Electric versus Air-Driven Pressure Boosters

The table below compares specifications of air-driven and electrically-driven pressure boosters for two different cases: high pressure two-stage boosting and low pressure single-stage boosting. Air-driven boosters are inexpensive, compact and explosion-proof, but they can also be noisy and inefficient. Electric boosters on the other hand are larger, quieter, much more efficient, but have higher capital costs. The usage, type of application, availability of compressed air and space requirements will determine which pressure booster is a better fit. Please contact Midwest Pressure Systems to size a booster system for your specific application.

	Competitor's Two-Stage Booster	MPS Booster HL42-2500		MPS Booster 52AAV70	MPS Booster HH3040-600
Description	Air-driven 2-stage	Electric 2-stage		Air-driven single-stage	Electric single-stage
Supply pressure	75 psi	75 psi		80 psi	80 psi
Discharge pressure	2,500 psi	2,500 psi		500 psi	500 psi
Flowrate	67 SCFH	67 SCFH		270 SCFH	270 SCFH
Drive Air Pressure	90 psi	N/A		80 psi	N/A
Drive Air consumption	33 SCFM (8.2 HP)	N/A		35 SCFM (8.7 HP)	N/A
Power consumption	N/A	1.5 HP		N/A	3.0 HP
Electricity consumption	6.1 kW	1.1 kW		6.5 kW	2.2 kW
Power cost for 1,000 hours at $0.13 per kWh	$793	$143		$845	$286
Seal Life	1,000 hours	10,000+ hours		4,000 hours	10,000 hours
Capital Cost	~$7,000	~$16,000		~$5,000	~$16,000

Two-Stage Analysis:
The two-stage application highlights the disadvantages of an air-driven compressor for high discharge pressures and high boost ratios. Seal life is much shorter, air consumption is high and efficiency is much lower compared to the electrically-driven unit. However, the capital cost is low so for infrequent usage requirements, explosion-proof requirements or confined spaces the air-driven unit may be more attractive where sufficient drive air is available. For frequent usage the low energy consumption, long seal life and lack of shop air requirements offset the higher capital costs (within less than a year of operation for some applications) of an electric booster.

Two-Stage Application Example:
Pressurizing industrial gas cylinders with nitrogen from a membrane or PSA generator.

Single-Stage Analysis:
Single stage boosters are much closer in seal life and power consumption compared to a two-stage booster. The air-driven unit has 40% of the seal life and 3 times the energy consumption of the electric unit, however the capital cost of the air-driven unit is significantly less than an electric booster. The air-driven unit is likely to be more attractive in situations where sufficient drive air is available and usage is intermittent. The electric unit is more efficient and has longer seal life so for some applications it remains the better choice. If there is insufficient drive air for an air-driven unit, the electric unit is the only choice.

Two-Stage Application Example:
Pressure testing application using standard shop air at 80 psi to produce test air at 500 psi.

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