



CAPABILITY STATEMENT

in depth

HELP System Operation

The Technology Consortium, Ltd.

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BASIC TENANTS OF THE *HELP* SYSTEM

What is the *HELP* (High Efficiency Local Processor) System:

The *HELP* System is the modern and best way to control motor costs. Utilizing patented Smart Microprocessor technology in conjunction with proven Variable Frequency Drive (VFD) technology, savings are typically twice as much as was previously possible.

The *HELP* System also incorporates the latest in power alignment, protection, and bypass circuits. This teaming of technologies allows motors to run longer, safer, with significantly reduced operational costs, and without interruption.

In addition to the substantial savings and other performance attributes, the *HELP* System is the only fully “Turn-key”, retrofit solution to motor control savings and protection. Installation of the *HELP* System typically takes less than an hour!

The *HELP* System uses the Technology of the Future, to Save Energy Today...

HELP SYSTEM ATTRIBUTES

Significant HVAC Cost Reduction:

The *HELP* System is retrofit equipment that will **substantially reduce HVAC costs!** The patented *HELP* System technology has been proven in thousands of international installations since 2008.

Motors normally operate in on/off mode and have no way to compensate for changing loads and requirements. The need for flexible motor operation was satisfied when the VFD was introduced over twenty years ago. The VFD allowed for adjustments to be made in the speed of motors due to changing operating conditions. Utilizing the “Affinity Law”, (A slight reduction in motor frequency yielded significant energy reductions) resulted in significantly reduced power consumption. Hence, VFDs have been the proven and accepted method of reducing motor costs ever since.

However, this VFD technology had a flaw that prevented optimal operation. VFDs required some method of letting them know what speed they needed to run. This was the purpose of the controls known as either PIDs or PLCs. While these methods controlled the VFD with sufficient accuracy, they required some level of set-up and programming. These operations were an added expense and severely limited the flexibility of the controls system. Every time the motor requirements or operational parameters changed, a new “Program” needed to be written and incorporated. Since these control methods relied on finite (Limited) parameters, the resolution of the motor speed was also compromised.

All of these limitations and deficiencies were eliminated with the development and refinement of the Smart Microprocessor. The *HELP* System technology did not depend on set parameters and finite conditions. By utilizing an advanced Algorithm, there was no longer any need to set operational parameters. This Algorithm uses “Fuzzy-logic” and stepless controls to adjust the operation of the VFD with an infinite amount of adjustability. This rapid reaction to motor conditions utilized by the *HELP* System is what allows you to **optimize the way your motors operate.**

The Technology Consortium, Ltd. is the exclusive domestic source of the *HELP* System technology.

30-50% Savings Exceeds DoE & DoD Energy Objectives...



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HELP SYSTEM ANALOGIES

How the *HELP System* operates:

Picture trying to operate your car by turning the motor on & off to maintain highway speed. This is basically how all motors work, simply on and off. This is not the most efficient way to operate any equipment.

By adding a “Gas-pedal” to adjust motor speed, you could control how fast, or slow you drove your car. This refinement greatly improved operation, fuel economy, and passenger comfort. This is what the introduction of VFDs meant to the operation of motors. Unfortunately, this system still required constant input from you to maintain the proper speed and operation for a multitude of conditions. Sometimes this would lead to exceeding the speed required for safe operation, and led to additional “Operational problems”!

Therefore, a method was needed to improve operation; it is called “Cruise Control”. Think of the *HELP System* as cruise control for your electric motors. There is no longer any need to “Press-on-the-gas-pedal” in order to operate your motor at varying speed. With the *HELP System* all of the operation parameters of the motor are controlled by the Algorithm controlled Smart Microprocessor. The *HELP System* constantly adjusts the operation of your motor to compensate for changing conditions. Likewise, you do not need to rely on antiquated methods to control the results.

Second Analogy:

Think of the *HELP System* as an automated “Dimmer switch” for your electric motors! You no longer need to operate motors as simply on or off, the *HELP System* will now automatically adjust operation based on needs and conditions.

THE HELP SYSTEM IN HVAC EQUIPMENT

HVAC Operation of the *HELP System*:

Prior to the introduction of the *HELP System*, HVAC systems were not good candidates for VFD technology. These applications needed greater response and adjustability than the standard PID/PLC controls were capable of providing. Additionally, PID/PLC controls required the added cost of a control program. The *HELP System's* Smart Microprocessor/Algorithm solved these problems with instant, infinite, and automatic adjustment capability.

All types of HVAC systems will benefit from the introduction of *The HELP System* technology. In addition to the significant amount of energy that will be saved, the *HELP System* will also dramatically improve the comfort level of the “Conditioned” space. By keeping air moving over the active cooling coils, a much greater amount of humidity is removed from the air. This produces a much more stable environment without the hot/cold temperature fluctuations prevalent in standard HVAC systems.

By reducing the speed of your motor, as well as the amount of cycles in your HVAC System, equipment life is substantially increased, and maintenance is drastically reduced. Both of these attributes greatly reduce overall facility costs and are an added benefit to the *HELP System*.

Retrofit Existing HVAC Systems without Replacement...



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ADVANTAGES OF THE HELP SYSTEM

Advantages of the *HELP System*:

- With advanced Microprocessor technology, the *HELP System* is **Proven to be twice as efficient** as existing motor control technologies.
- The *HELP System* is a **“Turn-key” control panel** and does not require any programming; total installation is accomplished in less than an hour.
- Special protection devices in the *HELP System* assure that existing (Non-VFD) motors are not harmed.
- **Dual bypass circuits** are incorporated into the *HELP System* to protect your equipment and insure that the motor remains uninterrupted and in constant operation.
 - **The first bypass circuit** protects your equipment from **abnormal power conditions** such as “Single-phase” events. This protection shuts down your equipment in the event of this abnormal power supply. This shutdown will protect your system from any damage until the power supply is reestablished.
 - **The second bypass circuit** insures that your equipment **remains in operation** even in the event of an abnormal system occurrence. This bypass will revert equipment to the same mode of operation before installation of the *HELP System*. This will assure that your HVAC or other equipment will continue to operate no matter what has occurred.
- The **Patented Smart Microprocessor/Algorithm** technology is similar to that being currently used in premium HVAC systems offered by many major manufacturers. However, the *HELP System* does not require replacing or modifying any of your existing equipment.
- The *HELP System* is the only **Local and Retrofit motor control system** available today that does not replace any existing motors or other components. Local control allows for greater performance and response to varying conditions. The *HELP System* can also be used on many brands of equipment, regardless of manufacturer. **No other comparative retrofit equipment** is available.

IDEAL HELP SYSTEM APPLICATIONS

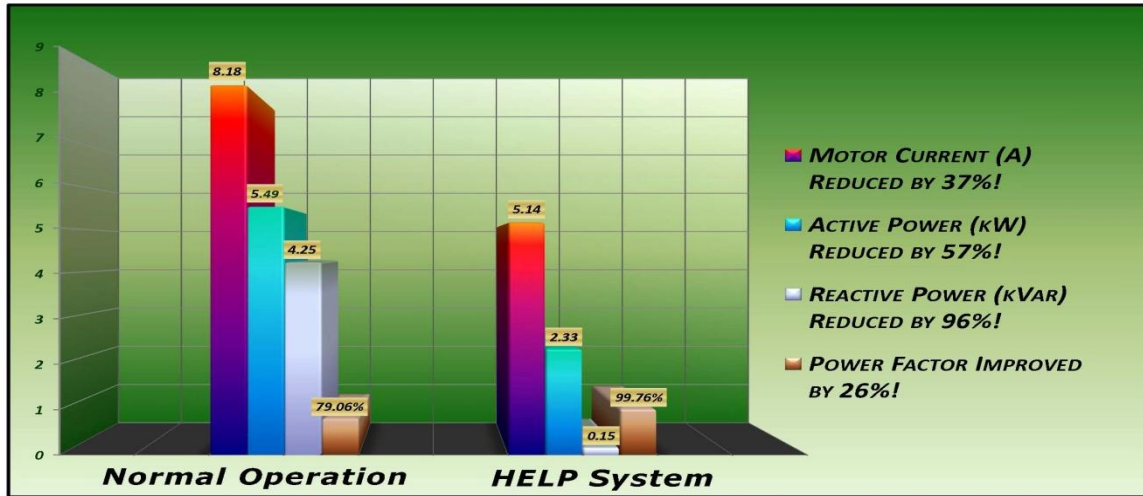
Ideal HVAC and other applications for the *HELP System*:

- ◆ **Air-Handler Blower Fans (VAV Systems),**
- ◆ **Chiller Pumps**
- ◆ **Cooling Tower Primary and Secondary Pumps**
- ◆ **HVAC & HVAC-R Compressors**
- ◆ **Cooling Tower Fans**
- ◆ **Boiler Feed-Water Pumps,**
- ◆ **Any 3-phase motor with a varying load.**

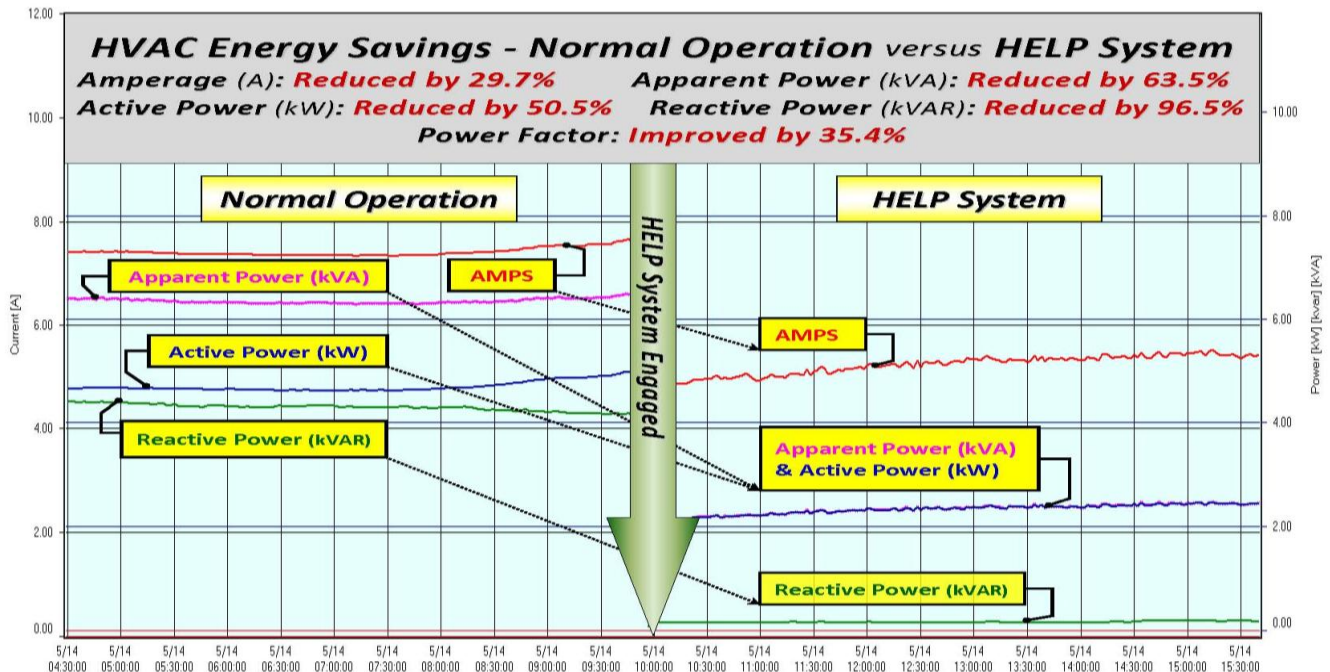
Ready Technology for Immediate Savings ...

CERTIFIED HELP SYSTEM TESTING

Actual *HELP System* Testing:



Certified test conducted on *Carrier 10-Ton HVAC* equipment



Certified test conducted on *Trane 10-Ton HVAC* equipment in constant operation

This test proves that the *HELP System* provided immediate and significant energy reductions during warmer, afternoon conditions. Power conditioning of the *HELP System* is proven by the combining of the Apparent and Active Power readings, as well as substantial overall consumption readings. The temperature and stability of the conditioned space actually improved during *HELP System* operation!

Typical ROI of ~24 Months...