

Level Measurement in the Food and Pharmaceutical Industries

Application:

Beverage Industry



Digital Pressure Transmitter PASCAL CV with Varivent diaphragm seal DL8080 and PROFIBUS PA output signal



Secret mixtures of liquids are critical for the success of many food and pharmaceutical businesses. LABOM pressure transmitters play a key role in the accurate measurement of these valuable volumes of concentrates.

Effective Measurement of Levels of Valuable Concentrates

Precise and “intelligent” differential pressure measurement with PASCAL CV and PROFIBUS PA

They are handled like gold and often secretly stashed away in bank vaults ... their compositions are the best kept company secrets ... they are the secret mixtures for many successful liquids: these precious concentrates – be they the ingredients for that extra special flavor for “lifestyle” drinks in the food industry, or the basic mixture for products in the pharmaceutical industry – are the backbone of the success of many businesses. It is not surprising that these companies are very interested in the accurate measurement of the volumes of these concentrates in tanks, when the precious base liquids are transferred from their tanks to produce the end products. LABOM’s “intelligent” PASCAL CV pressure transmitter with PROFIBUS PA accurately monitors these concentrates volumes.

The task: Some of the valuable liquid has to be taken from one tank and fed into another one in a company’s production process. Excess pressure of 2.500 mbar is applied in the feed tank via the liquid column with 450 mbar fill pressure. The liquid is transferred from one tank to another by means of this tank pressure – without the use of pumps – over long distances and

through different elevations. The accuracy of the differential pressure measuring device on the tank determines how accurately the required volume of liquid is transferred from the tank, and how accurately the amount of liquid remaining in the tank is measured. However, a number of factors can impair measurement accuracy: For example, when two

transmitters – one for the gauge pressure on top of the tank and the other for the level at the bottom of the tank – are used, their error and manufacturing tolerances may accumulate. Temperature errors may occur, if the transmitting fluid in the transmitter expands or concentrates – due to changes in ambient temperature – thus impacting measuring accuracy.

Solution: LABOM’s differential pressure measuring system via PASCA LCV with two pressure transmitters and PROFIBUS PA output signal compensates for the effects of source of errors, and is easy to use.

Customer benefits: LABOM’s PASCAL CV pressure transmitter comes in a very compact, low-volume casing. Low-volume casing along with reduced-volume diaphragm seals help maintain the temperature drift as low as

possible during changing process and ambient temperatures. The LABOM devices cool down very quickly after the sterilization process, and are therefore able to re-continue delivering accurate measurements quicker than most of their competitors. Temperature errors arising from variations in temperature are calculated by the connected electronics and compensated for. This means that LABOM pressure transmitters have very good temperature characteristics and are able to continue delivering very accurate measurement values under all process operating conditions.

The use of two pressure transmitters allows the vessel top pressure to be evaluated. As the accuracy of the LABOM level measurement system in the example below is less than 1 mbar, a liquid volume can be determined to less than 0.2 % accuracy. The LABOM differential pressure system – using the highly accurate PROFIBUS PA – transmits digital signals to the control unit with almost infinite resolution. This means that volumes can be very accurately differentiated into small volume spans, and small liquid residues in tanks can be accurately measured by the system. Also, wiring and programming are very easy. In systems without PROFIBUS, each pressure transmitter would have to

be wired separately to a control panel and each transmitter would have to be programmed locally on site. In contrast, the PROFIBUS is a more intelligent solution: it is connected to a bus system and programmed from a master computer system, thus reducing wiring costs by two-thirds. Furthermore, the solution for level measurement from LABOM is very easy to install and maintain.

Author: Rainer Scholz
Fon: +49 4408 - 804 - 423
e-mail: r.scholz@labom.com

Additional information on this topic is available directly from LABOM (Export Manager Thomas Tempel Fon: +49 4408 804-460) or from our local office near you (see www.labom.com).



Description of device:

Differential pressure system, comprising digital PASCAL CV pressure transmitter, with Varivent pressure diaphragm seal DL8080 and PROFIBUS PA

- Digital pressure transmitter PASCAL CV3110
Output signal: PROFIBUS PA
- PROFIBUS PA, profile 3.0
Parameterization: SIMATIC PDM
- Process connection:
Varivent diaphragm seal pressure sensor DL8080
Size D = 68
Hygienic design
System fill: FD1 food oil, as per FDA
Base and diaphragm material: 1.4435
- Accuracy:
Non-linearity < 0.1 %
Hysteresis < 0.05 %
Repeatability < 0.05 %

