

Liquid Mixing Systems



Application note A027-FP08-1216D



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.

- ◆ Cleaning fluid dosing machine
- ◆ Tabletisation
- ◆ Fragrances



Compact continuous dosing system

Application requirements

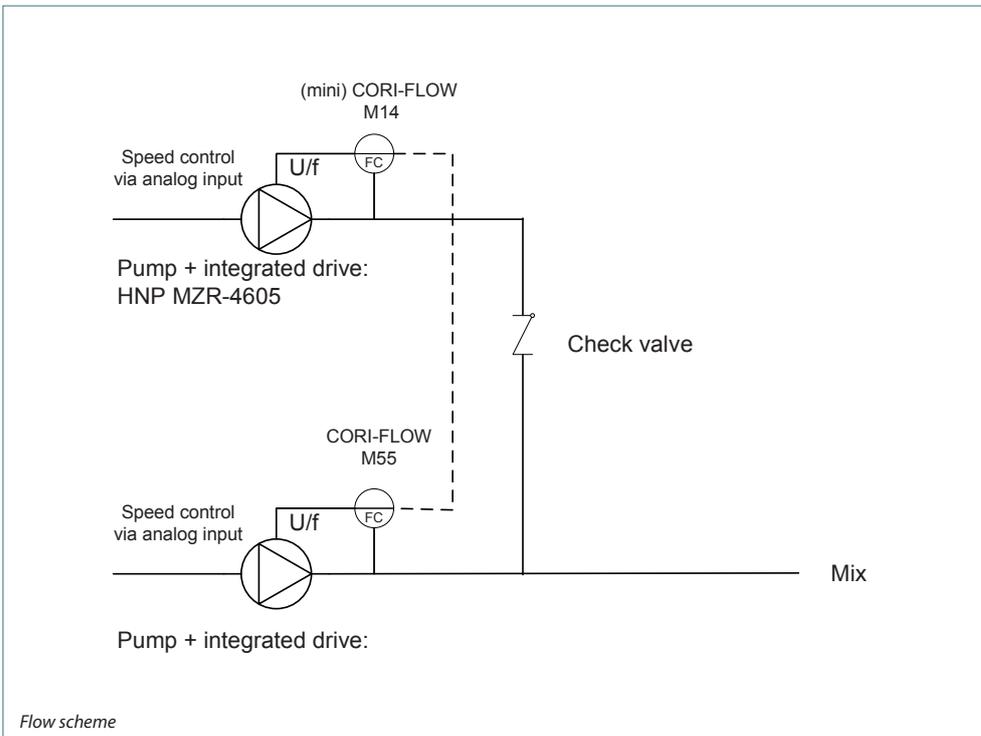
Contact lenses are complex biomaterials that must provide a range of physical properties in order to be effective, safe and comfortable to wear. These properties include: (1) high oxygen permeability in order to transmit Oxygen to

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

Process solution



Flow scheme

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 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. ■



Recommended Products



mini CORI-FLOW
mini CORI-FLOW M14 Coriolis flowmeter for ranges of 30 g/h...30 kg/h and additional density and temperature output; analog signals and RS232 are standard; fieldbus communication is optional (e.g. Profibus-DP, Modbus, DeviceNet, Flow-Bus).

- ◆ Accuracy: 0.2% reading +/- zero stability
- ◆ SS316L wetted parts, all metal
- ◆ No moving parts
- ◆ Temperature: 0...70 °C
- ◆ Alarm and totalizer facilities
- ◆ Fast response (up to 50 msec.)
- ◆ Easily re-rangeable for different flow rates
- ◆ Power: +15...24Vdc ; pressure: up to 200 bara
- ◆ IP65



CORI-FLOW
Coriolis flowmeter for ranges of 500 g/h...600 kg/h and additional density And temperature output; using integrated batch counter and directly controlling shut-off valve for dosage; analog signals and RS232 are standard; fieldbus communication is optional (e.g. Profibus-DP, Modbus, DeviceNet, Flow-Bus)

- ◆ Accuracy: 0.2% reading +/- zero stability
- ◆ SS316L wetted parts, all metal
- ◆ No moving parts
- ◆ Temperature: 0...70 °C (or higher)
- ◆ Alarm and totalizer facilities
- ◆ Fast response (up to 100 msec.)
- ◆ Easily re-rangeable for different flow rates
- ◆ Power: +15...24Vdc ; pressure: up to 100 bara
- ◆ IP65



HNP Mikrosysteme MZR-4605
Micro-annular pump
These ultra low-flow, miniature, positive displacement pumps are designed for precise, accurate, smooth, pulse-free pumping and dispensing of a wide variety of liquids. The compact size and low mass of the MZR pump/motor units ensure they can be incorporated into the designs of many systems.

- ◆ Accurate dispensing of volumes as small as 0.25 microlitres
- ◆ Low flow dosage in the micro litre range
- ◆ Pulseless delivery



Filters
Inherent to there construction Gears pumps are sensitive to particulates damaging the internal gears. To increase MTBF (Mean Time Between Failures) it is important to ensure that the fluid is free particulates.

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System
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FP: Food, Beverage and Pharma
08: Pharmaceutical

