



順富國際機電有限公司
SHUN-FU Electronics Industrial CO., LTD

+ POWER
SOURCES

順富 節能系統

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Introduction brief introduction of company

The company was founded in 1991. Under the leadership of our Chairman, Mr. You Jin Shui, it has become a leading hi-tech electrical energy saving product manufacturer with full R&D, manufacturing, sales and service capabilities.

Our products are subject to the most stringent tests both in-house and in field tests. Apart from the basic energy saving function, more importantly is that our products have added voltage stabilization and reactance compensation features. These features compared much more favorably to other brands available and our whole product range is suitable for use worldwide.

With today's shortage in energy resources and the lack of other alternatives, not ignoring the need for environmental considerations, the first thing we can only do is to conserve electrical energy. This is the direction we are heading in the development of our product range.

In order to conserve energy, we need to conserve on our use of electricity, hence electrical energy saving products will be the essential items for all households and enterprises in the future.

公司簡介

本公司創立於民國 80 年，在董事長 游金水先生的領導下，擁有研發、生產、銷售各部門具規模的節能設備產品企業，主要營業項目為高科技節能系統。

本公司所研發之高科技節能（電）設備，都經長期嚴格的試驗與測試，除具備一般節電功能外，更重要的是本節電設備增設的穩壓功能及電抗式功率增益系統，較市面上任一廠牌更加完備，所有的產品、機種適合世界各國各地區使用。

在全球能源來源日益短缺，開發不易，環保意識抬頭，新一代替代性能能源尚未開發成功之時，我們所要做的第一件事就是節約用電，而本公司發展方向就是從節約用電的電力管理系統開始。

所謂節約用電就是得先做到省電，因此節電設備必將是未來每個家庭及企業界未來的必需品。

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Power Quality

Ensuring the power stability and quality are the most fundamental principles of any utility company. However, higher level of power quality is required as more non-linear loads are connected to the grid. This is a key issue utility companies, industries and the research institutes are focusing their attention on. The problem of power quality can be attributed to include the following: 1) Transient voltage surges and voltage disruptions, 2) waveform distortion including different levels of harmonics and voltage sag, 3) Voltage imbalance, 4) Flicker and 5) Frequency changes. At present, Taiwan faces more prominently the problem of power quality, for example, because of frequent voltage dips in Hsinchu Science Park (leading to equipment shutdowns and production losses), large amounts of harmonics are generated by electrical and electronics equipment of commercial & industrial enterprises, causing stress to the power system, increasing frequency of equipment malfunction and reducing life span of the equipment. Loads like electric furnaces of the steel industries and welding machines are also causing flickers.

From the standpoint of the utility company, they must protect the complete electrical system's voltage quality and stability. On the other hand, consumers must also ensure that their equipment do not contribute to the "contamination" of the power supply in order to maintain a good quality power system. Consumers must also learn how to use different types of equipment without causing too much stress on the system as well as reducing "interferences" between machines and maintain safety.

The techniques of improving the quality of the power supply may include the use active and passive harmonic filters, transient voltage surge suppressors, static VAR compensators, voltage regulators

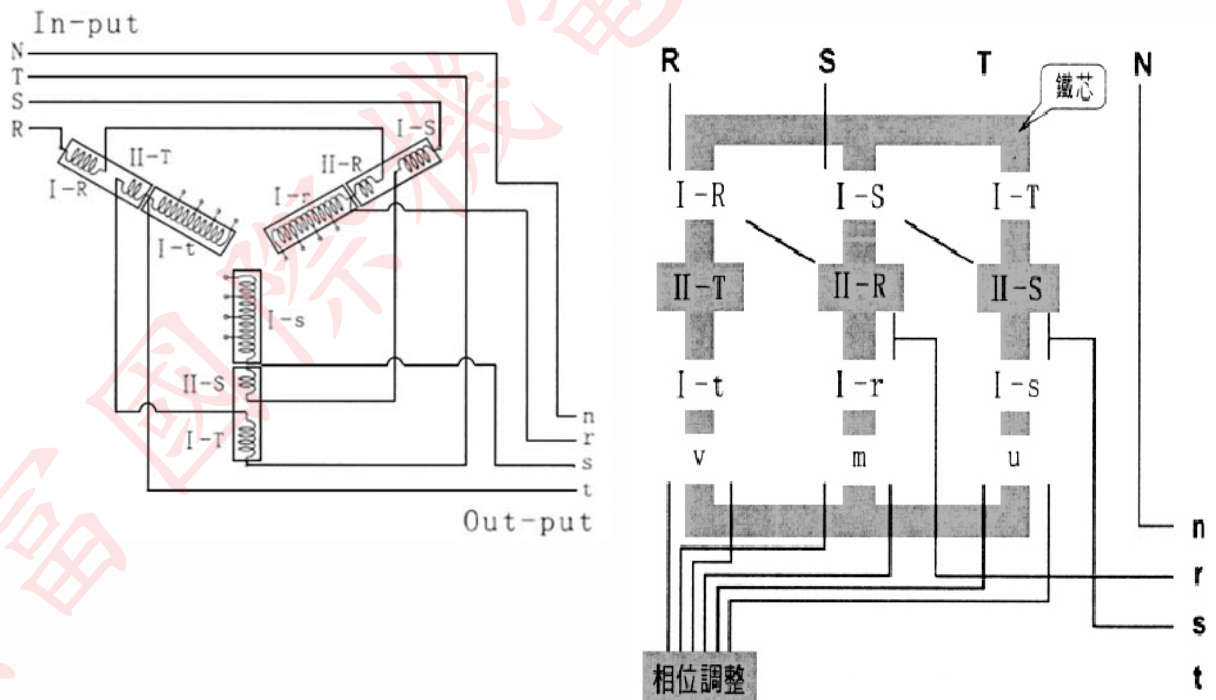
(Extracted from Industrial Technology Research Institute).

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Principles of Energy Saving

Reactance filtering adopts the principles of micro-magnetic field theory and the balance of electro-magnetism to regulate the balance of the 3 phases, provides true power to the loads using new hi-tech materials to absorb the reactive power and upper harmonics, and eliminates exciting currents. By method of series connection of the main meter and main circuit breaker, consumers can operate their equipment with true quality power, hence achieving the result of energy saving.



結線原理方塊圖

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「電污染」的二種來源

2 Sources of “Contaminated Power”

第一、電力系統供電時，機器會引起『瞬流』和『浪涌』兩種物理現象，造成正弦波上有毛刺（交流電正弦波應該是光滑的），這就是『電污染』，浪費的電就從這裡產生。

One: When a power system supplies power, electrical machines will cause transient and power surge which will produce spikes in the sine wave (an alternating current sine wave should be a smooth one). This is called “power contamination” and power wastage is produced.

第二、當電輸送到企業時，企業內部也會有一個小電網，陳舊的電機、電器效率非常差，產生大量的『瞬流』和『浪涌』在小電網徘徊，浪費了大量的電。事實上，不管是工業企業還是平常人家，電表上顯示的用電數字，並非實際需要的電量，其中有相當大的部分是因『電污染』浪費掉的。

Two: When utility power is fed to an enterprise, there will also be a small power network within the enterprise. Old electrical machines are less efficient and produce large amount of transient and surges within the small power network, resulting in a large amount of power wastage. In fact, regardless whether the application is for domestic or industrial usage, the meter reading does not represent the actual power needed and a large portion of it is wasted by the “power contamination”.

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市售省電器宣稱功效

Advertised features of commercially available energy saving devices

實際情形

Actual Effects

以電容器改善功率

Power Factor Enhancement By Capacitors

效果不佳，通常只有 5% 左右，且必須大量裝設在負載近處，既不方便又不敷成本，在輕載時，會發生無效電力過多，使功率原素發生「超前」現象

Not so effective, normally only about 5% savings and also need to install large quantity near to the loads, hence incurring higher costs. Under light loading, more reactive power is created, causing the power factor to "over lead".

以 IC 回路電壓自動控制

Using IC Automatic Voltage Control

此種模式僅有 5%-10% 或更少的省電效果，而本身容易發生故障，使用期限不夠長，容易產生噪音

Has only 5%-10% or less saving effect. This method is prone to malfunctioning and has shorter life span. It also creates higher noise level during operation.

以變壓器降低電壓

Using transformer to reduce voltage

容易讓變壓器本身無用的負載增加並產生高熱，法顧及向量相位平衡，省電效果不佳，如遇電壓不足或下降過多，將直接損壞運轉中的機械。

Causes overheating due to unnecessary overloading of the transformer. This method is unable to cater to phase balancing, hence is less effective. It can also cause direct damage to rotating machines in the event of under-voltage or sudden drop in voltage.

變頻

Frequency Converter

在每個機具上都必須對應安裝，並不實用。對機台設備較多的工廠來說，花費過高，還加上難以控制變頻所產生的噪音。

This method needs to have one device installed to Every rotating machine, hence incurs higher costs. It is not suitable for factories with many rotating machines.

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一般省電裝置方法

Typical methods of energy saving

改變用電系統（非法偷電）

Alter the electrical system (pilferage)

一般式改善無效電力耗用裝置

Typical reactive power improvement devices

實際情形

Actual Effects

即一般所謂的“偷電”，可能模式如下：

- 在電表上用磁電方法使電表運轉速度下降，或更改電表之齒輪比
- 在電表上裝設電子裝置使電表速度下降
- 運用各種方法改變電表上的讀數
- 直接繞過電表私接電線

Typical methods of pilferage:

- Using electromagnet to slow down the rotation of the meter or change the gear ratio of the meter
- Using electronic device to slow down the rotation of the meter
- Using various methods to alter the readings of the meter
- Connecting load directly by by-passing the meter

- 該技術謹能省正弦波上的上弦無效部分，而無法與電抗濾波節電器上下弦省相比
- 省電效果為電抗濾波節電器的一半
- 功能較差的“省電器”無法兼顧改善相位不平衡的功能

- This technology can only save on reactive portion on in the first half of sine wave and cannot be compared with reactance filtering energysaving devices which save on both halves of the sine wave.
- Energy-saving effect is only half compared to reactance filtering device
- Less efficient energy-saving devices are unable to cater to improving phase angle imbalance

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順富節能設備原理 Principles of Shun-Fu Energy Saving Device

設備所需電力
電力公司輸送的電力
設備真正所需電力
本公司產品可濾除的部份

Equipment required power
Power supplied by utility company
Equipment actual required power
Portion that can be filtered by our products

節電作用

Energy Saving Functionality

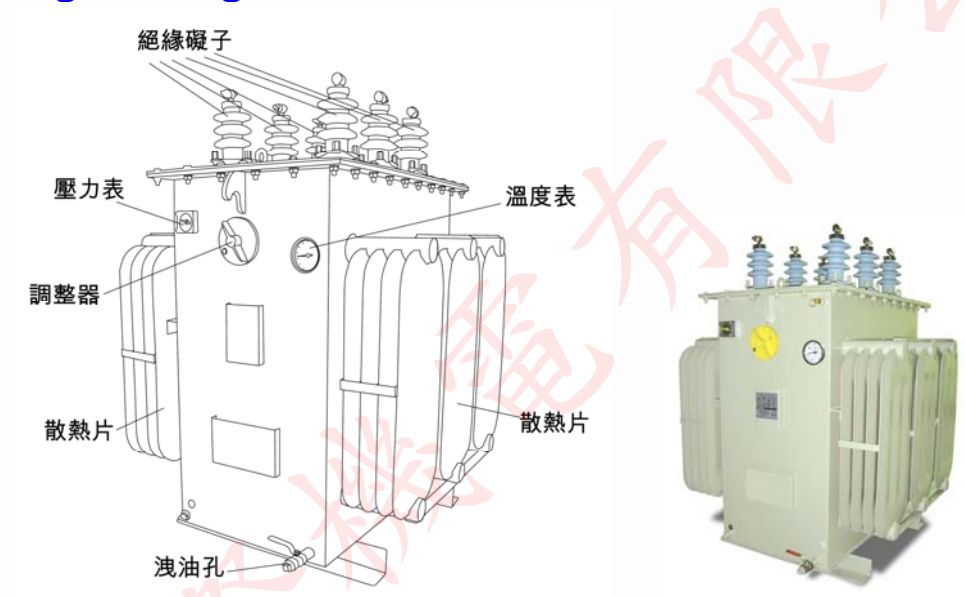
它的作用正如自來水管上的濾水器一樣，除了能過濾污染的電力外，還能依負載的實際運轉狀況，提供給負載一種更優質，更穩定，更實用，經濟的工作功率，做最有效的運用，而達到節電效果。

Its functionality is like a piped water filter. Apart from filtering “contaminated” power, it can also provide the loads better quality, more stable, more practicable and more economic working efficiency, achieving the energy saving effect with the most effective operation.

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High-voltage Product



產品規格

高壓：35kV 以上包括 35kV，22kV，10kV，6kV 等

(容量 300kVA—5000kVA 以上)

低壓：適用 400V，220V 三相或單相等

(容量 10kVA—2000kVA 以上)

Product Ratings

High-voltage: Up to 35kV including 22kV, 10kV and 6kV

(Ratings from 300kVA up to 5000kVA)

Low-voltage: Suitable for 220-440V, 3-phase or single-phase

(Ratings from 10kVA up to 2000kVA)

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簽約保固

保證每月平均可節省流動電費達 10—30%，未達此一標準時，企業用戶可要求拆機退費。

Written Guarantee

We guarantee 10-30% savings on the monthly electricity bill on a running average. If this standard is not attained, the consumer can request the removal of the energy saving equipment and have the payment refunded.

品性保固

順富節能設備中無任何電子零件，並採用進口高品性金屬材料，無故障率。在正常使用情形下，順富提供兩年保固以及十年保修的服務。而在內部節能材料無衰退狀況下，產品壽命預估可達二十年以上。

Product Warranty

There are no electronic parts in Shun-Fu energy saving products and we use the highest quality imported materials. Under normal operating conditions, we provide a 2-year warranty plus a 10-year after-sales service on our products.

本裝置並具各種不同容量，可適用於任何用電環境，而通常一個電表只需要安裝一組適用容量的節能設備。

Our product range offers different ratings and is suitable for any electrical installation. In general, only one energy saving device of the appropriate rating is required for each electrical meter.

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安全至上

- 台灣經濟部標準檢驗局檢驗透過
- 電子試驗中心測試合格
- 富邦產物產品責任險新台幣 5000 萬

中華民國共和國 GB/1706.1-1998 及 GB/T2900.15-1997 安全檢測合格

Safety First

- Passed tests conducted by Ministry of Economic Affairs, Bureau of Standards, Metrology & Inspection, Taiwan.
- Passed tests conducted by Electronics Tests Center, Taiwan.
- Product liability insurance coverage by Fubon Insurance for NT\$50,000,000.

Passed tests in accordance to People's Republic of China's GB/1706.1-1998 and GB/T2900.15-1997.

本公司產品榮獲國家品性金像獎，希望能提升各產業的競爭力

Our products have been awarded the National Quality Gold award and we hope we can play a part in increasing your competitiveness.

絕對合法

- 不拆電表及高壓受電室封條
- 並使電表失效或倒轉
- 不繞電表或其他計器用電
- 不會違反台灣電力公司營業規則之竊電行為為規定
- 在不影響所有機台設備的情況下完成安裝
- 絕對在個用戶電源總開關之二側接線合法施工

Totally Legal

- No tampering of electrical meters or breaking the seals to HV incomer room
- Do not cause malfunction or reverse rotation of electrical meters
- No bypassing of meters, damage or change connections
- Do not violate Utility company's regulation on pilferage of electricity
- Install device under strict supervision to prevent damage to other equipment
Install device only at the load side of consumer's main incoming breaker

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有效節能

- 一般情形下，節電可達 10—30%（流動電費）
- 電流相位調整維持於適當狀況，因此延長電器設備之使用壽命
- 電流短路器的容許範圍預估可提升 15%以上
- 用電效率提升，減少無效電力
穩定電流，延長負載設備使用壽命

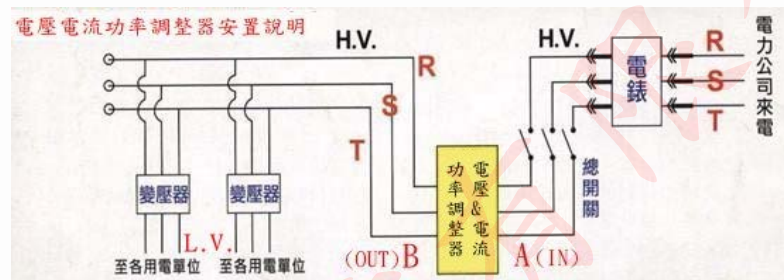
Effective Energy Saving

- Under normal operating conditions, savings can reach 10-30%
- Current phase angle regulation is maintained at normal operation, hence extending equipment life.
- About 15% increase in the permissible circuit breaker rating range
- Increase usage efficiency, reduce reactive power
Stabilize current flow, hence extend life span of equipment

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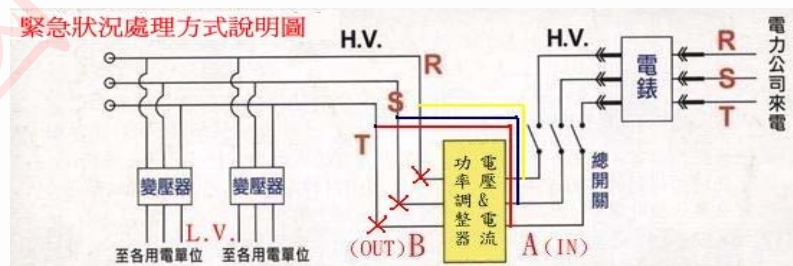
Seventh, sketch of erection site of equipment



This equipment connects the total side two times of switch in the ammeter back end of Utilities Electric Co.

Return circuit before installing: Outside line of Utilities Electric Co. → Ammeter → Master switch → Voltage transformer → Use electric load
Return circuit after installing: Outside line of Utilities Electric Co. → Ammeter → Master switch → This equipment → Voltage transformer → Use electric load

Deal with the way in eighth , urgent state



The urgent state hour of equipment fault is dealt with

When it is unusually unable to supply power normally that if this equipment happens, copies of R of output end (some B, OUT end) of equipment, S, T three phases are removed, connect to the original input end of the equipment directly (some of A, IN end), R end connects R end, S end connects S end, T end connects T end (three phases make sure not to mix connecting), can already resume supplying power normally.

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Ninth, energy-conserving rig up flow chart



1. Cut off the high-pressure switch of Utilities Electric Co.



2. High-pressure earth accident in order to prevent of end of electricity.



3. Put the equipment wanting to install the place.



4. Connect the equipment to go to once side cable of high pressure.



5. The equipment exporting and inserting high-pressure once side of voltage transformer.



6. Energy-conserving rig up.



7. Connect and go to the high-pressure switch of Utilities Electric Co.



8. Check whether the power system is normal and real.