

To whom it may concern,

I am currently seeking a qualified global partner to manufacture, market, and distribute within an \$18 Billion dollar market, my line of patented magnetically-coupled variable speed drives. This technology, developed through ongoing R&D, has become the industry standard for magnetically coupled variable speed drives with a proven track record of exemplary performance in a wide variety of applications. Where other variable speed drive technologies have proven to be either problematic or unsuitable, my variable speed drives have become the "real deal" solution to speed control needs of industry.

I have multiple patents for this technology in both foreign and domestic markets. The countries covered by patents include the U.S., Canada, Mexico, Europe, Australia, China, and Brazil. My company, Coyote Electronics, is presently licensed to manufacture the patented products. However, our geographical location inhibits our ability to produce them in the scale dictated by the market. With the current high cost of energy, the time for global introduction could not be better.

This new technology not only fulfills some obvious market needs, it will also open new markets where application requirements prohibit alternative technologies. And best of all, the simple and efficient design of these products is well suited for mass production on a very large scale with exceptional profit margins.

Take time to visit my web site at www.payback.com and feel free to view examples of installations of the patented variable speed drives in various applications.

I have included with this letter, an attachment that briefly summarizes the differences and many advantages of my patented technology versus other variable speed drive methods. This document also includes a summary of my company's capabilities.

If you have an interest in licensing the technology or would simply be interested in investing in a "proven" winner, please feel free to contact me at your convenience.

Sincerely,



Dewey Boggs
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VARIABLE SPEED DRIVE COMPARISONS Magnetic Coupled -vs- Variable Frequency

My company, Coyote Electronics, Inc., located in Fort Worth, Texas and established in 1983, began manufacturing our first generation of patented magnetic coupled drives in 1993 and now offers both belt and direct coupled versions in sizes from 1/3hp up to 200hp. The Coyote magnetic coupled drive technology is protected under numerous domestic and foreign patents including the U.S., Canada, Mexico, China, Brazil, Australia and Europe.

A condensed history of the eddy current drive technology can be found on the company's web site: www.payback.com. Please feel free to browse the site for more information on what we have accomplished up to this point. Coyote Electronics, Inc. takes great pride in being the recognized leader in introducing new and exciting alternative drive technology. We will soon introduce more models and sizes that are presently under development or in field beta testing.

I would first like to tell you a little bit about the evolution of the Coyote drive, the reason for its development and the key differences between the Coyote magnetic coupled technology and the electronic drive technology typically referred to as "Variable Frequency Drives" or "VFD's", (also known as "AC Inverters" or "Adjustable Frequency Drives").

Today, VFD's are the most commonly known method of speed control and are manufactured by numerous companies world wide. There are a few major players that comprise the bulk of the industry's supply, such as: Danfoss, ABB, Toshiba, Eaton, Robicon, Fuji, Siemens, and Yaskawa. However, the applications of these VFD's do come with some engineering issues that have never been fully resolved.

Unlike VFD's and older eddy current drives, Coyote magnetic coupled drives are a totally different animal (pardon the pun). The Coyotes were developed per customer request for an alternative to problematic existing speed control methods. ***The primary goal was to eliminate motor and power quality problems that are caused by the application of VFD's.***

The first objective was to employ a more reliable and less complex variable speed control methodology that could be easily maintained while using any existing AC motor, without the concerns typically associated with VFD technology (motor winding failure, bearing damage, audibly induced high frequency noise and power line disturbances). Another objective was to provide a drive with the highest achievable efficiency in a magnetic eddy current coupling and to reduce the size, weight and complexity of the technology in a simple, shaft mounted design. Yet another objective was to provide commonality in low cost replacement parts, regardless of horsepower. Yet another objective was to incorporate a simple low cost method of bypass to engage the load in case of any unforeseen emergency. The PATENTED Coyote PAYBACK® variable speed drives are the accomplished result.

The Coyote design has fewer parts than any other variable speed drive technology (fewer parts mean fewer problems). The Coyote is used for energy saving speed control of variable torque loads (i.e.: fans, pumps, and cooling towers) as an ultra reliable alternative to VFD's. Coyote variable speed drives are selected for use in critical and demanding applications, especially where low maintenance and low service cost are important, where maintaining good power quality is a requirement, or when there is concern for parts availability 10 or 20 years down the road. Because of these reasons, it is desirable and common for Coyote drives to be specified in hospitals, airports, universities, commercial and government facilities. Coyote drives are now being introduced with great acceptance into new market segments, including machine tool, waste water, mining, oil field and gas field. *These new models of self-powered drives can be utilized in areas where there is no electrical power available and where VFD's cannot operate.*

The Coyote has been in use in thousands of applications throughout the U.S. and Canada since 1993 with a superior track record. Many air handler unit manufacturers (OEMS) now install Coyote drives directly in their units and then ship the unit to the end user on engineered specified jobs. Engineered Air®, for example, a very high quality custom unit manufacturer, has considerable experience and confidence with the Coyote technology and has been specifying and using Coyote drive systems successfully for many years.

An inverter duty motor is never required with a Coyote variable speed drive since it has no adverse effects on the motor. This is because the motor is still connected directly to the pure uninterrupted A.C. power source when a Coyote magnetically coupled drive is installed. VFD's on the other hand are connected between the power source and the motor and therefore must be matched to inverter duty motors with spike protected windings and must include inductive filters to help reduce the possibility of motor bearing and winding damage.

Unlike the VFD, the Coyote drive actually increases the life expectancy of the motor, as the motor operates more efficiently and runs cooler without added stress on the windings.

With a Coyote drive, the speed of the fan or pump can be reduced to its lowest speed point continuously without causing any damage to the motor, since the motor load is reduced while the motor is still operating at its most efficient speed. Any additional heating is designed to be dissipated effectively by the drive and not the motor. This is not the case with a VFD.

A VFD causes additional heating in the motor and the VFD itself, reducing the life expectancy of the motor. That is why the Coyote technology can make the following guarantee that VFD's cannot:

"The PAYBACK magnetic-coupled variable speed drive will never cause electrically induced damage to the motor windings or bearings and will never distort power to the motor."

All Coyote drives are designed to be rated well under the overhung load capacity of the motor shaft. All major motor manufacturers endorse the application of the Coyote drive for use with their motors (Letters available on request). In fact, motor manufacturers offer the full extent of the standard motor warranty when their motors are used with a Coyote drive (unlike when motors are used with VFD's, whereby de-rating or reduction of motor warranty is typically required).

In critical applications, VFD's typically *require* the added expense of bypass contactors for the simple reason that the VFD must have an across the line back up when it fails. Unlike a VFD, a Coyote drive does not require an expensive bypass contactor. The motor is already running with a standard motor starter in the real Coyote-safe-motor-world. If for some reason the signal from the remote BMS is bad or loses connection, the Coyote controller can be easily switched to the manual mode, whereby infinitely adjustable speed control is accomplished via the manual adjustment (standard feature). In the even more remote event that the drive becomes magnetically decoupled from the load for any reason, the drive has a simple, built-in mechanical lock up feature that is standard with all Coyote drives (two simple lockup bolts couple the drive's rotating components for full speed operation - another standard feature).

Many of the fail safe features that VFD's have incorporated into their systems are intended to protect not only the motor, but the VFD itself, since the complex circuitry is more susceptible to power line disturbances, common glitches, and brownouts. Additionally, since the VFD directly feeds power to the motor windings, much of the VFD motor protection circuitry is required because the VFD can create these same negative conditions to the motor if there is an electrical event or a fault occurring in the VFD. (Additional motor protection is never a requirement as a direct result of the installation of a Coyote drive system, because unlike the VFD, the Coyote drive cannot damage the motor windings).

One of the most attractive features of the Coyote drive system is the inherent simplicity of the totally installed system. The Coyote system has been so successful because of this reason, following the basic KISS principle, keeping it simple.

The Coyote drive system is industry compatible with any building management system (BMS), and is also very simple to control and monitor via industry standard analog signal connections (0-10vdc, 4-20mA, etc.). The drive is also particularly well matched to work directly with the Engineered Air® C-Trac® controller system.

Since the drive is a simple magnetic coupling, it is totally isolated from the power source and therefore there are no provisions to interface with the motor incoming power. If real-time power monitoring of the motor is required, it can be done separately as an option with the Coyote system. The Coyote system can also include under voltage, over voltage and phase loss protection modules for the motor, if so required by the user.

Unlike VFD's, the Coyote drive can operate just about anywhere and at any distance from the drive's power source without de-rating. Unlike VFD's, there is no concern for "reflected wave voltage ring up" or electrical damage to the motor or drive because of any VFD related distance issues between the drive and controller. Unlike VFD's, the Coyote drive never requires special VFD wire cabling. Unlike VFD's, the Coyote drive is isolated from the power source and therefore does not care what the operating power supply source voltage is. The same Coyote drive that is used with low voltage motors can be used with high voltage motors and is also safer to operate and service in high voltage power situations.

Another misleading myth that is perpetuated by the VFD proponents is in the area of power factor. Go to <http://www.lmphotronics.com> for a third party reality check. Click on the chapter "Power Factor Correction". Read the article and then go to the section on inverters.

Most VFD companies tell you that their VFD's are rated at 95% power factor, but in reality, all standard VFD's, with the normal additions of the harmonic currents they produce, have true power factor that is typically in the 70% power factor range. To correct power factor in a VFD, filters must be installed to reduce the harmonics to acceptable levels.

Further, they fail to tell you that the Coyote magnetically coupled drive actually has better power factor in the operating upper half portion of the fan curve (where most of the fan applications are actually operating) than does an unfiltered VFD. A VFD cannot be easily or safely corrected with power factor correction capacitors. You can however safely and easily use power factor correction capacitors with any A.C. motor when using the Coyote drive to improve power factor just as you would with any fixed speed AC motor.

Regarding belt drive applications, the Coyote drive, which uses electromagnetic technology, is a less costly alternative to permanent magnet style eddy current designs because it does not require assembly and the shaft mounted Coyote PAYBACK® drive is supplied with an integral pulley. (The closest competitor's permanent magnet design would require a third party to devise a jackshaft and pulley arrangement to fit up between the motor and driven equipment). Coyote shaft mounted drives are available in both belt drive versions and direct coupled versions, as a complete and simple component that mounts directly to the motor shaft and is available in ranges from 1/3 hp to 200 hp. Plans for foot mounted enclosed models will extend the product range to 1000 HP and beyond.

Unlike the VFD, where the electronic package generally has many sizes throughout the entire hp range and spare parts inventory becomes an issue, ALL Coyote PAYBACK® drives use the same spare parts for ALL drive horsepower sizes, effectively reducing inventory requirements: (a user field replaceable plug-in circuit board and electric rotary coupler).

Once the VFD user has experienced a history of high repair costs and service charges for VFDS (typically from \$1000 and up per event as routine example for even small sized installations), the decision to switch to an alternative technology where the total spare parts cost for multiple Coyote drives are much less than a single VFD service call, becomes obvious.

These Coyote low cost "off-the-shelf" items will always be readily available for years to come. In contrast, based on past history, the VFD manufacturer is forced to change its design every couple of years or so to remain competitive, and consequently the VFD end user may frequently find himself with obsolete VFD's and obsolete VFD replacement parts.

Frequently, the Coyote is installed as a reliable replacement for VFD's that have died or have proven to be either too costly for the end user to maintain or too complicated to service or repair. Over the last 12 years, our customers have requested that we replace many different brands of VFD's, including many of the brands mentioned previously in this letter.

One of the most important questions that one could ask: "Are these Coyote drives reliable?" The short answer may be to ask the very first Coyote user this question. The first generation of 40 plus Coyote drives were field installed in 1993 in new air-handlers as part of the State of Texas Capitol expansion in the main Capitol Rotunda and House of Representatives offices in Austin Texas. Twelve years later, all of these Coyote drives are still operating 24/7, including the Coyote drive that runs the governor's office: first Ann Richards, then George W. Bush, now Rick Perry. Based on the history so far, I expect these Coyote's should last well beyond a few more hopeful politicians.

Regarding operating efficiencies, energy savings and real payback, an official third party source, Pacific Northwest Labs, under the Federal Energy Management Program for the U.S. Dept of Energy, recently did a test comparison between the Coyote "PAYBACK®" belt drive model, a VFD, and another magnetic coupled drive design. This test was titled "Technology demonstration of Magnetically-Coupled Adjustable Speed Drive Systems". The results of the 50HP test showed that out of all of the variable speed drive technologies submitted for testing, the Coyote "PAYBACK" drive provided the fastest simple payback based on overall energy savings, purchase cost, and installation cost.

Attached is an article written recently titled "New Motors and Drives Challenge Specifiers". It addresses some of the issues that are still facing VFD (AC Inverter)* users today, such as:

- switching speeds
- drive to motor lead length
- motor and cable impedance
- reflected pulses
- insulation damage
- audible noise and subharmonics

*Note that the above issues are uniquely common to all VFD's (Variable Frequency Drives) but they are not relevant with the Coyote PAYBACK® technology.

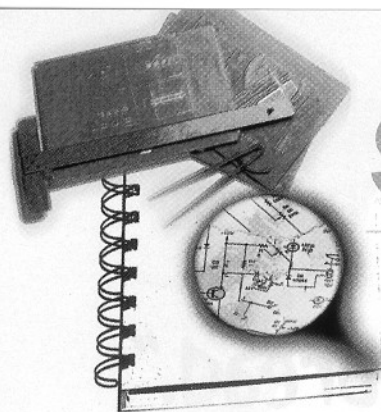
There are hundreds of these articles written over the years that indicate these same concerns when applying VFD's to A.C. motors, and I thought it would be appropriate to include this one with my letter.

I hope that the information provided is helpful and informative, and if you have any questions about the magnetic coupled technology discussed here, please do not hesitate to contact me directly. I look forward to hearing from you.

Sincerely,

A handwritten signature in blue ink that reads "Paul D. Boggs, III". The signature is fluid and cursive, with a long horizontal line extending to the right.

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Specifier's Notebook

COMMENTARY

NEW MOTORS AND DRIVES CHALLENGE SPECIFIERS

By C. C. SULLIVAN
Editorial Director

A E Why is it that every time building systems and devices get better, they also get harder to work with? This phenomenon might be termed "The Immutable Law of Specification": No labor-saving device or improved design comes without a commensurate amount of additional labor or end-user training. Alternatively, this just might be the category of cliché that most folks paraphrase as, "No good deed goes unpunished."

Case in point: Thanks to improvements in **motor and drive technologies**, engineers have more to worry about. Motor/drive operation has become more complex, and the reliability of fan- and pump-drive systems for heating, ventilation and air-conditioning (HVAC) systems can be compromised by misapplied variable-frequency drives.

While buildings and their HVAC installations are becoming more efficient, designers must take care to build reliable and safe electrical installations. Some of the critical issues to pay attention to are:

- **Switching speeds.** With switching frequencies pushing the outside of the envelope in many applications, engineers are developing ways to reliably control motors. Many designers have been using insulated-gate bipolar transistors (**IGBTs**) for pulse-width modulation (**PWM**) for the better part of a decade.

IGBTs FOR PWM

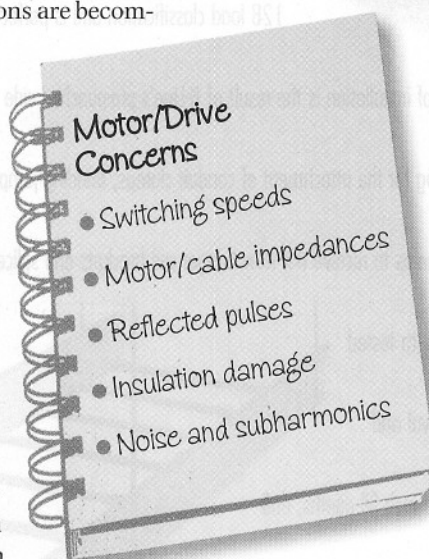
When using IGBT-based drives to accommodate greater switching speeds, application variables such as drive-to-motor lead length have become subject to increased scrutiny. Also, to keep motors stable, the ratio of "on" time to "off" time must be closely maintained.

- **Motor and cable impedance.** Savvy electrical engineers make sure that the motor's resistance is close in value to that of the lead cabling. If motor impedance is higher—which is almost always the case for small motors—the voltage pulse will be reflected at the motor terminals. **Reflected pulses** can cause an increase in voltage levels as standing waves interact with transmitted pulses. This may lead to ...

- **Insulation damage.** Depending on the materials used to insulate the system, the increased voltages can cause significant damage to the motors by means of the partial-discharge effect, also known as corona. Two factors—the dv/dt of the drives being used and the cable distance—should be considered in calculating the voltage-withstand level.

The manufacturer should include information such as maximum voltage-withstand values with their general specifications. As a rule, look for ratings in the range of 1,000 volts (V) to 1,800V for 208V motors and 460V motors, and peak values of up to 2,000V for motors on 575V feeds.

- **Noise and harmonics.** While some designers may use IGBTs to optimize the carrier frequency and thereby reduce audible noise, this approach can lead to undesired subharmonics. The resulting vibrations can match stator frequencies, causing major sound pressures. Other problematic effects of high carrier frequencies include decreased power throughput and increased requirements for heat sinks.



UNITING MOTORS AND CONTROLS

In spite of the challenges that come with newer and theoretically better control strategies for variable-speed systems, there are a few product enhancements that actually simplify the designer's job.

Perhaps the most talked-about trend of late is the **integrated drive/motor**. Clearly, integrated products should eliminate any problems related to lead length, as the inverter and motor share the

same box or mount. Other potential benefits include reduced installation costs, more flexibility under certain circumstances and space saved at the control panel.

The units, however, can be more expensive, and their benefit for less experienced specifiers—preventing incompatibility problems—isn't an issue for most electrical consultants.

The beauty of integrated motor/drive products, however, is that they protect against the vagaries of **PWM** current from AC inverters. And any time a reflected pulse can be suppressed, a variable-speed installation is liberated.

Coyote Electronics, Inc. PAYBACK® Patented Drive Designs, Applications, Capabilities

"Indy" PAYBACK® inductive belt drive



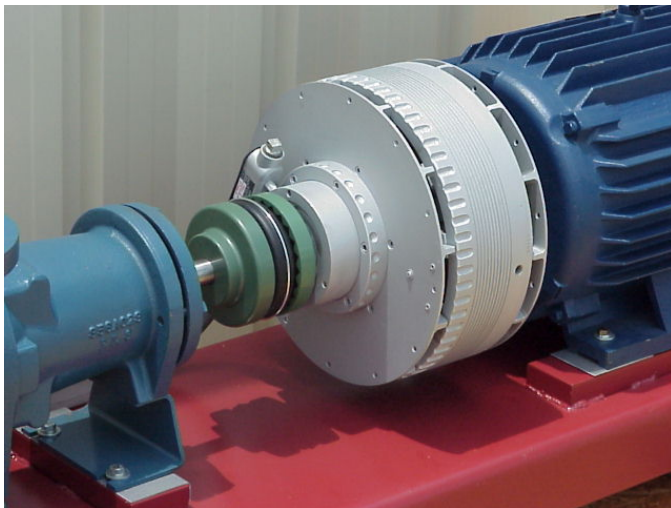
"Easy" PAYBACK® brushless belt drive



"Pro" PAYBACK® inductive direct coupled drive



"Smart Pulley" PAYBACK® self-powered drive



40 HP "Pro" PAYBACK® direct coupled, in-line VSD for chilled water pump, Canada



75 HP "Easy" PAYBACK® belt driven VSD for university in central Florida

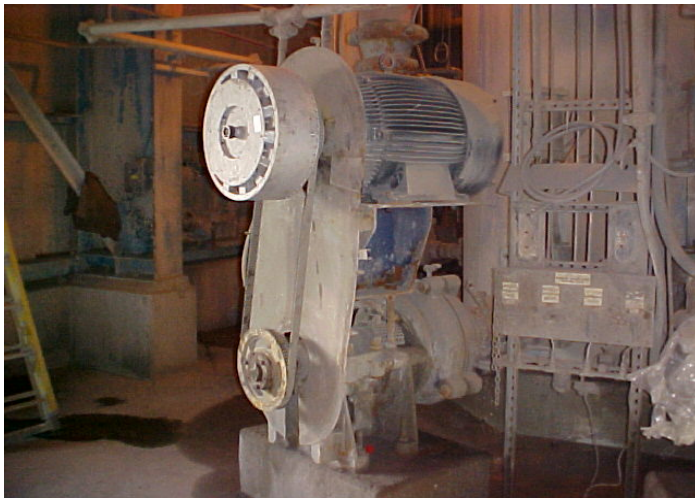
150 HP Easy PAYBACK®VSD chilled water pump.
Houston International Airport



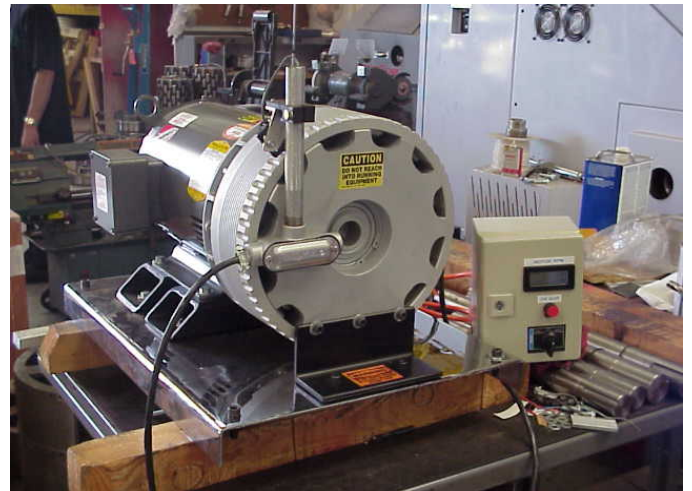
125hp "Pro" PAYBACK® direct coupled VSD
Soda Ash Plant, Colorado



125 HP VSD Slurry Pump, Mining application, Canada



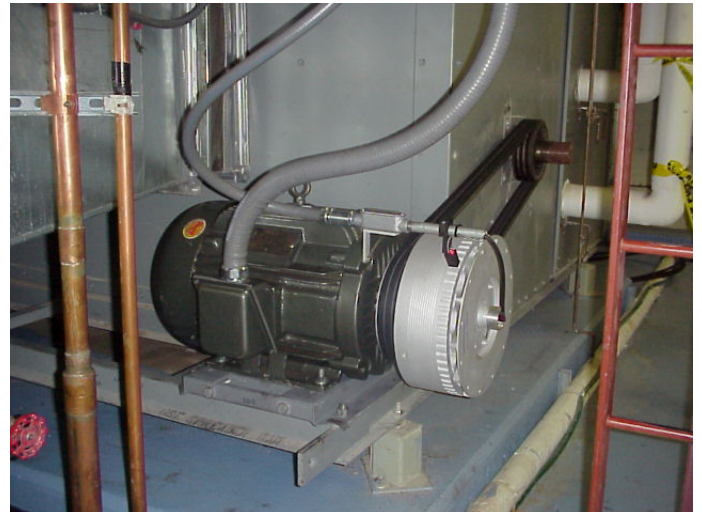
DYNO Test stand for Motor/Electronic Soft Starters



75 HP "Easy" PAYBACK® VSD Punch Press, Alabama



30 HP "Easy" VSD Air Handler, FAA Houston, Texas



200 HP Dual "Easy" PAYBACK VSDS for Air Handler, MD Anderson Hospital, Houston, Texas



< 1000HP Gas Engine Driven remote Gas Compressor application with jackshaft mounted 50 HP "Smart Pulley" (Self-Powered) for automatic variable speed control of the unit's main cooling fan, Alberta, Canada

40 HP "Easy" PAYBACK® Variable Speed Belt Drive for Woods Fan, factory installed, Dallas, Texas



One of many Engineered Air® rooftop AHU's with factory installed Coyote Electronics, Inc.'s "Easy" PAYBACK® variable speed drives at Hospital in North Richland Hills, Texas





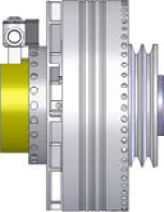
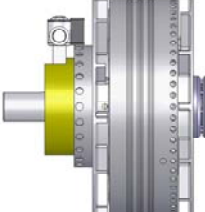
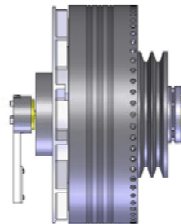
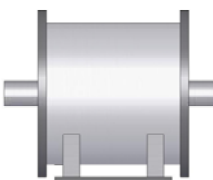
75HP typical motor and jack-shaft assembly used for Waste Water Pump retrofit conversion to a magnetic-coupled variable speed control, Dallas, Texas



This simple belt drive arrangement is a reliable method of converting the existing fixed speed equipment to variable speed. Jack-shaft alignment and belt tensioning are independently adjustable.



PRODUCTS

		HP RANGE	MOUNTING		APPLICATIONS			POWER		FEATURES/ NOTES
			SHAFT MOUNT	FOOT MOUNT	HVAC	INDUSTRIAL	CONTROLS SUITABLE FOR CLASS 1, DIV 2	SYSTEM	DRIVE	
"EASY" BELT DRIVE		1/3 - 200	✓		✓			110 VAC	0-48 VDC	A low cost belt drive that utilizes a brushless rotary power coupling unit to couple D. C. power to the drive's rotating coil.
"INDY" BELT DRIVE INDUCTIVE		3 - 200	✓			✓		110 VAC	0-100 VAC	A high performance heavy duty belt drive design that utilizes a patented rotary inductive design to transfer power to the drive coil.
"PRO" DRIVE DIRECT-COUPLED		3 - 200	✓			✓		110 VAC	0-100 VAC	A direct-coupled version of the rotary inductive design that fits the drive in-line between the motor and the load and is connected to the load by a standard flexible coupling.
"SMART PULLEY" * BELT DRIVE		3 - 200	✓			✓	✓	24 VDC	PWM @ 20mA	A belt drive that has an integral generator for the drive's power source. Requires only 20 mA of excitation current at any HP.
"COYOTE UGLY" ** SELF-POWERED DRIVE		40 - 1000		✓		✓	✓	NO EXTERNAL ELECTRICAL POWER REQUIRED		A totally self powered shaft in / shaft out design available as a foot mount or motor face design for heavy duty vertical or horizontal applications.

* In field beta testing ** In development