

Pressure and filling level

– convenient and safe

Pressure and filling level measuring devices in the process industry are generally installed in hard-to-reach positions and are therefore often not easily readable. A new generation of explosion-proof measuring devices offers practical solutions for this problem, at the same time increasing their ease of use.

Pressure measurement in gases and liquids is one of the most common measuring tasks, not just in the traditional process industries – food, pharmaceuticals, chemicals and petrochemicals – but also in many other industrial sectors. Due to intensive research and development in this important market segment, there are now proven solutions available for measuring requirements, including the compensation of temperature drift with pressure measurements.

However, the display of the most modern pressure transmitters cannot always be read conveniently. The devices have to be installed precisely at points on tanks or pipes at which the process pressure needs to be recorded. This applies particularly if the pressure measurement is used to record filling levels – as the display unit is then generally below the base of a tank.



User-friendly and flexible

Labom's new Pascal Ci4 pressure transmitter range, which also includes explosion-proof modifications, offers a remedy for this problem. The device, as well as the display, can both be continuously rotated to adapt to the mounting position. If this is not

sufficient, the display can also be mounted independently of the measuring unit, even in zones at risk of explosion. Thanks to a cable and an additional case for the separate display unit, it can be mounted up to 10 metres away from the measuring point. The user therefore does



not have to crawl into the angle between two pipes, but rather can read off the display as he is passing on his inspection

round. User convenience is therefore significantly increased by the improved localised readability and the user can also configure himself which values he wishes to have displayed and in what size. The measurement ranges of the new devices range from 0.25...16 bar to 0.25...400 bar.

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User convenience can be improved in many sectors with this new design concept from Labom. The various type series of the new Pascal Ci4 range meet the needs of different applications and can be supplied with the appropriate process connections. For instance, there is a hygienic modification with appropriate connections available for users in the food, pharmaceutical and biotechnology sectors.

The particularly sturdy stainless steel design with IP 69K degree of protection as well as the explosion-proof version for use in zones at risk of explosion, qualify the pressure transmitter for the chemical, petrochemical and power generation industries, as well as other extreme industrial applications.

LABOM presented the intrinsically safe modifications of the PASCAL Ci4 pressure transmitters for absolute pressure as well as the PASCAL Ci4 Delta P for differential pressure at the Hanover Messe (HMI) in 2014. The explosion-proofness of the devices is certified in accordance with the ATEX standard applicable in Europe and the IECEx standard applicable in North America and internationally. ATEX certifications II 1/2 G Ex ia IIC for the temperature groups T4, T5 and T6 and II 1/2 D Ex ia IIIC are evidence of the excellent intrinsic safety of the devices in explosive atmospheres with gas and dust. The suitability of the PASCAL Ci4 devices for use in safety-critical environments is also supported by the SIL2-compliant design of the devices and their software. Furthermore, NAMUR guidelines were used as the basis for the development of this device range.

Fast and communicative

An integrated processor in the display guarantees delay-free reaction to operator inputs. This fast response is part of an overall approach to optimise user-friendliness, which also includes intuitive 4-button operation with quick set-up, the dot-matrix display with 80 x 128 pixels and backlight, as well as the option to select different display modes.

Despite all its benefits in terms of parametrisation, calibration and temperature compensation, digital pressure measuring technology continues to be seen as somewhat slow compared to analogue pressure transmitters. It is repeatedly confirmed by many discussions with users of the process industry. Therefore it was a further aim of the development of the Pascal-Ci4 range to attempt to compensate for this shortcoming. All the devices in the range achieve a measuring rate of 20 Hz as standard. This can even be switched over to 100 Hz for applications that require an even higher measuring speed.

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The connection of the local measuring device to the control room is also relevant for the safety of the system. Pascal-Ci4 devices have a HART® interface as standard alongside the 4...20 mA output. The HART® protocol enables EDD-based communication with PDM and 375/475 Field Communicator as well as DTM-based communication with FDT systems, such as Pactware.

Comprehensive parameterisation, simulation and diagnostic functions do more than just improve user convenience, and, by preventing operating errors, they also contribute to operational safety. The diagnostic functions also include an operating hours counter, linked to the maintenance counter, which reminds users to check the device after a freely definable number of days connected to power.

Special field – differential pressure measurement

The recorded pressure is transmitted directly to the sensor via capillaries using the transmission fluid, thanks to the special reduced volume design combined with diaphragm seal technology. The influence of the ambient temperature on the pressure measurement is therefore minimal, so that smaller diaphragm diameters can also be used. This is of particular benefit with differential pressure measurement to determine the filling level in sealed or pressurised tanks.

The Pascal Ci4330 differential pressure transmitter from Labom's new transmitter range is specifically designed for filling level applications, such as the above, in conjunction with diaphragm seal technology. The manufacturer also uses his patented diaphragm seal technology for this to reduce the influence of process temperature by means of selected diaphragm contours. The new Pascal Ci4 pressure transmitter range therefore offers an attractive alternative to conventional solutions specifically for filling level measurements.