

# APPLICATION NOTE A014-ST02 - SPRAY DOSING

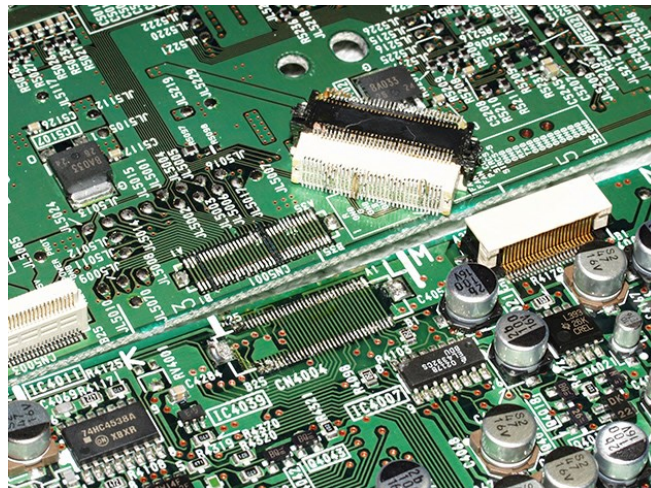
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## APPLICATION NOTE A014-ST02

### SPRAY DOSING

**Speed, reproducibility, stability, easy adjustability, is really a must for liquid dosing techniques like spraying. Bronkhorst fully understands these demands, and the value for the equipment manufacturer and end-user.**

Due to cost-savings, the production machines has to be more efficient. This results in increased speed of production lines and less waste of used materials. The need for faster and more accurate flow control became a must. Aware of this need, Bronkhorst has been developing the next generation mass flow sensors and controllers perfect for this job.



#### Application requirements

Most production machine integrators need high speed dosing and accurate flow control. Compact and reliable plug-and-play instruments with digital (bus) communication are required for easy integration on machines and low cost of ownership and the easy to service and less downtime.

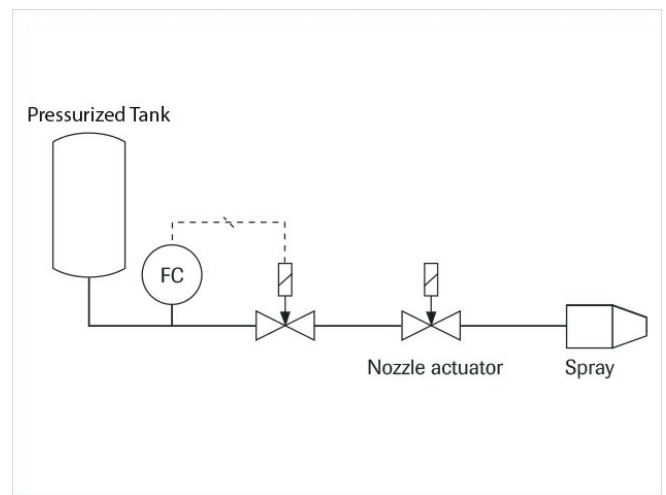
#### Important topics

- Fast and accurate control
  - Plug and play
  - High speed dosing
  - Service friendly
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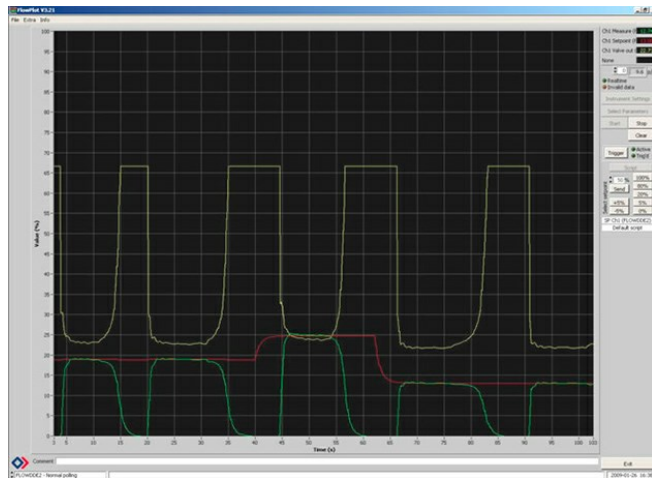
## Process solution

Surface treatment by spraying fluid is commonly used technique in the industry. For example to apply paint, glue or resins. Used technique can be very simple. A tank with a pressurised liquid supplies a spray nozzle with a fixed orifice. The disadvantage of this method is the lack of measuring the real applied mass and the lack of control and application inflexibility. For example a change in supply pressure is a change in spray dosing. A change in supply liquid is a change in sprayed pattern and amount. Also the variable speed of the production line is influencing the result.

These influences can be very critical for some applications. Different products or different treatments need a flexible machine. A solution for these demands can be an inline coriolis mass flow sensor which is independent from the applied fluid. To control the actual measured dosing spray a proportional controlled valve is placed in front of the spray nozzle actuator. The integrated digital electronics creates a fast control loop with sensor and the proportional valve. When the machine enables it's spray nozzle, the actual flow rate is been perfectly controlled, according to the electronic set value. Changes due to pressure drops or switched fluids or change in production speed will be immediately compensated. Perfectly and flexible controlled spray results in better product results. Cause of these features and the stand alone, plug-and-play solution, it creates a big advantage for system integrators.



Flow scheme



## Plotdata demonstrating fast control

**Red** = Setpoint

**Green** = measured value

**Yellow** = valve reaction

Discription: The machine control system sends a pre-setting flow setpoint to the (mini) CORI-FLOW. The control valve is opening to the max (yellow line). There is no flow because the spray nozzle is still closed. The machine control system enables the spray nozzle. The flow is increasing very fast (green line) and the control valve is reacting very fast to limit and control the flow accordingly the flow setpoint.

## Recommended Products



**MINI CORI-FLOW™ M14**

Min. flow 0,03...1 kg/h  
Max. flow 0,3...30 kg/h  
Pressure rating 200 bar  
Independent of fluid properties  
High accuracy, fast response



**MINI CORI-FLOW™ M15**

Min. flow 0,2...5 kg/h  
Max. flow 3...300 kg/h  
Pressure rating 100 bar  
Independent of fluid properties  
High accuracy, fast response



**CORI-FLOW™ M54**

Min. flow 0,2...5 kg/h  
Max. flow 5...100 kg/h  
Pressure rating 200 bar  
Independent of fluid properties  
High accuracy, fast response



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