

MagnaDrive Canadian Distributor  
POWER PLANT SUPPLY CO

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MagnaDrive™

# Saving Energy



***The Next  
Industrial  
Revolution  
is Here!!!***

For sizing & pricing in Canada:  
<mailto:atlantic@powerplantsupplyco.com>  
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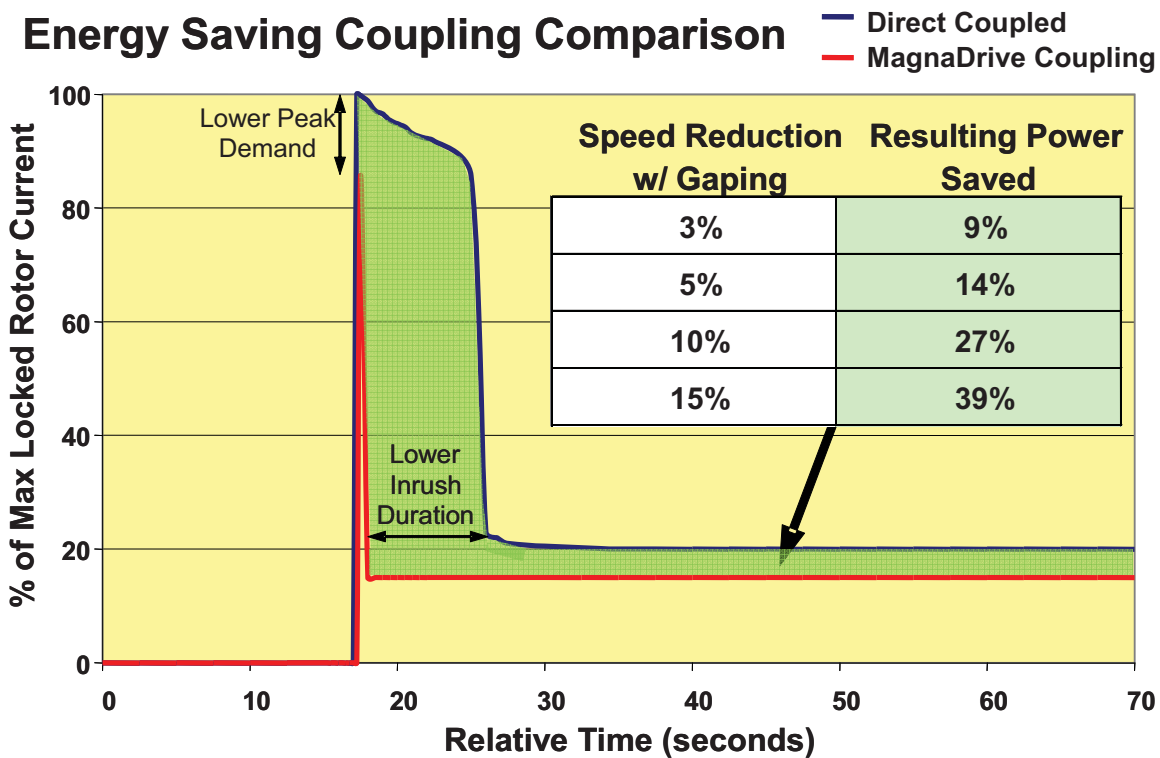


# MagnaDrive Products Save Energy!!!

## With the Affinity Laws

ASDs save energy on pumps, fans, and other centrifugal equipment by controlling process speed by automatically increasing the drive's air gap, and drawing from the motor the reduced power required by the centrifugal application. The speed of MagnaDrive constant speed couplings can be adjusted ("fine tuned") with gapping to achieve a limited range of process control, thus providing the same energy savings on pumps and fans.

It is known that most pumps, fans, blowers, and other similar centrifugal equipment installed worldwide are commonly oversized by 10%-15% or higher. No engineer wants to run the risk of under-sizing equipment. That's why most valves and dampers on a pump or fan are always partially closed. In effect, this is like running your car with one foot on the gas pedal and the other on the brake. A great deal of energy is wasted!!! If a system is oversized, flow must be reduced to reach the optimum operating capacity. In addition to closing a valve or damper, some operators create a bypass system where the excess flow is returned to circulation. This is inefficient and consumes more energy than necessary. Another way to reduce flow is to trim the impeller on the pump or fan, which is expensive and is a permanent change to the system. VFDs (Variable Frequency Drives) are yet another option to reduce speed. This is also an expensive proposition especially if the system is run at a constant speed most of the time.

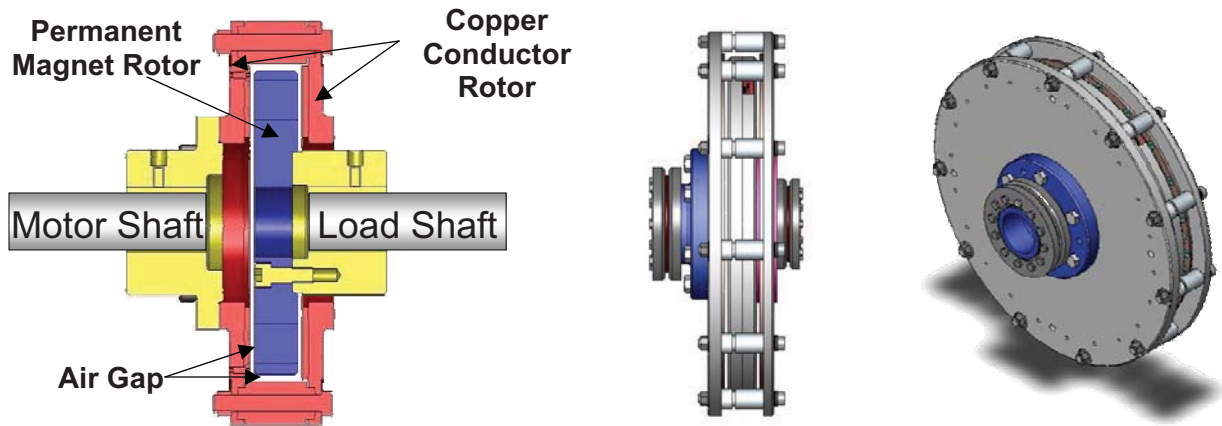


MagnaDrive couplings can be adjusted (depending on the application) to reduce costly power wasted by an oversized system, thus maximizing system efficiency. The resulting savings in power can be substantial. As the above graph illustrates, a 3% reduction in speed by adjusting the gap can result in a reduction in power consumption of approximately 9%. A 5% reduction in speed can result in 14% savings in power and so forth. Consult MagnaDrive for proper gap adjustment settings based on your application.

MagnaDrive couplings are the only couplings that can be adjusted to meet the exact performance demands of a system and give customers energy savings as a byproduct. Additionally, the air gap can be returned to the minimum position if additional flow is required. If desired, the air gap on a MagnaDrive coupling can be changed during certain seasons to accommodate higher flow rates required during other times of the year (i.e. winter vs. summer).

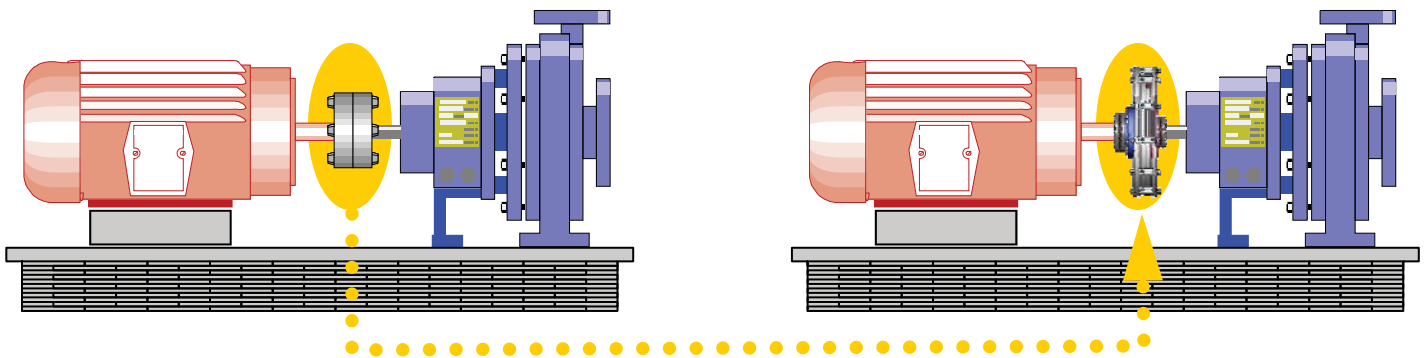
## With a Cushioned Start

All MagnaDrive Product's have a "disconnected connection" and realize the benefit of a cushioned start with lower peak demand and lower inrush duration, as per the graph on the opposite page. At startup, the motor must overcome only the inertia of the motor and the MagnaDrive Conductor Rotor, but not the Magnet Rotor, the shaft or the load. With many on-off cycles this energy savings can be substantial, as well as a reduction in reduced equipment wear (which in turn helps maintain equipment efficiency). Reducing peak demand may also reduce the power usage rate assessed by the utility company.



## With a Disconnected Connection

All MagnaDrive products can save energy by releasing the stress and friction in the system due to misalignment, thermal expansion and vibration. The MagnaDrive air gap accommodates some misalignment and system thermal growth. The motor wastes no energy deforming the shaft or adding load to bearings and seals. Energy lost due to friction in traditional couplings and in bearings, seals and other rotating equipment is minimized because the MagnaDrive air gap prevents vibration transfer.



Vibration and misalignment between motor and load cause bearings, seals, and other components to fail prematurely increasing energy usage.

Misalignment causes energy waste as the motor needs to work harder to overcome losses.

Thermal growth causes misalignment and energy waste due to increased friction between bearings.

Less vibration and no misalignment problems between motor and load increases bearing, seals, and other component life keeping system efficient.

Virtually no energy is wasted due to misalignment.

Thermal growth is accommodated in the system due to the air gap.



# Recent Energy Savings Examples



## HVAC

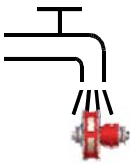


18% Energy Savings!!!\*

- ◆ **End-User:** Mirage Casino, Las Vegas, NV
- ◆ **Application:** Water Pump, Chiller #3
- ◆ **Product:** MGE-11
- ◆ **Motor Data:** 25 Hp / 1200 RPM



Energy savings was about 18% without affecting the process requirements. ROI Performed By Mirage. ROI Based on 5 couplings. Actual kWh Savings  $24/7/240 = \$9,976$ . Total cost of coupling upgrades for the Chillers = \$ 9,500. Annual ROI = 105%. Payback in years = 0.95. The ROI does not show the estimated \$5,000 bi-annual savings on pump rebuilds. \*Energy savings data provided by customer and specific to each application.



## Water & Wastewater

58% Energy Savings!!!\*

- ◆ **End-User:** Synagro Technologies, Inc., Baltimore, MD
- ◆ **Application:** Thermal Oil Pump
- ◆ **Product:** MGE-15
- ◆ **Motor Data:** 100 Hp / 1800 RPM



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MGE-15 was bought for maintenance reduction. Severe vibration and pump rebuilds were eliminated after the MGE was installed. Also, preliminary data shows significant energy savings. With the original coupling the motor current reading was 102 AMPS, and after the MGE-15 coupling was installed the reading dropped down to 43 AMPS. \*Energy savings data provided by customer and specific to each application.



# HVAC



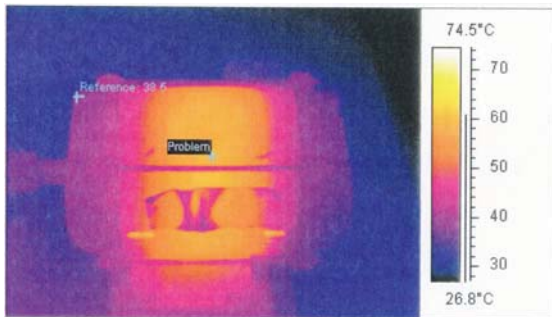
- ◆ **End-User:** US Army, Ft. Wainwright, AK
- ◆ **Application:** Heating System Pump
- ◆ **Product:** MGE-07
- ◆ **Motor Data:** 15 Hp / 1800 RPM

**20-27% Energy Savings!!!\***

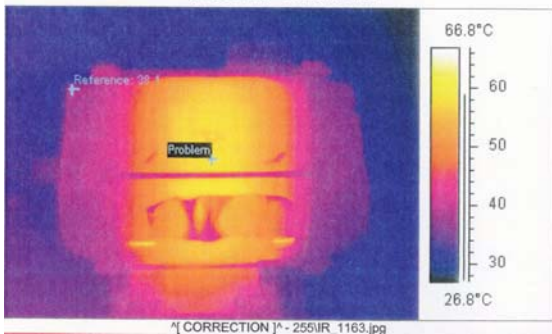


**Old Coupling**

27% energy savings after coupling was installed. Before Modification – 11kW energy usage on pump using flexible coupling (photo on the right). After installation – 8 kW energy usage on pump. Most of the energy savings is from eliminating misalignment and vibration. Also a small 2.2% reduction in speed accounted for additional energy savings. Coupling costs aprox. \$1,100. Pump is run 8 months out for the year. Therefore savings per year = 3 kW \* 24 hrs / day \* 243 days \* \$0 .145 per kW/h = \$2,537 savings per year. Payback = 0.41 months or 5 month payback in energy only. Additional savings in maintenance makes payback much shorter. \*Energy savings data provided by customer and specific to each application.



PROBLEM ]\* - 255\IR\_1158.jpg



CORRECTION ]\* - 255\IR\_1163.jpg

kW measured with Flexible Coupling			kW measured with MGE-01 Magnetic Coupling		
Flexible Coupling	App. Power	Real Power	MagnaDrive MGE	App. Power	Real Power
	kVA	kW		kVA	kW
Phase 1	1.354	1.058	Phase 1	1.208	0.836
Phase 2	1.444	1.170	Phase 2	1.311	0.948
Phase 3	1.443	1.123	Phase 3	1.310	0.900
<b>Avg/Total</b>	<b>4.241</b>	<b>3.350</b>	<b>Avg/Total</b>	<b>3.829</b>	<b>2.684</b>

A before and after electrical system analysis showed immediate reduced motor amperage and temperature upon installation. Infrared scans showed the temperature dropped by approximately 2 degrees Celsius with the MagnaDrive coupling installed, dropping the temperature out of the critical range.

In addition, vibration levels decreased by approximately 30% at four measurement points in the system.

Reading Location	Before	After
Pump Side (readings taken on pump)	64 db	51 db
Motor Side (readings taken on motor)	56 db	32 db
Pump Side (readings taken on front bolt)	43 db	31 db
Motor Side (readings taken on front bolt)	43 db	30 db

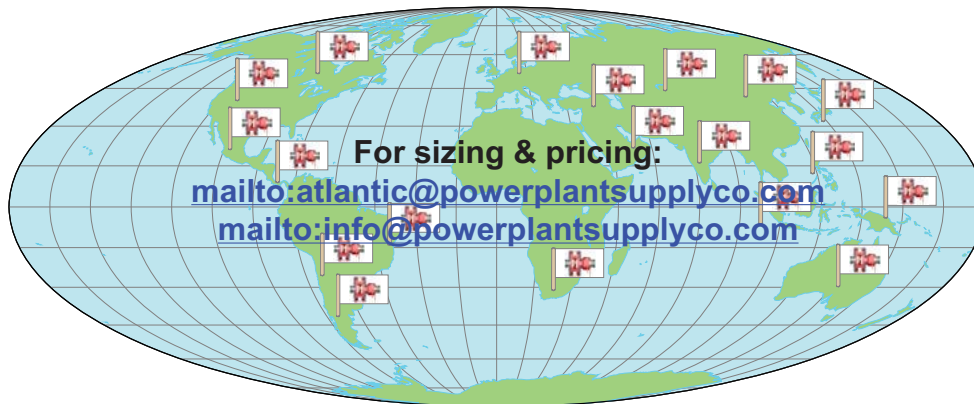
# MagnaDrive

C O R P O R A T I O N

## About MagnaDrive

MagnaDrive Corporation was founded in 1999, and is based out of Bellevue, WA. The company's breakthrough magnetic technology provides a cost effective solution to increase reliability and lower maintenance expense while achieving energy savings and process control. The impact and potential of the technology was recognized by Industry Week magazine, which selected MagnaDrive as Technology of the Year in 2001. MagnaDrive was selected by Inc. Magazine as one of the 500 fastest growing private companies in the United States. Recently, Deloitte named MagnaDrive one of the 100 fastest growing technology companies in North America. MagnaDrive offers a family of products to accomplish a broad range of operating objectives: Reliability, Speed Control, Torque Management, Cushioned Start, Vibration Control and Misalignment Tolerance.

## Worldwide Distribution and Service



MagnaDrive Corporation sells its products through an existing and rapidly expanding network of authorized sales and service Partners throughout the world. All MagnaDrive Partners are required to attend extensive training at the MagnaDrive University on sales, application, installation, operation, and service of our products. Consult us for information on the Partner closest to you.

## Training and Education



MagnaDrive offers all of its Partners, OEM's, Engineering Firms, and End-Users the opportunity to attend MagnaDrive University seminars which take place on a regular basis at our facilities in Bellevue, WA, USA. We are also available to conduct seminars on location at your facilities. Consult our web site for a schedule of seminars and information on how to sign-up.

Deloitte  
Technology Fast 100

Inc.  
500

IndustryWeek  
Technology of the Year



## MagnaDrive Corporation

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