = \mu_0 \int_S \vec{j} \cdot d\vec{S}$$

Where is the magnetic permeability in a vacuum?

When this ratio is considered with fields that do vary over time, miscalculations occur, such as to violate the conservation of charge. Maxwell's equation corrected this to obtain non-stationary fields and then they could be tested experimentally.

Maxwell reformulated this law as well:

$$\oint_C \vec{B} \cdot d\vec{l} = \mu_0 \int_S \vec{j} \cdot d\vec{S} + \mu_0 \epsilon_0 \frac{d}{dt} \int_S \vec{E} \cdot d\vec{S}$$

In the specific case, this relationship corresponds to stationary Ampere's law. This also confirms that an electric field that varies over time produces a magnetic field and is consistent with the principle of conservation of charge.

In differential form, this equation takes this expression:

$$\vec{\nabla} \times \vec{B} = \mu_0 \vec{j} + \mu_0 \epsilon_0 \frac{\partial \vec{E}}{\partial t}$$

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