



## Pneumatic vs. all-electric labeling: safety first

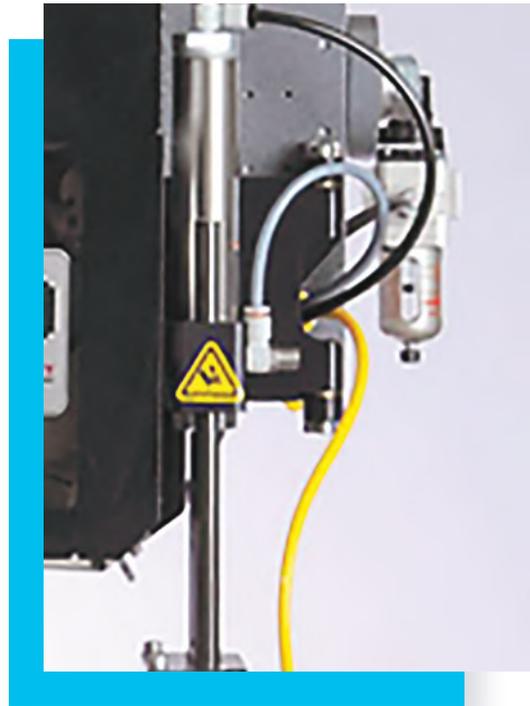
When industrial labeling applicators were first designed, there was a focus on using pressurized air to actuate the labeling arm into movement. Pressurized air was readily available and provided quick bursts of movement. As the industry and technologies have modernized, other power sources are now available to improve control and safety.

### MODERNIZATION

Precision sensors, servo motors and power supplies have modernized pneumatic systems of the past and increased safety and reliability with failsafe design. This design ensures the system will stop all movement in the event of a localized or decentralized power failure. Sensors used in Diagraph's PA7100 all-electric print and apply labeling machines are considered smart because they provide feedback to the system that the operation of the system is unbothered. If a sensor fails, the machine will revert to safe mode.



## PRINT & APPLY LABELING SYSTEMS



## SMART SENSORS

There are several benefits to the control gained by smart sensors.

### ALL-ELECTRIC

When the tamp pad of an all-electric labeler approaches the package, the auto-retract sensor determines the proximity of the package and then automatically retracts back to the home position. This allows each package to receive the same controlled tamp pressure regardless of imperfect product handling or package height variation.

If the auto-retract sensor detects any obstruction in its path, the tamp movement ends and the actuator retracts.

### PNEUMATIC

Pneumatic actuators receive a quick and forceful burst of air that forces a high impact on the product.

The pneumatic cylinder is designed to return to the home position once it has reached the end of its stroke or if the pressure is too high, regardless of what package or object is in its path. To lower the impact on your package, you must place it at the end of the stroke. This does not take variation of package placement into account so you must put the package in the way of the stroke to receive forceful tamping. There is no built-in protection for personnel who may get in the path.

## DURATION AND DISTANCE SETTING

Programmable duration and stroke distance are two additional methods that the Diagraph PA7100 all-electric print and apply labeling machine uses to control label placement.

### ALL-ELECTRIC

Duration is measured by the electronic system, reducing potential risks. A system error will occur if the tamp does not return home within the pre-programmed duration. Distance is measured by the return signal from the servo motor which controls the tamp movement. As a failsafe, the distance can be programmed to just beyond the surface of the package to be labeled. In situations where the system is actuated and no package is present, the tamp distance will stop at the programmed distance.

### PNEUMATIC

A pneumatic system cannot sense how far it is traveling until the end of the stroke. The tamp extends far beyond the desired stroke length if no package is present during application, leading to potential safety risks. As a workaround, the pneumatic air cylinder must be adjusted to meet the package surface at the very end of the cylinder stroke. Each package height must be accommodated by a cylinder stroke adjustment.

## COMPARISON OF VOLTAGE REQUIREMENTS

Voltage requirements and exposure are top safety concerns in a plant environment.

It is important for safety reasons that all-electric print & apply labeling systems require low voltage (50 volts or less). Diagraph's PA7100 all-electric print & apply labeling system utilizes an off-the-shelf 24-volt power supply that is molded and sealed.

The Diagraph PA7100 all-electric print & apply labeling system uses plant voltage and converts this high voltage to low voltage in a commercially available and certified power supply located outside of the labeling system.

All pneumatic labeling systems require plant or high voltage. Some pneumatic systems even have high voltage exposure beyond accessible panels, increasing safety risks to employees and the facility.

## COMPARISON OF NOISE LEVELS

One overlooked area of concern around pneumatic systems is the noise levels generated by air control valve assemblies in actuation. OSHA recommends air pressures below 30psi for blowing compressed air in cleaning operations.

### ALL-ELECTRIC

The all-electric print & apply labeling equipment produces very minimal noise as no compressed plant air is used, thus reducing contributing noise pollution.

### PNEUMATIC

When air control valves vent air during actuations, the result is blowing air into the environment and generating noise. Pneumatic labeling equipment runs at much higher pressures than 30psi.

## COMPARISON OF EQUIPMENT INTEGRATION

A final point around the contrasting look between all-electric and pneumatic labeling systems is the ability to integrate the equipment into other manufacturing line equipment controls.

Electrical signals already exist in all-electric print & apply labeling equipment and simply need to be properly outputted and mapped to the required line system controls. Diagraph's PA7100 all-electric print & apply labeling equipment offers features such as I/O connections to accommodate the closed loop plantwide system control. Integration of manufacturing line equipment increases line uptime, reduces line congestion, provides the most efficient line production and offers the best means of safety.

Additional benefits of integration capabilities are the real-time production data available to the business owners and planners.

Pneumatic systems offer little electrical information that can be translated into usable PLC information and instructions.

Contact us today to discuss  
the best options for your operation.

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