AutoJet® TECHNOLOGIES

Improve Product Quality and Productivity with Precision Spray Control

A Division of *Spraying Systems Co.*®
Experts in Spray Technology

Spray Nozzles | Spray Control | Spray Analysis | Spray Fabrication

Standard Spray Solutions — Tested and Ready to Install

Save money and improve productivity with an optimized spray system

Self-contained AutoJet® Modular Spray Systems monitor, control and improve the performance of Spraying Systems Co. automatic spray nozzles. Proven in low flow rate spray applications, such as coating, cleaning and cooling, these systems provide quick payback by:

- **Saving chemicals and eliminating overspray**
- **Minimizing manual labor**
- **Improving product quality and reducing scrap**

Powerful spray solutions — configured easily, delivered fast

Modular Spray Systems are engineered from standard spray component kits. Design options can be specified on-site by you and your local sales engineer. Built at manufacturing locations around the world, your system can be delivered in a matter of days or weeks — not months. The systems are easy to install and operate and can be integrated with your current plant control platforms, so you'll be up and running quickly.

Just provide your sales engineer with some basic information about your application, and your system can be configured in three steps.

1

Select the right spray nozzle.

Based on decades of applications experience, we'll help you select the best spray nozzle for the job. Modular Spray Systems deliver the fastest possible response time from automatic spray nozzles. See the back cover for more information on automatic spray nozzles typically used with the systems.

29JAUCO Spray Nozzle

VMAU Spray Nozzle

2

Choose the right level of control for your production line.

From basic on/off control to fully-automated, closed-loop spray control, Modular Spray Systems provide the power of a fully-integrated system quickly and economically.

Systems equipped with AutoJet Spray Controllers feature powerful on-board application software that eliminates the need for on-site programming by your staff. These dedicated spray controllers can monitor and automatically adjust spray performance and can compensate for changes in conditions such as temperature and humidity that can affect the efficiency of your spraying system.

The control level is determined by answering two questions:

- Do you need specific timing to control the start and stop of the spray gun?
- Does liquid pressure or flow need to change automatically as a function of other process parameters?

3 Select a configuration.

For easy installation into your plant, AutoJet Modular Spray Systems are available as panel-mount units, mobile SprayCarts or fully-enclosed SprayDesk systems for maximum protection in rugged environments.

Stainless steel pressure tanks eliminate pump maintenance — the only thing you need to provide is a pressurized air source for systems with air atomizing or air-actuated nozzles. Spray nozzle hook-up kits are available for use with a wide variety of spray nozzles. Pump delivery systems are also available.

BASIC CONTROL

Manual
Valve Packages

Complete systems include nozzles, pressure tanks, valves and regulators. Components are enclosed in a single panel for easy wall mounting.
(See page 4.)

INTERMEDIATE CONTROL

Model 2050
Spray Controller

Onboard timing control is ideal for applications where spray variables are pre-set and only need to be monitored.
(See page 5.)

ADVANCED CONTROL

Model 2250
Spray Controller

Pre-programmed spray controller monitors and adjusts spray performance based on your process variables, such as conveyor speed, temperature and batch control.
(See page 6.)

Basic Spray Control

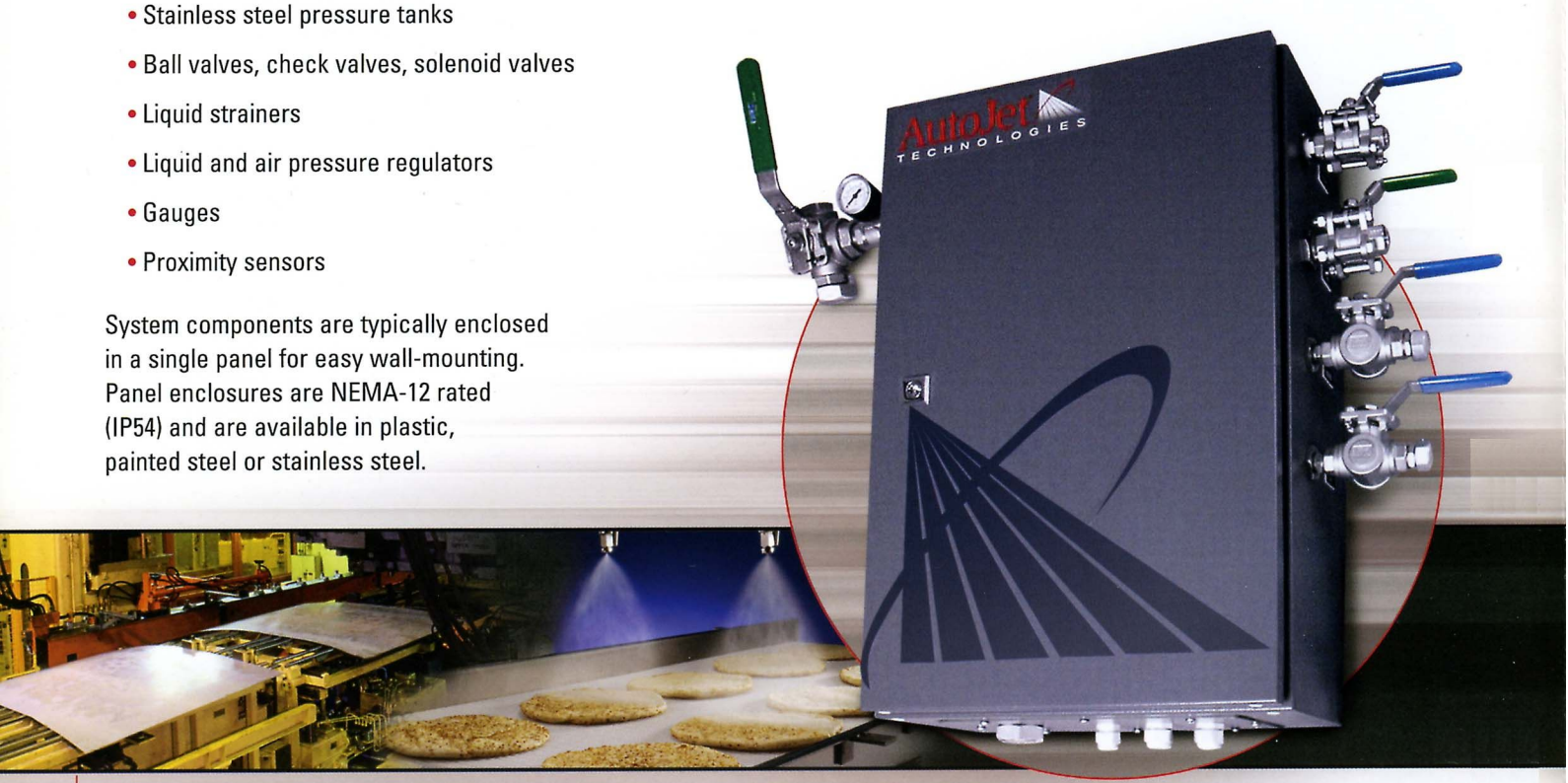
Save time and ensure consistent spray performance

Basic Modular Spray Systems with manual control packages eliminate the design, specification and installation processes that often overload in-house engineering and maintenance staff. Just provide operating requirements and your sales engineer will configure your Modular Spray System using standard spray component kits.

Systems typically include:

- Spray nozzles and hook-up kits
- Stainless steel pressure tanks
- Ball valves, check valves, solenoid valves
- Liquid strainers
- Liquid and air pressure regulators
- Gauges
- Proximity sensors

System components are typically enclosed in a single panel for easy wall-mounting. Panel enclosures are NEMA-12 rated (IP54) and are available in plastic, painted steel or stainless steel.



Typical Applications

Lubricating Metal Stampings

Problem: An automotive parts manufacturer needed a uniform coating of lubricant on a wide variety of metal stampings. They also wanted to reduce their oil consumption and eliminate misting.

Solution: An AutoJet Modular Spray System equipped with 1/4JAUMCO metering air atomizing nozzles sprays a fine mist of oil on the parts when triggered by a signal from the stamping press. Since installing this system, the customer has reduced oil consumption by 40%.

Oiling Bakery Products

Problem: A bakery equipment OEM needed a simple system to spray oil on baked goods as they move on a conveyor belt. It was important that the oil be applied evenly and that production not be interrupted to replenish the oil supply.

Solution: An AutoJet Modular Spray System was configured with five air atomizing nozzles activated by a proximity sensor. The oil is supplied from two pressure pots operating in parallel so that one is always operating and the spray process does not have to be interrupted to re-fill the tanks.

Intermediate Spray Control

Improve nozzle performance with real-time monitoring

AutoJet Modular Spray Systems equipped with Model 2050 Spray Controllers optimize the performance of Spraying Systems Co.'s automatic spray nozzles with powerful onboard timing control software.

Features include:

- **Ease of Operation**
  - Real-time monitoring of spray pressures
  - Simple set-up and adjustment of spray pressures and timing parameters
- **Advanced timing control**
  - Object detection sensors to supply start and stop trigger signals
  - On/off, delay parameters easily set; spray duration as low as one millisecond
  - Anticipator and follower functionality for air atomizing nozzles
- **Advanced Fault Sensing**
  - Program fault limits, alarms and shutdown conditions

AutoJet Modular Spray Systems with the Model 2050 Spray Controller are ideal for industrial spray applications where spray variables are pre-set and only need to be monitored.

Typical Applications

Coating Electronic Components

Problem: A process instrumentation manufacturer needed to spray a polymer solution on quartz crystals used in their process analyzers.

Solution: A Modular Spray System doses a precise "shot" of protective polymer coating onto a quartz crystal positioned on a rotating carousel. A signal from the carousel to the Model 2050 AutoJet Spray Controller activates the nozzles when the product indexes to the correct position. The volume of the protective coating can be manually adjusted by the operator for different crystal sizes and coatings, if necessary.

Browning Baked Goods

Problem: Workers at a bakery were manually applying water to the outside of fruit pies before baking to improve browning. This process was labor-intensive and inconsistent coverage resulted in high scrap rates.

Solution: A Modular Spray System equipped with a Model 2050 AutoJet Spray Controller accepts a signal from a proximity sensor and triggers three air atomizing nozzles. The controller maintains a consistent water spray on each pie, ensuring even browning without burning. Two workers have been re-assigned to other tasks within the bakery and the scrap rate has been reduced significantly, providing an estimated payback of under one year.

Advanced Spray Control

Industry-leading Precision Spray Control

AutoJet Modular Spray Systems with Model 2250 Spray Controllers provide real-time control of spray processes. Patented SprayLogic® software allows the controllers to accurately monitor and automatically adjust spray performance based on what's happening in your process. The Model 2250 Spray Controller can even monitor and compensate for external conditions that can critically affect the efficiency of your spraying system.

Features include:

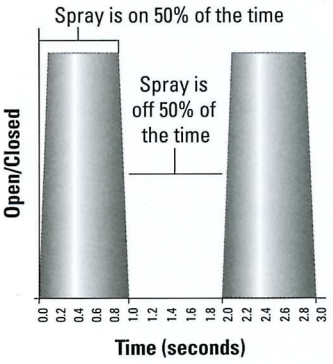
- **User-friendly interface**
  - System status is shown on an easy-to-read LCD display
  - Keypad with "smart keys" allows for easy menu navigation and data entry
- **Advanced timing control**
  - Object detection sensors can supply start and stop trigger signals
  - On/off, delay parameters easily set; spray duration as low as one millisecond
- **Advanced flow sensing and spray shaping**
  - Monitors liquid flow and other performance criteria with automatic shutdown on selected faults
  - Accurately detects nozzle wear and blockage — even partial plugging
  - Adapts flow rates and spray patterns to the shape of the product being sprayed with variable shape spray control algorithms
  - Improves system troubleshooting with intelligent fault messages
- **Open-loop or closed-loop spray control**
  - Optimizes spray performance with cascaded control loops and multiple PID regulation
  - Maintains constant flow rate or spray pressure
  - Maintains constant application rate on a variable speed conveyor
  - Maintains constant temperature when cooling gases or solids
  - Provides multiple combinations of pressure settings for convenient batch control

AutoJet Modular Spray Systems with the Model 2250 Spray Controller are ideal for spray applications where automatic adjustment is necessary with validated results.

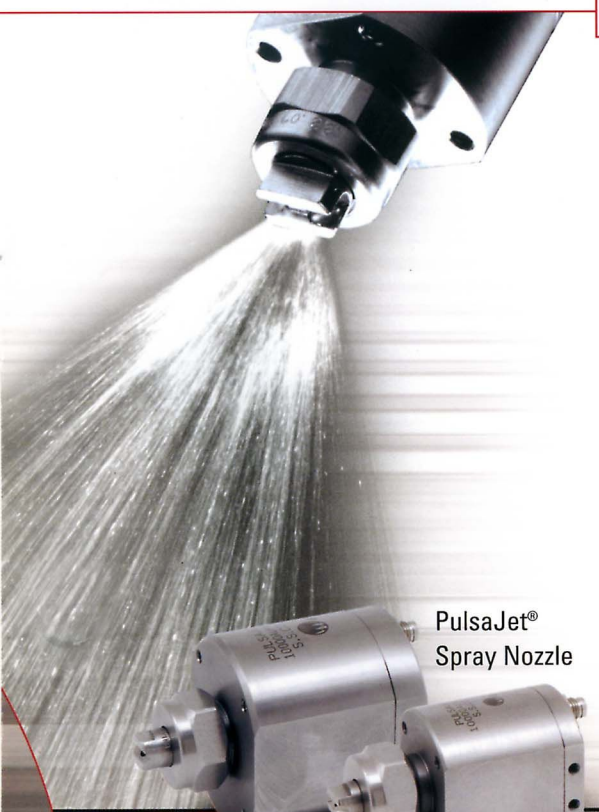
Pulse Width Modulated Flow Control

In pulse width modulated flow control, an electrically-actuated spray nozzle is cycled quickly at a controlled frequency.

The time from one nozzle "on" signal to the next "on" signal is called the period (shown as two seconds in the chart to the right). The percentage of the period that the nozzle is actually "on" is the duty cycle. If the gun is on half the time, the duty cycle is 50% and the flow will be 50% of the maximum flow rate at a given pressure for the nozzle.



Using the Model 2250 AutoJet Spray Controller to control the duty cycle, flow rate can be controlled very precisely. PWM also allows lower flow rates with clog-resistant larger spray tips, minimizes overspray and can reduce chemical consumption.



PulsaJet® Spray Nozzle

Extremely high flow turndown ratios — up to 10:1 or more — can be achieved at a single pressure using PWM. Finally, the Model 2250 AutoJet Spray Controller can also utilize a signal from a pressure transducer to automatically compensate for variable supply pressures by adjusting the duty cycle to maintain a constant flow rate.

Typical Applications

Spraying Antimicrobials

Problem: A leading meat processor uses an antimicrobial agent to extend the shelf life of its meat products. Activating the spray nozzles to hit the moving trays was difficult, and with variable line speeds, they were unable to apply a consistent coating on every meat tray on the conveyor. Product quality and overspray of the costly solution were major concerns.

Solution: An AutoJet Modular Spray System ensures that the correct amount of ascorbic acid is applied to the meat products every time despite varying line speed. The spray controller manages the timing of two automatic spray nozzles based on the speed of the conveyor. Optical sensors are used to detect the meat trays as they pass below the spray nozzles, eliminating overspray on the conveyor. The AutoJet Modular Spray System provides annual savings of more than $50,000 by reducing the consumption of ascorbic acid and the scrap caused by packaging problems.

Topical Coating of Tissue and Paper

Problem: A manufacturer of paper products needed to apply a perfume on tissue paper, paper towels and hygienic paper products without wetting the paper. Previous spray systems could not properly adjust the spray for varying line speeds and stained the product with excessive perfume.

Solution: An AutoJet Modular Spray System equipped with a Model 2250 AutoJet Spray Controller triggers automatic spray nozzles and automatically adjusts the flow rate based on line speed. The uniform perfume coverage provided by the Modular Spray System improved product quality, reduced scrap and decreased maintenance downtime.

Spraying Systems Co. Automatic Spray Nozzles

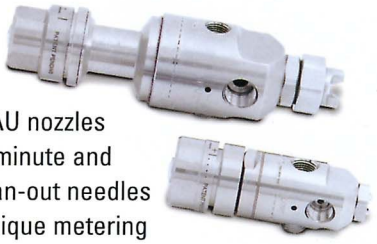
AutoJet Modular Spray Systems improve the performance of automatic spray nozzles

As a division of the world's leader in spray technology, AutoJet Technologies systems are fully compatible with Spraying Systems Co. air-actuated and electrically-actuated spray nozzles. These are the automatic spray nozzles most commonly used with AutoJet Modular Spray Systems:

PulsaJet® Automatic Spray Nozzles

Offer high speed cycling up to 10,000 cycles per minute. When used with a Model 2250 AutoJet Spray Controller, they can provide pulse width modulated flow control (see page 7 for more information). PulsaJet automatic spray nozzles can be equipped with hydraulic atomizing or air atomizing tips and are available with a variety of flow capacities.

JAU Automatic Air Atomizing Nozzles



Produce an extremely fine spray by mixing compressed air with liquid. The air-actuated JAU nozzles cycle up to 180 times per minute and can be equipped with clean-out needles to minimize clogging. A unique metering adjustment is available which provides precise, repeatable flow rate adjustments with a few simple clicks. The JAU family is well-suited for use with highly viscous liquids.

VMAU Variable Automatic Spray Nozzles

Feature independent control of liquid, atomizing air and fan air for fine tuning of spray capacity, droplet size, and spray patterns. This precise control improves the spray distribution uniformity and minimizes overspray. The modular design reduces maintenance downtime.

Model 22AUH Automatic Spray Nozzles

Provide intermittent liquid spray at any desired frequency up to 180 cycles per minute using only liquid pressure as the force for atomization. A variety of flat, hollow cone and full cone spray tips are available.

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