

Which Screen Printer Should You Choose? Pneumatic, Servo Motor, or Fully Electric?

The Development History of Screen Printing Machines

■ 1. Early Development: pneumatic flat screen printer

- * Early traditional screen printing machines generally used pneumatic flat screen printers. The advantage of this type of machine is its low cost. Therefore, during an era that emphasized large-scale, mass production, many brands adopted this type of screen printing machine.

■ 2. Technological Advancement: Application of Variable-Speed Motors and Servo Motors

- * As time progressed and the demand for technological products increased, traditional pneumatic flat screen printers began to be gradually phased out. The ink scraping drive systems started to use variable-speed motors. In further development, especially in the printing of glass panels, light guide plates, and other precision objects, more and more machines started to use servo motors for the ink scraping action.
- * The advantage of servo motors lies in their digital control and stable operation. Especially when printing on transparent materials, servo motors can provide even, stable, and controllable effects, improving print quality.

■ 3. The Popularization of Servo Motors

- * Ten years ago, Fine Cause introduced affordable servo ink scraping screen printing machines. By mass-producing components to reduce costs, servo ink scraping technology is no longer exclusive to high-tech applications, gradually spreading to general industrial and consumer goods screen printing. This technology's popularization has made quality control in screen printing easier, significantly improving the print quality of these products.

■ 4. The Rise of Fully Electric Screen Printing Machines

- * In recent years, with the widespread adoption of industrial digital control technology, fully electric screen printing machines have gradually gained the favor of the market. Compared with traditional pneumatic flat screen printers, electric systems operate more stably and delicately, aligning with the current energy-saving and carbon-reduction trends.
- * Compared to cylinder systems that require air compressors, air tanks, and refrigerant dryers for complex air pressure conversions, electric systems can avoid the energy losses associated with multiple energy conversions. In addition, the pressure loss of pneumatic systems is much greater than that of voltage loss, making fully electric screen printing machines more efficient in energy use.

■ 5. Future Development Directions

- * To meet broader market demands and respond to energy-saving trends, Fine Cause will launch tabletop fully electric simplified models and high-end fully electric models, covering both pad printing and screen printing product lines. The company will continuously improve, remain practical, and be professional, ensuring that FINE CAUSE will be your best choice in the pad printing and screen printing fields!



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Energy Consumption Comparison Table of Three Screen Printing Machines

Model	Machine Drive Type	Control Ability of Printing Quality	Energy Consumption	Unit Price
TCN Pneumatic Flat Screen Printer	Relies solely on pneumatic power; electricity is only used for control	Low	High	Low
TSN Servo Screen Printer	Servo used for critical squeegee movement, others still use pneumatic	Medium	Medium	Medium
TZN All-Electric Screen Printer	Every movement is driven by servo and stepper motors	High	Low	High

Annual Electricity Savings of the Three Screen Printing Machines

Model	Air Compressor Power (W)	Freeze Dryer Power (W)	Total Power Consumption (W)	Hourly Power Consumption (kWh)	Daily Power Consumption (kWh)	Monthly Power Consumption (kWh)	Annual Power Consumption (kWh)	Energy Ratio	Saved Electricity
FA-400TCN	2238	600	2838	2.838	22.704	499.488	5993.856	100%	0%
FA-400TSN	1692	400	2092	2.092	16.736	368.192	4418.304	73.71%	26.29%
FA-400TZN	X	X	575	0.575	4.6	101.2	1214.4	20.26%	79.74%



Power Consumption Calculation

FA-400TCN calculated with a 3-horsepower air compressor: $3 * 746W = 2238W$

FA-400TSN calculated with a 2-horsepower air compressor: $2 * 746W = 1492W + 200W$ (half for the motor)

Assuming 8 hours of work per day, approximately 22 working days per month, and around 264 working days per year (excluding weekends and holidays).

The power consumption of the three models within the same time frame is as follows.

1 kWh = 1,000 watt-hours (1,000 Wh) = 1 kilowatt-hour (1 kWh)

Annual power consumption of pneumatic flat screen printer = 5993.856 kWh

Annual power consumption of servo screen printing machine = 4418.304 kWh

Annual power consumption of fully electric servo screen printing machine = 1214.4 kWh

If comparing the **fully electric servo screen printing machine** with the **pneumatic flat screen printer**, using these values in the formula:

Percentage saved = $1214.4 \div 5993.856 = 0.2026$

Percentage saved = $(1 - 0.2026) \times 100 = 79.74\%$

Therefore, the **FA-400TZN fully electric servo screen printing machine** saves approximately **79.74%** of the electricity compared to the FA-400TCN pneumatic flat screen printer.

Meanwhile, the **FA-400TSN servo screen printing machine** also saves about **26.29%** of the electricity compared to the FA-400TCN pneumatic flat screen printer.



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Which Screen Printing Machine Should You Choose?

The fully electric screen printing machine does not require pneumatic systems, does not use cylinders, and can be operated just by plugging it in without an air supply. Not relying on pneumatic systems eliminates the potential impact of air pressure fluctuations on print quality, providing more stable printing performance. A general semi-automatic screen printing machine requires a pneumatic system, **which is the biggest difference. No need for air pressure means more energy savings!**

Fully electric screen printing machines provide higher print quality. Thanks to their digital control and servo systems, they can achieve more accurate position control and more stable printing pressure. The downward pressure of the squeegee is controlled by a stepper motor, which allows fine adjustments to the pressure distance, making it ideal for high-end screen printing. This is something that general semi-automatic screen printing machines do not offer.

Fully electric servo screen printing machines may be more expensive initially, but you won't need to spend extra on an air compressor. You can operate it simply by plugging it in. Moreover, in the long run, the savings on electricity costs will be substantial! If you have large printing volumes and demand precision and quality, the **FA-400TZN fully electric servo screen printing machine** is the best choice!

If budget is a concern, you can opt for the **FA-400TSN servo screen printing machine**, a standard mass production model, which also excels in accuracy and print quality!

FINE CAUSE Energy-Saving and Environmental Protection Label



Fine Cause manufactures pad printer and screen printer including standard types and customization. We manufacture a variety of ink cup pad printer, open-tray pad printer, servo motor screen printer, pneumatic cylinder screen printer and customized screen printer.

In the past decade, we have taken part in an extent of customized and precise machinery projects on both pad printing and screen printing including a variety of application fields: printer for plastics, printer for metals, printer for glass, plastic surface printer, metal surface printer, glass surface printer, coin printer, auto-cylindrical bottle printer, SD card printer, MICRO SD card printer, contact lens printer, syringe printer, test tube printer, solder paste printer and touch glass printer, etc.

Our service

- ▶ Pad Printer
- ▶ Screen Printer
- ▶ Hot Stamping Machine
- ▶ Other Equipments
- ▶ Printing Supplies
- ▶ Inks/Solvents/Additives
- ▶ Printing Pad Catalog
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