# VARIABLE FREQUENCY DRIVES FEATURES AND BENEFITS

DEKKER Vmax$^{VFD}$ vacuum systems offer the most reliable and energy efficient systems today. DEKKER's advanced design combines the proven benefits of our Vmax oil-sealed liquid ring vacuum pumps with variable frequency drive (VFD) motor speed control. The vacuum systems are microprocessor controlled and offer substantial energy savings by automatically adjusting pump speed to match varying vacuum demand. This eliminates frequent stop-starts and results in more stable vacuum levels.

**Design Features**
VFD motor control lowers energy costs by adjusting speed to match varying vacuum demand. VFD "soft start" ramps motor speed gradually to extend system life, lower maintenance needs and reduce initial inrush current.

This new approach to energy-efficient vacuum systems allows simple, cost-effective expansion for customers who anticipate future building plans or increased demand.

Proprietary intelligent logic control monitors pumps and adjusts sequencing of multiplex systems as availability or demand changes.

DEKKER liquid ring vacuum pumps have only one moving part which results in cooler and quieter operation, high reliability, increased uptime, and lower maintenance costs.

Reliable for tough applications such as woodworking and soil remediation, the Vmax$^{VFD}$ is built to tolerate accidental carryover of liquids and soft solids.

**Benefits**
Control of power consumption — up to a 50% turndown in power, equates to energy savings.
Example: In a facility operating a 40 HP vacuum pump system with a VFD, let us assume the system would be running at a maximum load for only 50% of the time. The VFD would be in operation the rest of the time at a maximum turndown, resulting in reduced power consumption of 50%. A 40 HP vacuum system with VFD yields the following results:

**EXAMPLE: Two shifts at 8 hours each is 16 hours per day. With a 6 day work week we have 96 hours per week or 4,992 hours per year.**

| BEFORE A VFD | WITH A VFD |
|---|---|
| Using a normal across the line starting: Power cost = (HP/motor efficiency) x 0.746 x ($/kWh) x (hours per year) | 50% of the time the pump will be opperating on maximum load or 40 HP. Power cost is 50% of annual cost before VFD or $8,008. |
| Assuming a motor efficiency of 93% and a utility rate of $0.10 per kilowatt hour * | The other 50% of the time, using VFD, the pump would operate at 20 HP. Power cost = (20/0.93) x 0.746 x ($0.10) x 2,496 = $4,004 |
| Power cost = (40/0.93) x 0.746 x ($0.10) x 4,992 = **$16,017 annual cost.** | Total annual power cost using a VFD is $8,008 + $4,004 = **$12,012 annual cost.** |

**THE VFD SAVINGS: Power cost savings realized is $16,017 - $12,012 = $4,005 yearly.**

* Utility rate subject to change without notice.

DEKKER VACUUM TECHNOLOGIES, INC.

## VARIABLE FREQUENCY DRIVES FEATURES AND BENEFITS *(continued from page 1)*

Control of current inrush — Soft starting reduces wear on system components and eliminates current inrush during startup. When using conventional across-the-line starting, inrush current during startup will be 6 - 7 times motor running amps. Power companies analyze these spikes and their frequency and charge customers for these spikes. By using a VFD these spikes are eliminated by softly starting equipment.

Control of vacuum — Maintains vacuum level as leakage in the process increases.

Controls material damage and waste — Reduced slippage in hold-down applications results in less material damage and material waste.