VERDEK
Providing CNG Solutions by GALILEO

Enersave®

Besides the compressed gas, the largest operational cost of a CNG station is the electricity consumed to produce the compressed gas. This consumption represents over 10% of the total station billing and its optimization has a important effect on profitability.

ENERSAVE® is an intelligent system developed by Galileo, which adjusts electrical consumption according to the station vehicles attendant flow. Therefore, the electricity consumption is adjusted to the station's needs. In addition to savings of up to 50% in electric consumption ENERSAVE® also has other important advantages, described below.

Traditional Installations

The electrical consumption of CNG stations depends not only on quality and technology of the installed compressors but also on other parameters such as sales volume, storage capacity, etc...

Traditional CNG stations are equipped with one or more compression units which operate with storage systems whose capacities have been defined without exactly analyzing its needs.

In practice, an average CNG station, with a 470 SCFM capacity compressor will sell between 46.500 to 93.000 GGE a month. This means the compressor is being used at 30% of its maximum capacity. If we add up the daily operation hours, we'll learn that compressors operate between 5 to 10 hours a day. Since the demand varies dramatically during the day, the compressor will have to start and stop many times.

Every time the compressor starts and stops, it consumes an additional amount of unproductive energy that raises electrical consumption.

ENERSAVE® Advantages.

- Reduces power consumption up to 50%.*
- Allows the reduction of the hired available power by 30%.*
- Avoids approximately 2200 starts and stops a month.*
- Completely eliminates startup current peaks.
- Reduces unproductive energy consumption by about 70%.
- Reduces compressor wear, therefore increasing equipments life and reducing maintenance costs.
- Reduces required amount of CNG storage.
- Cos(fi)=0.91.
- Reduces costs by eliminating any penalties from the electricity utility for reactive power consumption.

	SOFT STARTER	ENERSAVE
STARTS/MONTH	2568	<300
UNPRODUCTIVE ENERGY CONSUMPTION [kWh/month]	1700	<500

*Real average data measured on stations with average sale volumes from 70.000 to 150.000m^3/mes

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It is important to note that usually the cost of electricity is split in two. On one side there is a charge for the consumed energy, and on the other a charge for the available hired energy, which in most cases is not fully utilized, but must be paid. These two each represent approximately 50% of the total cost.

A compressor with idle capacity -as is usually the case in CNG stations- will have a high percentage of its energy bill due to hired power, although in practice it only reaches this consumption at the startup current peak.

Compressor manufacturers usually report the equipments specific consumption in [kWh/GGE]. This figure represents energy consumption at full throttle and doesn't take into account the large number of startups caused by intermittent operation. This means that specific energy consumption in a real situation will always be larger than this reported value.

The difference between ideal and real power consumption is called operative overconsumption.

Figure 1 shows compared consumption values between an ideal compressor –no over consumption- and two sets of real values. Yellow dots represent stations equipped with ENERSAVE® and red dots represent traditional stations. It can be seen that energy savings reach up to 50%

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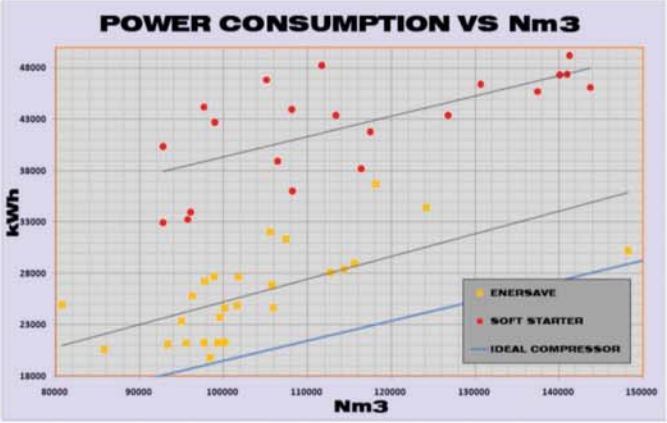

FIGURE 1
(Data Valid for MX2-132-3-1500-15)

As shown in figure 2, operative overconsumption increases with reduced compressor usage. If the compressor worked full time, the power consumption would be similar to the values stated by the manufacturer. Since no station has a steady customer flow 24 hours a day these are just theoretical values.

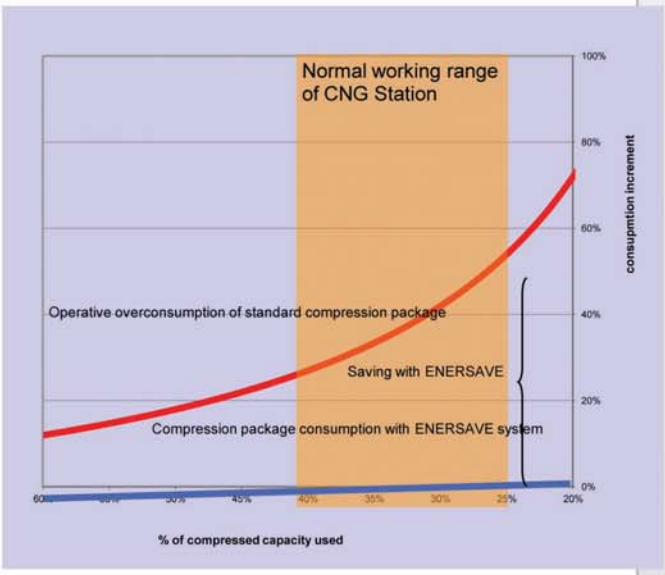

FIGURE 2

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¿What is ENERSAVE?

ENERSAVE is an intelligent system developed by Galileo, based on specific PLC programming, combined with a highly reliable electronic frequency variation system. This system regulates the compressor's pace so it is tailored to the variations of demand.

To make an analogy with everyday life imagine if you went all day from one place to other, running at the maximum speed that you can; how would you feel at the end of the day?

What people normally do is to walk slowly at some moments of the day, go faster on others, and run on others. This is what ENERSAVE does with your compressor.

The compressor learns day by day at what time it has to run, at what time it has to walk, and that makes the installation work more logically and efficiently.

In addition to savings on overconsumption ENERSAVE will allow the company to hire exactly the necessary installed power needed. With ENERSAVE the company avoids spikes and energy uses. ENERSAVE reduces your long term contract utility expenses.

Storage Volumes (Myths and truths)

It is often said that increasing the storage volume can reduce electric cost. While this is partially true, it requires additional investment, additional space and doesn't optimally solve the problem.
Studies carried out by Galileo for different CNG stations show that an increase in storage volume will partially solve the problem but the results are not comparable to those obtained by ENERSAVE. (See figure 3).

FAQ's

Does ENERSAVE add complexity to my equipment?

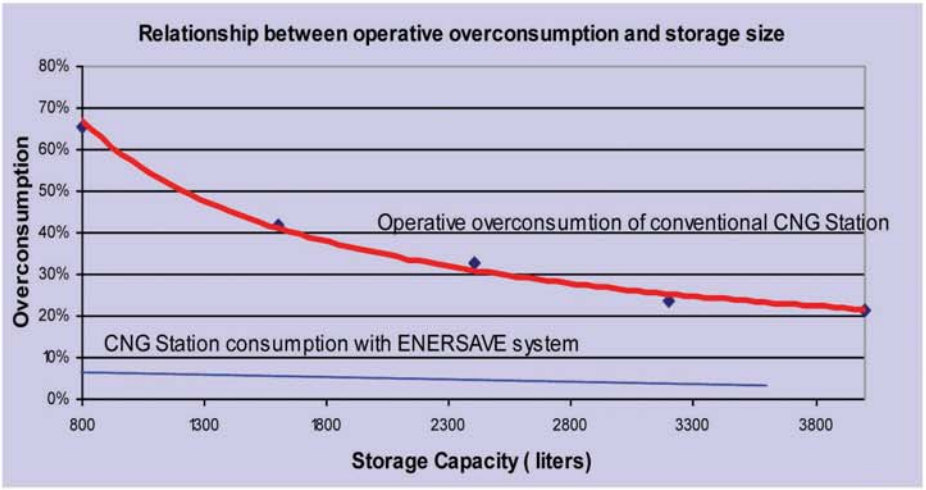
NO, although ENERSAVE is a high-tech system its installation is very simple and does not affect the rest of the equipment.

How much will I actually save?

The savings depend on the usage of the station but usually saves 50% of the power bill.

Which is ENERSAVE's payback time?

For traditional stations Enersave should have a payback of approximately 6 months.
With ENERSAVE your bottom line will immediately improve.



ENERSAVE ® is intelligence applied to the optimization of your CNG business

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