

# Vacuum Technology Comparison Chart



Characteristics	Contact-Less Claw	Liquid Ring – Water Sealed	Lubricated Rotary Vane	Oil Free Rotary Vane	Rotary Screw
Reliability When Maintained	Good	Good	Excellent	Moderate	Good
Longevity of Pump	Good	Excellent	Excellent	Moderate	Good
Operating Cost for 150 ACFM at 24 inHg	Low	High	Moderate	High	High
Altitude	Poor (1)	Good	No Limit	Poor (1)	Poor (1)
Maintenance	Low, Easy *	Low, Can be Complex	Moderate, Easy	Moderate, Easy	High, Can be Complex
Efficiency	Very High	Low	High	Moderate	Low
VFD Capability	Very High	Low	No	Low	Low
Advantages	<ul style="list-style-type: none"> <li>• Low operating cost</li> <li>• Excellent choice for dedicated anesthesia evacuation system</li> <li>• Low maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Pump life, ambient temperature indifferent</li> <li>• Excellent choice for a dedicated anesthesia system</li> </ul>	<ul style="list-style-type: none"> <li>• High vacuum</li> <li>• Long vane life</li> <li>• No water and sewage costs</li> <li>• Low noise level</li> <li>• Air cooled design</li> <li>• No rust and scale problems</li> <li>• Low operating cost</li> </ul>	<ul style="list-style-type: none"> <li>• Low maintenance</li> <li>• Low run temperature</li> </ul>	<ul style="list-style-type: none"> <li>• Good for high hp application</li> <li>• Enclosed unit</li> </ul>
Disadvantages	<ul style="list-style-type: none"> <li>• High initial cost</li> <li>• Higher noise level compared to other systems</li> <li>• Higher heat load or higher running temperature</li> </ul>	<ul style="list-style-type: none"> <li>• Dependence on a reliable supply of water</li> <li>• Good water quality is crucial to avoid premature failures due to scale build-up</li> </ul>	<ul style="list-style-type: none"> <li>• High maintenance</li> <li>• Unsuitable for a dedicated anesthesia evacuation system</li> <li>• Cannot take a slug of water</li> </ul>	<ul style="list-style-type: none"> <li>• Much shorter vane life than lubricated pumps</li> <li>• Lower capacity per horsepower than other designs</li> </ul>	<ul style="list-style-type: none"> <li>• Requires a large footprint</li> <li>• No customization allowed</li> </ul>
Sizing Error Tolerance	Good	Poor	Poor (2)	Good	Good
Suitability for Dedicated WAGD	Excellent (4)	Excellent	DO NOT USE	Poor (3)	DO NOT USE
Ambient Temperature	Limit of 100°F	No Limit if Water is Cool	Limit of 100°F	Limit of 100°F	Limit of 110°F
dB at 10 hp	83	76	76	81	89**
Top Vacuum	22 inHgV**	26 inHgV	29 inHgV	23 inHgV	29 inHgV
Manufacturer	Busch, Elmo Rietschle	Travaini	Becker, Busch, Elmo Rietschle	Becker, Busch	Quincy

\* Indicates the Pump is highly recommended where this characteristic is desired.

\*\* At 20 hp

(1) Pumps can be operated at higher elevations if a lower ultimate vacuum is accepted or life of vanes is reduced.

(2) Lubricated rotary vane machines may not easily tolerate being undersized.

(3) Oil free rotary vanes use graphite vanes which are not generally suitable with elevated oxidizer concentrations. Some manufacturers claim they can be rendered.

(4) In the O<sub>2</sub> assured version.