

Pressure measurement for ultrafiltration systems

Application:

Cross-flow filtration system for the pharmaceutical industry



PASCAL CV pressure transmitter



A blood test measures protein levels. If any risk factors or pathologies are detected, protein-containing medicines can help in recovery. LABOM's contribution to quality protein extraction: its **PASCAL CV pressure transmitter** featuring a DN 10 inline diaphragm seal for cross-flow ultrafiltration systems.

A healthy improvement in quality ... In protein extraction, what really counts is the accuracy of the filtration systems.

Proteins are considered to be the most important components in the human body. They are extremely versatile molecules that have many functions, acting as catalysts in chemical reactions, enabling muscle contractions, transporting oxygen in red blood cells, regulating hormonal processes and serving as antibodies in combating infection. Proteins are added to medicines in order to treat diseases or minimize risk factors. In biotechnical pharmacy, proteins are extracted from organic cells, a process which destroys the cells. After these cells have been destroyed, the resulting mixture is separated by being sent through a cross-flow filtration system. The desirable proteins are caught in the filter, where they can be extracted. In development work for a major laboratory and process-technology supplier, which had developed a new filtration system for pharmaceutical companies, LABOM was able to significantly improve quality and efficiency by employing its PASCAL CV pressure transmitter.

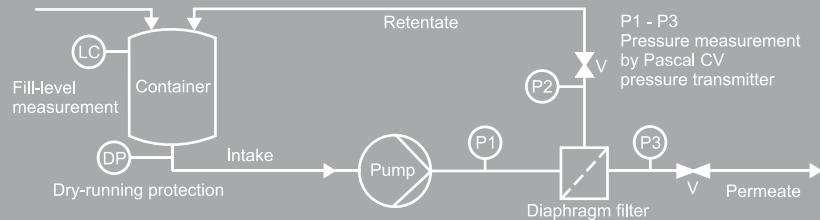
The task: When equipping the newly developed cross-flow ultrafiltration (UF) system with measuring instruments, special requirements for their accuracy had to be met. In cross-flow filtration, a solution used to make a product is recirculated in a closed cycle and then further cleaned. Pressure and flow

measurements allow a determination of the final concentration, thus increasing the yield. Since the new ultrafiltration systems are getting more and more compact, the customer was looking for a supplier of pressure transmitters having DN 10 (10 mm ID) inline diaphragm seals with low temperature drift.

The problem: With the previously used devices, there was a shift in the zero point caused by temperature hysteresis: After the diaphragm seals had been sterilized with hot vapor (at approximately 125°C) then the zero point no longer stood at zero. This meant the devices had to be frequently reset, which had a negative impact on product quality, system availability (downtime) and costs. For this reason, the customer tested candidate devices from several providers for the smallest possible zero-point drift.

The solution: the PASCAL CV pressure transmitter with a DF 5100 inline diaphragm seal (nominal width of DN 10, insertion length of 96 mm). This solution from LABOM allows pressure measurements on small nominal pipe sizes and is suitable for use in narrow, confined areas. What's more, it offers flexible, modular

Cross-flow filtration system

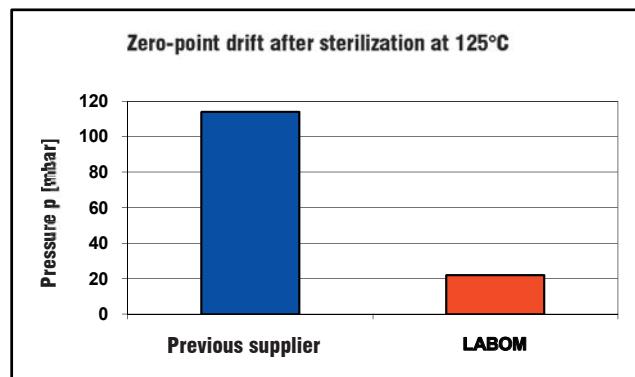


construction with a separate display and switching module. In the customer's testing and evaluation of all competing products, the devices were first sterilized some 20 times in 125°C vapor. Following this step, their output signals were recorded. In the end, the PASCAL CV proved to be the most stable and desirable device, winning out over the competition because of its low temperature drift, digital signal processing and modular construction.

The customer also had great praise for LABOM's professional handling of its product order and the prompt, on-schedule delivery. These factors are particularly important to system installers because all the process steps in very tightly scheduled project management are closely coordinated and sequenced with each other. To assist in this process, LABOM has pre-assembled devices ready in its warehouse and can supply them within a week.

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Since the new system needs three pressure transmitters (two with a display, and a third with both a display and switching output), the PASCAL CV proved to be the ideal choice. This system configuration allowed LABOM to ideally meet all requirements and specifications. In addition, its modular construction means that the PASCAL CV can later be upgraded to accommodate the Profibus protocol.

The customer benefits: The installation of the PASCAL CV has led to increased quality and system availability as well as decreased costs. The increases in quality and efficiency in its new ultrafiltration system led the process technology supplier to also fit its standard cross-flow systems with the PASCAL CV.



DEVICE DESCRIPTION

PASCAL CV, Type series CV311.

- Modular pressure transmitter with diaphragm seal technology
 - Output signal:
 - 4 to 20 mA, optional upgrade HART® protocol available
 - PROFIBUS PA
- Process connection:
 - Inline diaphragm seals (10 mm ID)
 - Insertion length: L = 96 mm
 - TriClamp 1/2", HYGIENIC design
 - Parts in contact with media made of stainless steel, material no. 1.4435
 - Pressure transmitter filled with FDA-approved FD1 foodstuff oil
- Accuracy:
 - Linearity error < 0.15%
 - Hysteresis < 0.05%
 - Repeatability < 0.05%