

## LIQUID MIXING SYSTEMS

**In the past contact lenses manufacturers were required to manually prepare batches of 17,000 litres of cleaning fluid diluted into a saline solution which had to be refrigerated to maintain a shelf life of just 20 hours due to bacterial generation. As a result the manufacturing process had to be halted whilst freshly prepared batches were reinstalled.**

Thanks to Bronkhorst continuous proportional dosing systems we have considerably increased the production output and reduced manufacturing costs.



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### Application requirements

Contact lenses are complex biomaterials that must provide a range of physical properties in order to be effective, safe and comfortable to wear. These properties include: (1) high oxygen permeability in order to transmit Oxygen to the cornea, (2) hydrophilic surface so that a continuous tear film coats the lens providing lubrication and (3) resistance to bacterial and protein absorption.

### Important topics

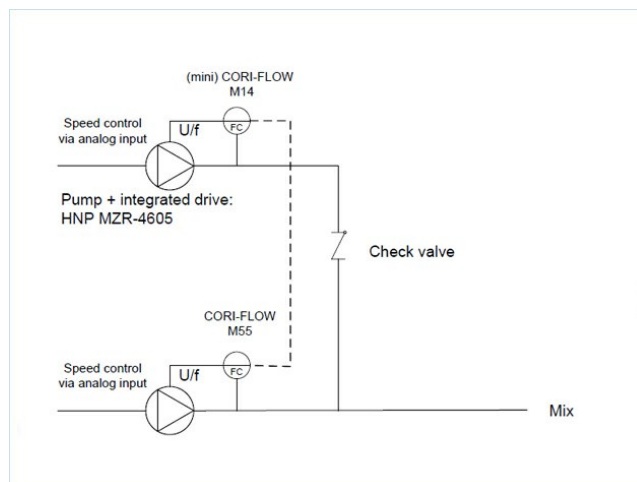
- High accuracy
  - Filters to protect gear pumps
  - Compact build-in system
  - Stable control
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## Process solution

The Coriolis Mass Flow Controllers primary function is the proportional dosing of cleaning fluid into a Saline solution using a Master / Slave principle. As a result of a variable main flow, the slave-instrument responds to the changed master output signal. By communicating directly via DeviceNet with the supervisory automation and control system the Master CORI-FLOW mass flow instrument is provided with the precise dosing requirements. The compact design of the Bronkhorst instruments, where the Coriolis meter and controlling Micro-annular pump are mounted in one compact unit, was a key factor in selecting the Bronkhorst solution.

The advantages of this continuous dosing process is the reduced floor space needed due to carboy 17,000 litre vessels both full of product and one end of the production process and empty at the other no longer being required. Further advantages were found in reduced cleaning fluid wastage due to the highly accurate Coriolis measurement principle. Many applications ask for compact, accurate measurement and control of additives to be proportionally dosed into a main flow. By using mini CORI-FLOW instruments it is easy to set up compact autonomous working systems that offer this functionality without the need of external computer hardware and software.

Of further interest were the extensive tests carried out to study the length of time that bacterial growth occurred within the Coriolis instruments and gear pumps. The customer required no bacteria growth between planned maintenance periods of 13 weeks. After 26 weeks of testing without bacterial generation the customer concluded no further testing was necessary.



Flow scheme

## Recommended Products



MINI CORI-FLOW™ M14V14I

Min. Bereich 0,03...1 kg/h  
Max. Bereich 0,3...30 kg/h  
Druckstufe 100 bar  
Medienunabhängig  
Hohe Genauigkeit, schnelle Messung



MINI CORI-FLOW™ M15

Min. Bereich 0,2...5 kg/h  
Max. Bereich 3...300 kg/h  
Druckstufe 100 bar  
Medienunabhängig  
Hohe Genauigkeit, schnelle Messung



CORI-FLOW™ M55

Min. Bereich 0,5...20 kg/h  
Max. Bereich 12...600 kg/h  
Druckstufe 100 bar  
Medienunabhängig  
Hohe Genauigkeit, schnelle Reaktion



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