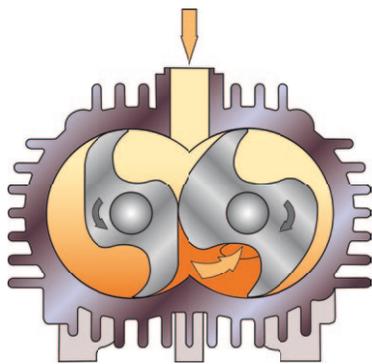


# Energy Savings with Busch Mink Vacuum Pumps

## Energy Savings Overview

Busch rotary claw vacuum pumps can reduce energy consumption by 25% or more,\* lowering electrical costs while also qualifying for custom energy rebates offered by many utility companies. With their unique, non-contacting, friction-free design, energy is not wasted from internal friction or drag like other pump designs. Additionally, when matched with PLC-based variable speed controls, energy efficiency is further enhanced, providing true on-demand operation.



## Operating Principle

Inside the pumping chamber, two “S” profile rotors driven by gears spin in opposite directions. As the rotors pass the inlet, a void is created and the trapped air is pushed to the exhaust side where it is first internally compressed and then discharged.

A small, fixed, gauged clearance is maintained between all moving parts. Due to this, there is no friction or wear and oil is not required in the compression chamber for lubrication, sealing or cooling.

## Vacuum Pumps

Mink series vacuum pumps are available in a variety of sizes and configurations to best suit your requirements. All pumps feature 100% oil-less compression, are air cooled, have TEFC motors and are suitable for variable speed operation.



- Pumping speed to 325 CFM
- Vacuum to 15 Torr (29.3" Hgv)



## Vacuum Systems

Busch Mink series vacuum systems are available in standard or custom configurations for industrial and laboratory applications.

Also available are a wide range of optional accessories and controls, including PLC-based variable speed controls that further enhance energy and maintenance savings.



## Vacuum Pump Comparison

Technical Data	Rotary claw dry-running	Rotary vane oil-lube	Rotary vane oil-less	Rotary screw oil-lube	Liquid-ring oil-sealed
ACFM	Very high	High	Medium-low	Medium	Medium
BHP	Low	Low	High	Medium	High
Efficiency	Very high	High	Medium-low	Medium	Medium
VFD* capability	Very high	Low	Low	Low	Low
Cost of ownership	Very low	Low	Very high	Medium-high	Medium-high

\*Variable frequency drive

## Energy Cost Comparison\*

Operating parameters	Rotary claw dry-running	Rotary vane oil-lube	Rotary vane oil-less	Rotary screw oil-lube	Liquid-ring oil-sealed
Motor HP	7.5	10	15	15	15
Run hours/year	8000	8000	8000	8000	8000
Motor efficiency	90%	90%	90%	90%	90%
\$/kWh	\$ 0.08	\$ 0.08	\$ 0.08	\$ 0.08	\$ 0.08
Total yearly cost**	\$ 3,977	\$ 5,303	\$ 7,954	\$ 7,954	\$ 7,954

\*Comparison of pump technologies to deliver 150 ACFM @ 150 Torr (24" HgV)

\*\* Yearly cost = (HP x .7457 x kWh cost)/Motor efficiency

## Variable Frequency Drive Energy Cost Savings

For applications with varying demand conditions, the use of a VFD (variable frequency drive) on a Mink rotary claw vacuum pump will result in additional energy cost savings (compared to a non-VFD equipped pump). This example represents a Busch MM 1252 AV model pump sized for an application with a maximum load condition of 150 ACFM @ 150 Torr (24" HgV), but with varying daily demand.

System demand	ACFM @ 150 Torr	Motor frequency	Brake horsepower	Operating hours	Yearly cost*
100%	150	58 Hz	6.8	800	\$ 361
75%	112.5	47 Hz	5.4	3200	\$ 1,145
50%	75	36 Hz	4.0	2400	\$ 636
25%	37.5	23 Hz	2.8	1600	\$ 297
Totals				8000	\$ 2,439

\*Based on \$0.08 kWh and 90% motor efficiency

