Inside Labom

Pressure
Temperature
Made to Measure

Tailor-made measurement technology

The successful family-run business Labom Mess- und Regeltechnik GmbH from the northern German town of Hude has been synonymous with special quality and individual customer-oriented solutions for more than 50 years.

As a recognised specialist in digital measurement technology, the pressure, level and temperature measuring devices are used in a wide range of industrial sectors.

Labom currently employs around 190 people and is represented in more than 40 countries. The products are developed, planned and produced at the main plant in Hude in accordance with international quality standards.

MD_001_en_Rev 11.00

TABLE OF CONTENTS

CLOSE TO CUSTOMERS WORLDWIDE

Head of International Sales / Vice Sales Director

FLORIAN SIMPSON

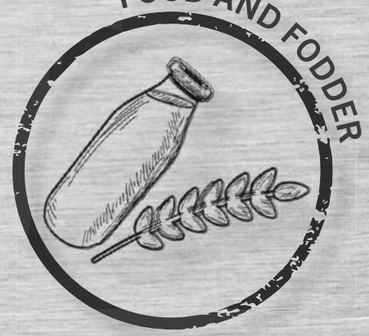
„Personal and close contact with the customer is important for our sales team. We are familiar with our customers‘ systems and can therefore find technical solutions quickly and individually. On the one hand, we have a broad range of standard products with which we can serve many industries and applications. On the other hand, our strength lies in the development of customer-specific solutions, which we produce at our headquarters in Hude. We work globally with a strong network of selected sales partners to meet our own requirements. Short delivery times and high product quality are our top priority.“

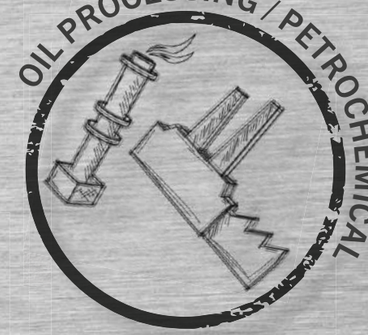
Head of shipping department

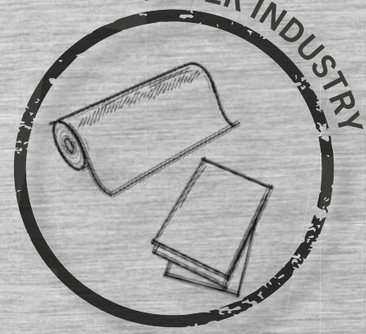
ASTRID SÜTERING

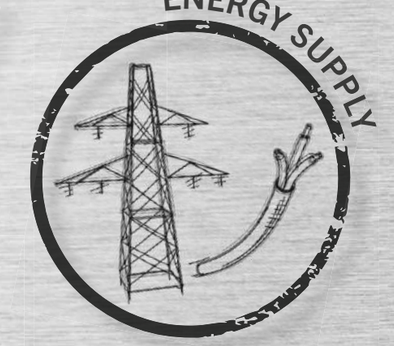
„We supply to countries all over the world from northern Germany. The focus is on short delivery times and optimised shipping costs. To ensure that the products and the appropriate documentation arrive at our customers safely and quickly, we work with a large number of forwarding agents and can therefore find the best individual solution for the delivery. Thanks to our close contact with our colleagues in sales, we guarantee short response times for your enquiries. We regularly optimise our work processes and also promote the digitisation of customer processes.“

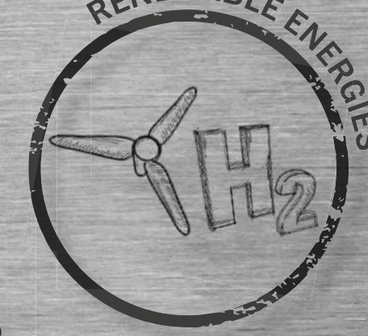
OUR INDUSTRY OVERVIEW

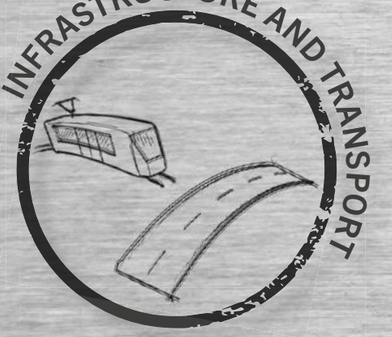


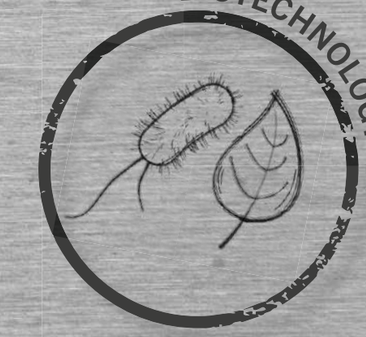












QUALITY MADE IN HUDE

Head of Production
JÜRGEN ERDMANN

Probably the most exciting area in the company premises – Head of Production, Jürgen Erdmann, talks about his very special department.

Mr Erdmann, what is it that you do in the production department?

We manufacture high-quality measuring devices for many industries, notably for factories producing pharmaceuticals, food and chemicals. Labom produces its instruments exclusively on its own premises in Hude, northern Germany. This is where piles of stainless-steel rods are transformed into highly complex measuring devices for temperature, pressure and filling levels. Our highest priority is quality.

What makes this special quality possible? What do you do differently from others?

Firstly, we have high levels of vertical integration and rely on materials of particularly high quality. For example, we manufacture the housings and process connections for our measuring devices ourselves from high-quality stainless steel in our in-house machining department. Secondly, we attach particular importance to having well-trained specialists, especially technicians trained in precision mechanics and mechatronics. Many of our production employees learned their trade as apprentices with Labom. I did too, when I joined the company in 1996.

Have many other employees been with the company that long?

Absolutely. It is a bit of a joke to celebrate 25 years with the company, because many of our specialists have been with us for 30 years or more. Some of them had fathers who worked here and have brothers and sisters in the team. Having such long-serving employees is of course a tremendous asset for the company in terms of expertise.

What about your own role in the production department?

We do practically everything ourselves here, from making the stainless-steel housings to carrying out the meticulous final inspection of the finished devices. Good management structures are a must to ensure everything runs smoothly. I developed these with the help of my colleagues. Of course, the structures need constant adaptation to new requirements. It is an ongoing process to keep everything running smoothly, even when something unforeseen happens. To achieve what seems unattainable – that is both our challenge and our motivation.

INSIGHTS INTO PRODUCTION

Everything comes together in production, where the plans of the developers and the solutions the sales department has chosen together with the customer, are realised. We asked our employees in the production department what makes their working lives so special and why they find their job exciting.

FILLING ROOM FOR PRESSURE SYSTEMS

„We work here to high levels of precision – I feel proud we are able to do that well.“

– Georgios

MECHANICAL PRESSURE DEVICES

„I get to work with many different tools and instruments. What other job gives you that opportunity?“

– Timo

WELDING DEPARTMENT

„In the welding shop we are always confronted by new challenges – and we love it!“

– Sandra

ELECTRONICAL PRESSURE DEVICES

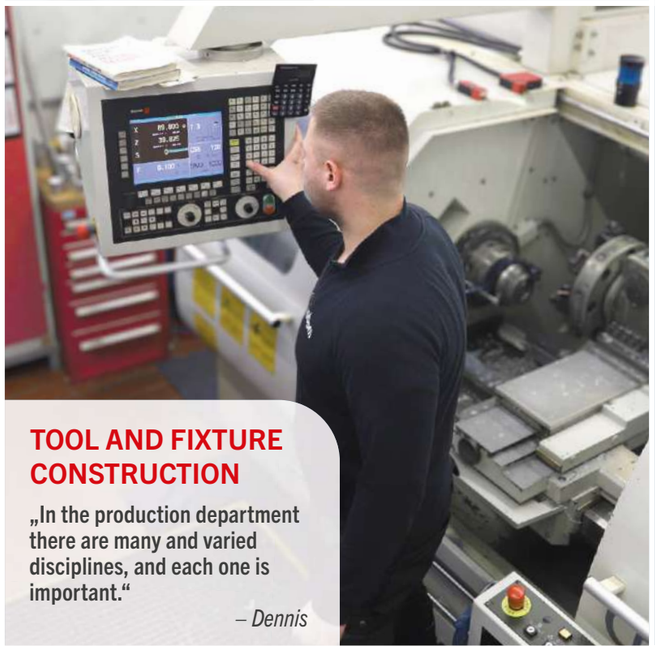
„Truly innovative technology is being created here – and I am helping to realise it.“

– Simone

TURNERY

„It is the combination of craftsmanship and state-of-the-art technology that makes my job so exciting.“

– Nils



TOOL AND FIXTURE CONSTRUCTION

„In the production department there are many and varied disciplines, and each one is important.“

– Dennis

TEMPERATURE DEVICES

„It‘s always great to see how carefully planned new products finally become reality.“

– Sven

CALIBRATION AND SERVICING

„I feel really good knowing I‘ve made sure everything is running smoothly.“

– Sebastian + Sebastian

FIND THE OPTIMAL SOLUTION

R&D Director
DR. THOMAS KÖSTER

Only stop when the quality is right – that is the task of the R&D team. Dr. Thomas Köster, head of the department, will introduce us to his department.

Dr. Köster, how can we envisage the R&D department – what are its tasks?

We turn sensors into measuring devices. This includes mechanical components such as housings,process connections and diaphragm seals as well as the development of electronics and firmware. The R&D department is also responsible for approvals and regulatory compliance.

Where do the ideas for new measuring devices come from?

The sales department collects and structures customer requests and market trends. Monitoring the competition also provides lots of important information. In addition, we monitor the relevant technology trends in our team. Sometimes an employee simply has a clever idea. The plan for further development is then derived from this information together with the sales and management teams.

What about very special customer requirements, the keyword being „individual solutions“?

As a medium-sized company, we can respond quickly and flexibly to requirements. These may also be specific customer requests. Development and production are geared to special solutions for individual customers. This ranges from small modifications, for example to the housing, through to entire devices developed for a customer.

What do you think is the key to success in developing high-quality measuring devices?

Certainly a lot has to come together. But definitely the intensive cooperation between the individual disciplines in our R&D department and the close exchange with the sales department. In a direct dialogue, many problems can be avoided before they arise. In addition, the know-how and the often long-standing experience of my team. The most important thing in my opinion is the high level of quality awareness as part of the Labom culture.

ELECTRONIC PRESSURE MEASUREMENT

The spectrum of demands on pressure transmitters in the process industries, in the energy industry and in mechanical and plant engineering is extremely diverse.

Pressure is one of the most commonly measured values in process engineering, and yet virtually no process is identical to another. Individual solutions are often superior to standard equipment in terms of accuracy and safety, but generally cost more and require more development time. Labom provides highly flexible support to plant engineers and operators with the rapid provision of equipment and last but not least the retrofitting of processes with a high number of measuring points.

Business Development

TIM WEHLAU

Pressure measurement in gases and liquids is one of the most important measurement tasks, not only in the classic process industries of food, pharmaceuticals, chemicals and petrochemicals, but also in many other industries. Whether hygienic, intrinsically safe, SIL-compliant or accessed via HART® or locally readable – Labom covers all requirements with its product range of electronic pressure transmitters.

Universal pressure transmitter

PASCAL CI4

For relative and absolute pressure

The ultimate in measuring accuracy, process robustness combined with intuitive and convenient operation – that's the PASCAL CI4 range. The HART7 standard guarantees flexible integration into control systems and compatibility with divers equipment landscapes.

Ex HART COMMUNICATION PROTOCOL SIL2 CERTIFIED ECHEDG TYPE EL CLASS I LAB4 LEVEL

CI4100
With threaded connection

CI4110
For diaphragm seal operation, hygienic

CI4120
For diaphragm seal operation, sturdy

HIGHLIGHTS

- Measuring range from 0.25...1050 bar
- Accuracy ≤ 0.1 % / 0.075 %
- Suitable for hydrogen applications
- Various process connections for hygienic and sturdy applications
- Comprehensive parameterising, simulation and diagnostic functions
- High measuring rate up to 100 Hz
- NAMUR-tested to NE95

Pressure transmitter with high-resolution graphic display

The structural design of the devices featuring a high-resolution graphic display, intuitive operation and various process connections is suitable for a wide range of applications in the processing industry, chemistry, machine and plant engineering, as well as in energy technology.

Equipped with the LAB4Level operating software, the transmitters are suitable for level applications.

Pressure transmitter

PASCAL CI43 DELTA P

For differential pressure and filling level

The CI43 is ideal for pressure and differential pressure measurements in aggressive substances or at high process temperatures through the use of high-quality materials for wetted components, such as tantalum, Hastelloy, PTFE and the like.

Ex HART COMMUNICATION PROTOCOL SIL2 LAB4 LEVEL

CI4330
Differential pressure and level transmitter

CI4340
Differential pressure transmitter, high overload protection up to 160 bar

CI4350
Differential pressure and level transmitter, high overload protection up to 160 bar

Differential pressure transmitters for filling level measurement and filter monitoring

The uniform concept for pressure, differential pressure and filling levels facilitates the monitoring of systems, simplifies spare parts storage and minimises training requirements.

Equipped with the LAB4Level operating software, the measuring devices can calculate and display filling level, volume and weight simultaneously.

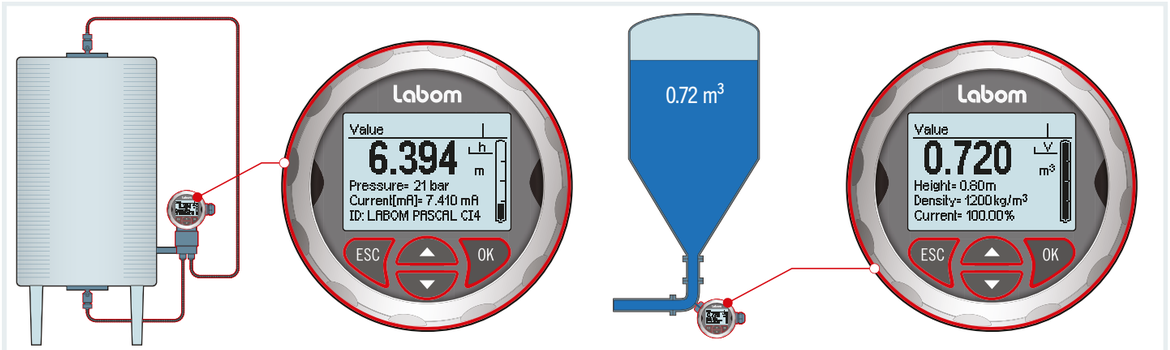
HIGHLIGHTS

- Measuring range from 10 mbar...40 bar
- Accuracy up to ≤ 0.07 %
- Reduced-volume design for diaphragm seal systems with small nominal sizes
- Max. working pressure up to 400 bar
- Suitable for hydrogen applications
- Simultaneous display of differential pressure and static pressure possible
- Long-term stability of 0.1 % within 5 years
- Output functions: linear, invers, square root, table function with up to 64 support points

TECHNOLOGIES AND OPTIONS

Hydrostatic level measurement, or by means of differential pressure

For the Ci4 series, Labom offers the optional operating software **LAB4Level**. The software can simultaneously calculate and display fill height, volume and weight. The figures are displayed in the selected unit or as a percentage, as required. Various layouts enable the display to be adapted to the user's need for information. Measuring filling levels using differential pressure transmitters with diaphragm seals is ideal, for example, when aggressive media or hygienic requirements require a separation of process and instrument side, or if tanks are pressurised.



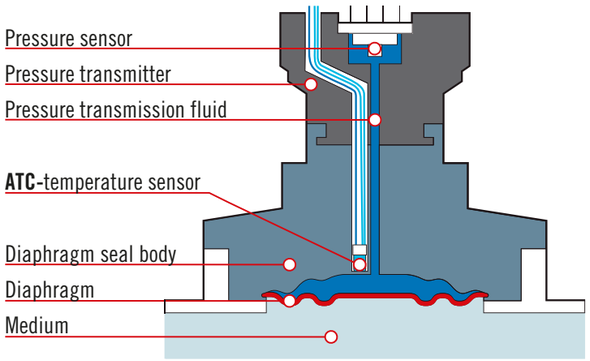
Level by differential pressure *Hydrostatic level measurement*

TEMPERATURE ERROR COMPENSATION

Mathematical correction of the measurement error in diaphragm seal systems

Labom has developed a further compensation process to eliminate the disadvantages of the influence of process temperature on diaphragm seal systems. The temperature of the pressure transmission fluid is recorded with an additional temperature sensor with the ATC technology (ATC = Active Temperature Compensation). The resulting measurement errors from the process heat can therefore be mathematically corrected.

Temperature errors can therefore be reduced by 80 - 90 % thanks to this process. High-precision pressure measurements can thus be carried out together with the high accuracy of the pressure measuring device.



INTUITIVE OPERATION

Optimised menu navigation

The quick set-up summarises all the key setting parameters in a single menu. Various configurable displays enable users to select which and how many subordinate variables are displayed. All parametrisation data can be copied from the device to the configuration memory in the display module. It is stored permanently there. This enables parameters to be transferred simply and quickly to other devices.

Practical display modes

The display structure can be adapted to the requirements of the measuring point. There are five different display modes with configurable content.

REMOTE DISPLAY

For concealed or hard-to-reach measuring points

- The display and control unit can optionally be fitted up to 10 metres away from the measuring point
- Fully-operational control module: with the same functionality as when operating directly on the unit

Compact pressure transmitter

PASCAL CV41

For relative and absolute pressure

The V-line devices combine a very compact construction with the largest possible display. The intuitive 4-button operation assists the user with a dialog window that optionally can be set to English or German language on a high-resolution and well-illuminated dot-matrix display. A special quick setup feature simplifies speedy installation and configuration of the devices.

TO THE VIDEO

CV4100
With threaded connection

CV4110
For diaphragm seal operation, from hygienic to sturdy

HIGHLIGHTS

- Compact and small design
- Measuring range from 0.25...1050 bar
- Accuracy up to ≤ 0.1 %
- Suitable for hydrogen application
- Various process connections for hygienic and sturdy applications
- Comprehensive parameterisation, simulation and diagnostic functions
- Quick access to device data

Pressure transmitter with intuitive operation

High quality metrology, hygienic design combined with compact design and easy to read display - that's the PASCAL CV4 range.

- Fast response due to high processor performance
- Display removable under voltage

Pressure transmitter

PASCAL CV43 DELTA P

For differential pressure and filling level

The digital differential pressure transmitter PASCAL CV4 Delta P is suitable for level measurement on pressure vessels and for monitoring filters. Its compact design and the rotatable display qualify it for use in small systems. This is made possible by individual alignment options even in confined spaces.

CV4300
Differential pressure transmitter, compact design

CV4330
Differential pressure transmitter, for diaphragm seal operation

Comprehensive parameterisation, simulation and diagnostic functions are possible both via the 4-button user guidance directly on the device and via HART® protocol.

- Digital communication via PDM, FDT/DTM, 375 / 475 Field Communicator
- Output functions: linear, invers
- Table function with up to 32 support points

HIGHLIGHTS

- Compact and small design
- Measuring range from 0.25...40 bar
- Accuracy up to ≤ 0.1 %
- Various process connections with diaphragm seal technology
- Smallest nominal widths from DN 25
- Turn down up to 20:1
- Output signal 4…20 mA with HART®-protocol
- Comprehensive parameterisation, simulation and diagnostic functions
- Quick access to device data

Pressure transmitter

PASCAL CV3

Professional pressure transmitter with smart modular Technology

Smart function modules for display, switching and communicating allow you to configure the device to deliver the best electronic signal conditioning solution for the application at hand. Convinient „plug technology“ means that you can extend or replace these modules with ease on site without having to recalibrate or remove the device from the process („plug and measure“). Automatic module detection renders programming redundant.

CV3100	Basic module	Display	Switch	HART®
With threaded connection				

HIGHLIGHTS

- Smart modular technology system
- Functional modules can be exchanged on site „plug and measure“
- Measuring range from 0.4…400 bar
- Accuracy ≤ 0.15 %
- Optional output signal with HART® protocol
- Switching function

CV3110
For diaphragm seal operation, hygienic

CV3120
For diaphragm seal operation, sturdy

CV3330
For filter monitoring or level measurement

Pressure transmitter

PASCAL CS

For measuring, switching and indicating

CS2100
With threaded connection

CS2110
For diaphragm seal operation, hygienic

CS2120
For diaphragm seal operation, sturdy

The multifunctional PASCAL CS displays the measurement; outputs a current signal proportional to the pressure and optionally has two switching contacts. Pressure transmitter and switching outputs are galvanically isolated.

HIGHLIGHTS

- Functional, rotatable, case in seamless design
- 4-Digit LED display, mirrorable by 180°
- Measuring range from 0.1…400 bar, Accuracy ≤ 0.2 %
- 2 isolated switching outputs

UNIVERSAL CA

Measuring relative and absolute pressure

CA2100
With threaded connection

CA2110
For diaphragm seal operation, hygienic

CA2120
For diaphragm seal operation, sturdy

The pressure transmitter UNIVERSAL CA is suited for measuring gauge pressure and absolute pressure of gases, vapors and liquids. An easy zero-point setting is possible by using a magnet.

HIGHLIGHTS

- Stainless steel case, degree of protection IP 65
- Directly ventilated sensor element
- Measuring range from 0.1…400 bar
- Accuracy ≤ 0.2 %

Pressure transmitter

COMPACT IO-LINK

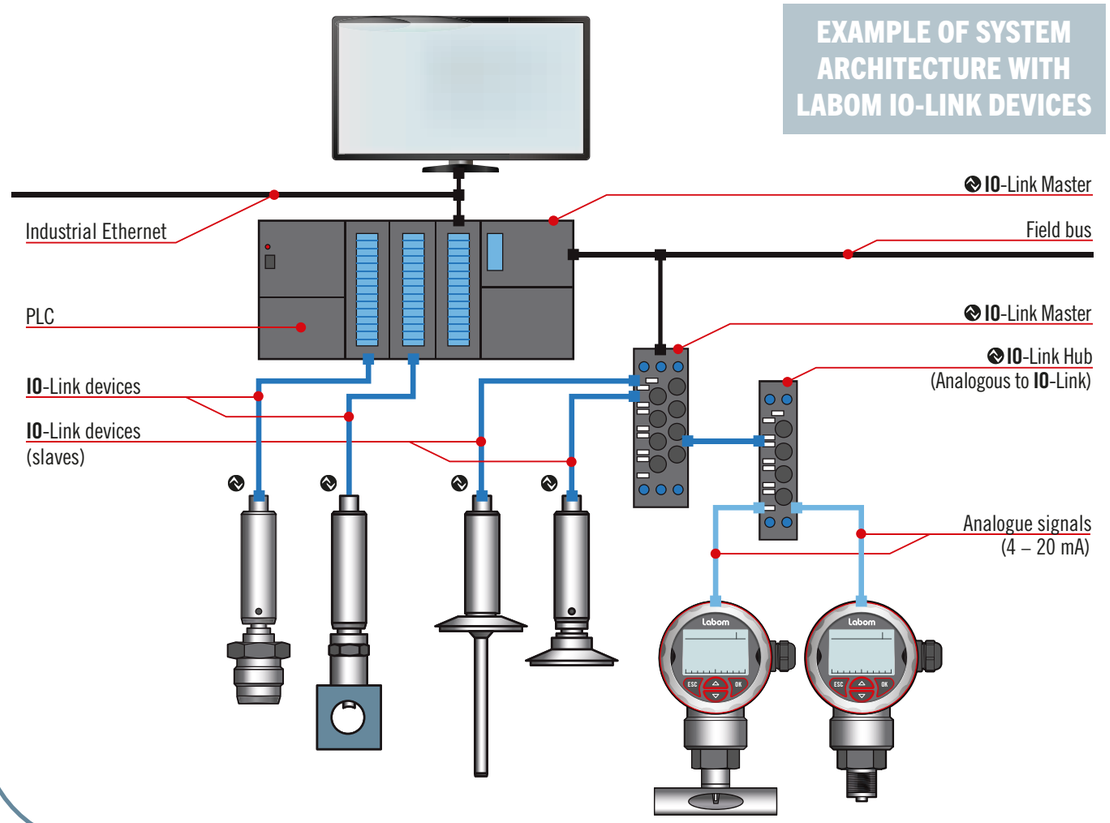
The pressure transmitter COMPACT with IO-Link is suited for measuring the relative pressure of gases, vapors and liquids. It brings with it the advantages of IO-Link technology, e.g. rapid reaction time due to high data rate and short cycles or simplified sensor replacement and automatic parameterisation in the event of a fault.

CA1510
Pressure Transmitter
for hygenic use

HIGHLIGHTS

- Output signal IO-Link V1.1
- Data transmission rate COM 3 (230,4 kBaud)
- Accuracy ≤ 0.3 %
- Maximum of 2 switch outputs
- Approvals / certificates as an option
- Various process connections with diaphragm seal technology
- Hygienic design possible
- Electropolishing of wetted parts upon request
- Case and wetted parts made of stainless steel, degree of protection IP 65

EXAMPLE OF SYSTEM ARCHITECTURE WITH LABOM IO-LINK DEVICES



Pressure transmitter

COMPACT

With internal or flush mounted diaphragm

CB6010
With threaded connection

CB6020
With temperature decoupler

CC6010
For diaphragm seal operation, hygienic

CC6010
For diaphragm seal operation, sturdy

Because of their robust design the pressure transmitters of the COMPACT series are suitable for use in tough environments. The flush mounted diaphragm allows deadzone free measuring and the use of temperature decouplers means that the COMPACT pressure transmitter can be used for process temperatures up to 200 °C.

HIGHLIGHTS

- Case and wetted parts made of stainless steel
- Measuring ranges from 0…250 mbar up to 0…1050 bar
- Suitable for hydrogen applications
- Accuracy ≤ 0.2 %
- Signal output 4…20 mA, optional 0…20 mA

COMPACT ECO

For standard applications

CA1100
With threaded connection

CA1110
For diaphragm seal operation

CA1600 HYDROGEN
For hydrogen applications

The pressure transmitter COMPACT ECOnomic is suitable for measuring the relative and absolute pressure of gases, vapors and liquids. It can be used for measuring temperatures from -20…120 °C and an easy zero-point setting is possible by using a magnet.

HIGHLIGHTS

- Stainless steel case, degree of protection IP 65
- Measuring ranges from 0…1 up to 0…1050 bar, 1…0 up to -1…15 bar
- Suitable for hydrogen applications
- Accuracy ≤ 0.5 %

UNIVERSAL

The analog pressure transmitter UNIVERSAL is suited for measuring the relative and absolute pressure of gases, vapors and liquids. The differential pressure transmitter CP1310 has been specially designed for measuring the differential pressure of gases. The integrated overload switch of the type series CD102. is designed for continuous overpressure and has no wear parts. Because of its robust design, the pressure transmitter CB203. HDD is suitable for use in tough environments.

CB1(2)02

Measuring relative and absolute pressure

CP1310

Differential pressure transmitter, for filter monitoring

CD102.

Can be overloaded up to 100 times

CB203. HDD

Heavy duty design

HIGHLIGHTS

- Case and wetted parts made of stainless steel
- Accuracy ≤ 0.3 %
- Measuring ranges from 0…160 mbar up to 0…400 bar rel., 0 … 0.4 up to 0 … 25 bar abs.
- Explosion protection and IECEx

The analog pressure transmitter UNIVERSAL is available in two different designs of housings, the standard housing with right angle plug or stainless steel field housing for use in tough environments. Zero-point and measuring range are adjustable from the outside.

Labom approved ©

WE SOLVE YOUR H_2-TASKS

Hydrogen is an energy carrier with high potential. Surplus energy from renewable energy sources can be used to produce hydrogen via electrolysis and thus store the energy. Hydrogen is also the initial material for Power2X processes. The importance of hydrogen has also been recognised at the state level. Strategy papers and subsidies are intended to ensure that hydrogen establishes itself as an energy carrier on the market.

But hydrogen also brings challenges: Hydrogen is a flammable, explosive gas that is processed under high pressure, depending on the application. Measures for explosion protection, functional safety or the pressure equipment directive are often necessary.

The unique properties of hydrogen pose a particular challenge.

At Labom, we have been dealing with this forward-looking topic for many years and have reliably used measuring instruments specifi cally for applications in which hydrogen is used.

With our calculation tool for hydrogen applications, we can offer our customers the most cost-effective and technically suitable solution.

HYDROGEN FOR ENERGY STORAGE

The variable nature of renewable energy is considered one of the greatest challenges in implementing the energy transition: Solar and wind sources cannot be regulated according to the needs of electricity customers at any given time. The development of workable and economic power storage technologies is therefore a decisive factor for success of the energy transition. Labom is at home both in the equipping of wind turbines in close cooperation with leading manufacturers and in the energy storage segment in terms of metrology. Hydrogen plays a key role in the storage of surplus energy. Surplus energy from renewable energy sources can be used to produce hydrogen via electrolysis in order to store the energy. Hydrogen is also the initial medium for Power2X processes.

Nevertheless, handling the smallest molecule in existence also presents a challenge: Hydrogen dissolves in numerous metals and is so small that it penetrates stainless steels and causes some types of steel to become brittle.

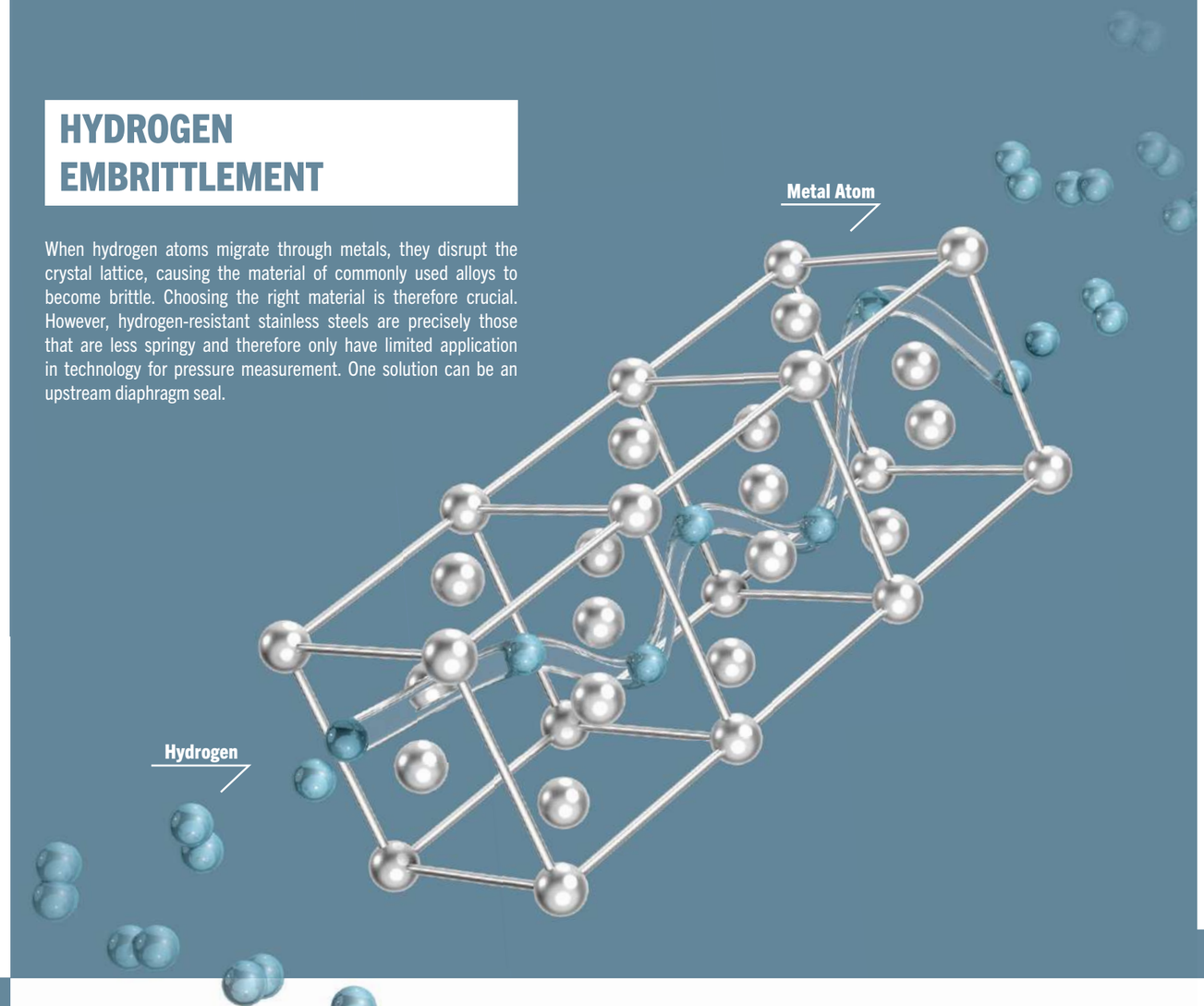
HYDROGEN EMBRITTLEMENT

When hydrogen atoms migrate through metals, they disrupt the crystal lattice, causing the material of commonly used alloys to become brittle. Choosing the right material is therefore crucial. However, hydrogen-resistant stainless steels are precisely those that are less springy and therefore only have limited application in technology for pressure measurement. One solution can be an upstream diaphragm seal.

HYDROGEN PERMEATION THROUGH STAINLESS STEEL

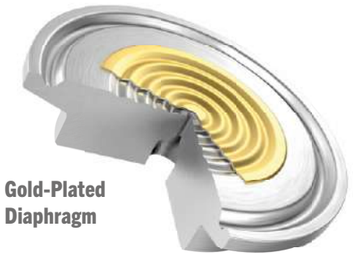
The hydrogen molecule decomposes into hydrogen atoms on the surface of metals and these can diffuse through metals: First the hydrogen molecules decompose into atoms, then the atoms migrate through the tetrahedral and octahedral gaps of the metal lattice and reunite as molecules on the other side. The whole process is called permeation (see illustration).

The rate of permeation depends on the temperature, pressure and material.



RELEVANCE FOR PRESSURE METROLOGY

Diaphragm seals have a thin metal diaphragm on the process side. The pressure is transmitted to the sensor via the diaphragm and a filling liquid, usually oil. If hydrogen penetrates the membrane, it dissolves in the oil. Once saturation is reached, the hydrogen forms beads as the pressure is relieved and this leads to measurement errors such as shifting the zero point.



SOLUTION

Depending on the process conditions, a diaphragm seal with a membrane made of hydrogen-resistant stainless steel, or a goldplated membrane can be used.

We have scientifically investigated the effect of permeation and have developed a tool for calculating the hydrogen permeation and the dissolution of hydrogen in the oil of the diaphragm seal.

To do this, we need information from the plant operator on temperature, pressure and hydrogen content. This is used to calculate how long the service life of the unit would be for different configurations. Among other things, the temperature is decisive for this, since there is a strong temperature dependence - we have therefore also taken this aspect into particular consideration in the calculation formula according to Arrhenius‘ theorem. From the totality of these results, we calculate the service life. We can test this: Is a stainless steel diaphragm enough to get a service life of ten years, for example? Or do we need a gold coating, and if so, what thickness of the coating makes sense?

Try out our hydrogen tool!

DIAPHRAGM SEALS

Diaphragm seals are partitions in pressure measuring instruments which prevent the process media from entering the measuring system. This allows them to protect the gauges from aggressive, highly viscous or solidfying process media as well as from high media temperatures, enabling the connection of the instruments to hygienic processes and the reduction of measurement fluctuations and pressure spikes. They also provide relief in case of an unfavourable location of the pressure measurement and enable the use of pressure gauges in potentially explosive areas as well as a measurement arrangement free of dead space.

The design of diaphragm seals can vary greatly depending on the measurement task they support: Labom is contributing to precise results and greater operating reliability with patented diaphragm types and customer-specific designs for diaphragm seals.

Assistant R&D / Diaphragm seals

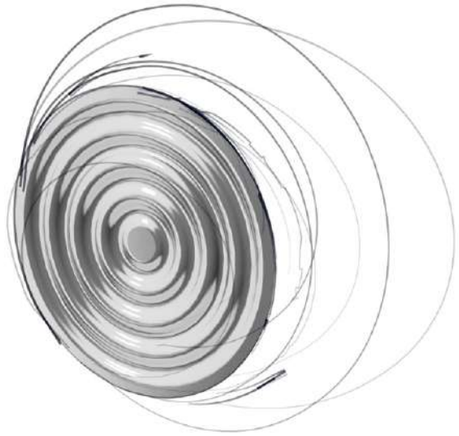
ADINA SUHR

Whether the media is problematic, stringent conditions of hygienic applications are given, or the gauges need to be especially robust to vibration, shock or extreme process temperatures – when the measurement task is unusually difficult, diaphragm seals are the perfect tools for the job.
Working closely with our customers, innovative solutions are created day in and day out for specific projects. Often, technologies that have been developed in this way are used later in serial production.

Process adaption pressure

DIAPHRAGM SEALS HYGIENIC

The wide range of applications for diaphragm seals requires a broad variety of solutions. Therefore, Labom has more than 60 standard models in its programme. For hygienic applications they have to comply with the rules of hygienic design with regard to construction, surface quality of the materials and proper cleanability in the scope of CIP / SIP processes.



DL8080
VARIVENT® for VARINLINE® access unit

DL8140
HYGIENIC Tubus

DE2160
Screw-in thread ASEPTIC with flush-mounted o-ring

DL3 / DL4
Clamp connection per DIN 32676, ISO 2852

DF6
Inline diaphragm seal in aseptic design

DF5100
Inline diaphragm seal, DN 10 with clamp connection

DF1110
Inline diaphragm seal per DIN 11851, IDF and clamp

HIGHLIGHTS

- Hygienic designs with guaranteed surface roughness values
- Volume optimised diaphragm base
- EHEDG-certified designs
- System fillings for various applications
- Various measuring device connections possible

Flat diaphragm seal design

For flat diaphragm seals, the diaphragm lies plane and is usually circular. This facilitates the good spring properties of the diaphragm, thus maintaining low sensitivity of the diaphragm seal to temperature fluctuations.

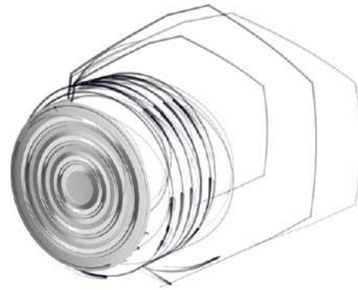
Advantages

Applications with high accuracy or low pressures, as the flat diaphragm shape has good spring properties. Wide range of assembly options. Can be removed, cleaned or calibrated easily.

Process adaption pressure

DIAPHRAGM SEALS STURDY

A large number of applications require particularly robust diaphragm seal technology. Here too, the construction and material of the basic body, the diaphragm, the gasket and, if applicable, coatings play a major role. Labom has a wide range of diaphragm seals for use in abrasive, aggressive and highly viscous media or media with high temperatures.



DA1420
Flange diaphragm seal

DC4680
Cell design

DE1180
Screw-in thread

DD8050
Welded design for high pressure applications

DP2100
Inline diaphragm seal, flange connection cell design

DP4100
Inline diaphragm seal, flange connection

DS1260
Inline diaphragm seal, DN 15 for threaded pipe connection

Inline diaphragm seal design

For inline diaphragm seals, a cylinder-shaped diaphragm is welded into a piece of piping. This ensures the avoidance of turbulence, flow restrictions, dead spaces and other hygienic risks. It must be taken into account, however, that the temperature error may be larger than for flat diaphragm seals.

Advantages

Easy to clean and self-draining. Particularly suited for dead-space free applications, frequent media change, for viscous media.

HIGHLIGHTS

- Basic bodies and flush-mounted membranes made of stainless steel
- Special materials such as tantalum, titanium, Hastelloy, highly vacuum-tight PTFE condenser etc.
- Very low temperature influence
- Filling liquids for various applications
- Various measuring device connections possible

DIAPHRAGM SEAL TECHNOLOGIES

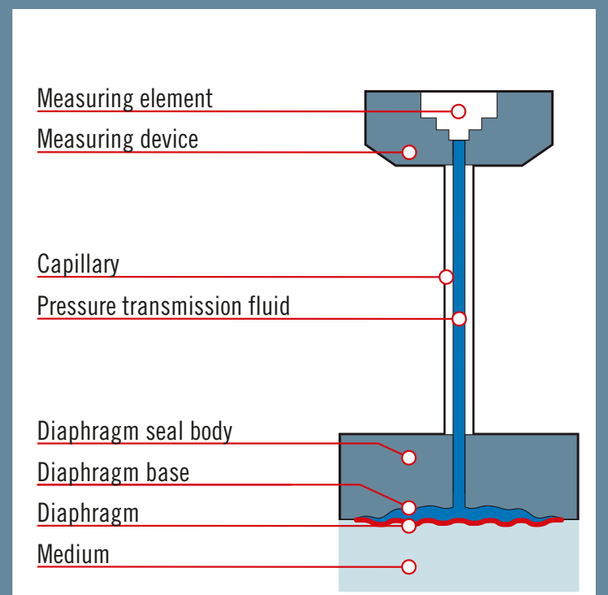
Different designs

Diaphragm seal filling

DEMANDING APPLICATIONS

Many pressure measurement tasks can be performed only with the help of diaphragm seals. Their use also improves the performance of processes and systems and contributes to an increased lifespan of the measurement equipment while reducing assembly and maintenance costs. The diaphragm seals from Labom are perfectly suited for use with our pressure gauges, but they can also be used with gauges from other manufacturers.

The design of the diaphragm seals can vary greatly depending on the measurement task. Nonetheless, three basic components can be identified on any diaphragm seal. Particularly important for the protective function of the device is the diaphragm, a thin film that shields the gauge from the media in the process vessel or pipe. The diaphragm is held in place in the diaphragm seal body, which is called the diaphragm body. It must have a suitable process connection so that it can be integrated into the system to be measured. To transfer the process pressure “caught” by the diaphragm to the measurement element, a pressure transmission fluid (diaphragm seal fluid) is used.



HYGIENIC APPLICATION

Successful customised solutions for challenging use in hygienic and aseptic applications reflect Labom‘s special expertise in this area: Designs with hygienic surfaces and a wide variety of aseptic connections without dead space are available. Labom uses clever techniques, for example extremely reduced volume pressure chambers, which reduce the temperature error to a large degree.

ABRASIVE MEDIA

For use in highly abrasive media, Labom has developed screw-in diaphragm seals with rubber-coated diaphragms. The rubber coating ensures a long lifetime of the diaphragm for pressure measurements in areas where solids may be present in the media, such as in mining, or when measuring sludge or fly ash.

SINGLE-USE-SYSTEMS

For many other measurement tasks, the challenge lies not so much in extreme environmental conditions and measurement values, but rather in the details. For instance, in the pharmaceutical industry, in addition to process containers made of stainless steel, “single-use systems” are now also used. In these “disposable systems”, the process pressure of flexible plastic bags is recorded, in which the media is prepared. For this demanding challenge, Labom developed a flat diaphragm seal with special diaphragm geometry.

AGGRESSIVE MEDIA

For use in military technology, Labom has developed a particularly robust diaphragm seal made entirely out of titanium, which can be used for the measurement of strongly oxidising or chloride-rich solutions or suspensions.

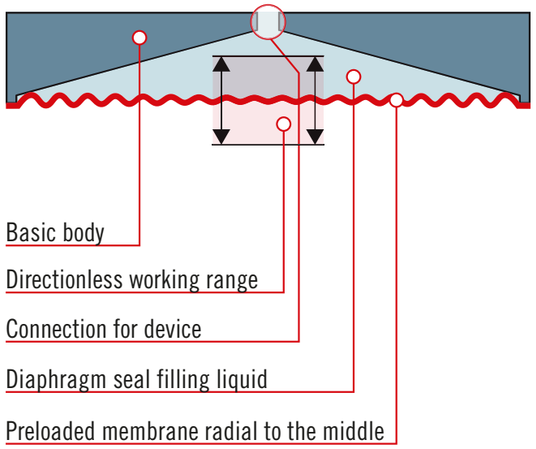
DIAPHRAGM SEAL TECHNOLOGIES

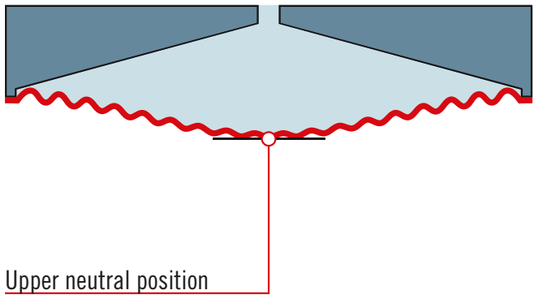
Diaphragm seals are used in very different temperature ranges. A key factor for exact measurement results is, therefore, the compensation of the temperature error. To achieve optimal temperature compensation for every application, Labom offers three different diaphragm types depending on the process requirements: In addition to the sinus-shaped diaphragm, the compensation diaphragm and the LTC diaphragm are also available, both of which are based on a Labom patent.

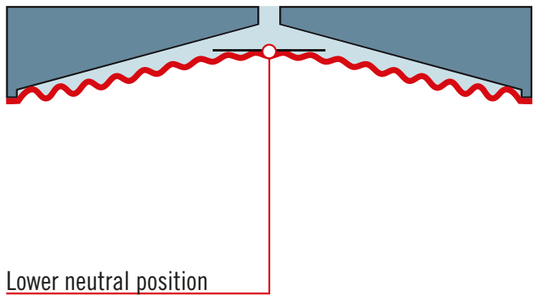
LTC-TECHNOLOGY

Manufacturing processes in the food and beverage industry often involve fluctuating temperatures - a potential source of error and a challenge for measuring devices.

The LTC (Low Temperature Coefficient) diaphragm compensates this temperature-dependent volume expansion of the pressure transmission fluid with a stainless-steel diaphragm. Using a special manufacturing process the mechanically robust stainless-steel diaphragm with a thickness of at least 0.1 millimetres is put into a position between two zero positions and operates in this range with almost no deflection. This allows the diaphragm to absorb volume changes to the fluid due to the influence of temperature so that these fluctuations have practically no effect. Compared to conventional sinusoidal diaphragms, an LTC diaphragm can deliver up to 70 percent greater measurement accuracy.







MATERIALS

STAINLESS STEEL 316L

Stainless steel (1.4404 / 1.4435) is characterised by its generally good resistance and media compatibility. It can even resist weak acids and alkalis, making it the standard material of the pharmaceutical industry.

DUPLEX STEEL

Duplex steel (1.4462) has a high resistance to corrosion cracking in media containing chloride such as pitting. It is well-suited for use in the chemical and petrochemical industry and particularly resistant to seawater.

TANTALUM

Tantalum is the metallic element with the highest general corrosion resistance. With only a few exceptions, tantalum is completely resistant to all pure acids.

TITANIUM

The good corrosion resistance of titanium is based on the formation of a dense and stable protective coating of titanium dioxide. Titanium is particularly well-suited for strongly oxidising and chloride-rich solutions and suspensions. Unlike almost all other common metallic materials, titanium is also resistant to chloride-saturated solutions.

HASTELLOY

The nickel-based alloy Hastelloy is very resistant to crevice and pitting corrosion and corrosion cracking and is resistant to chlorides, mid-concentrated sulphuric acids, acetic acids and phosphoric acids.

MONEL

Monel is a nickel-copper alloy with a good resistance to strong alkalis, most salt solutions, seawater as well as diluted and mid-concentrated inorganic acids.

NICKEL

Nickel is well-suited for application in strong alkalis such as sodium hydroxide or potassium hydroxide.

FURTHER MATERIALS UPON REQUEST

COATINGS

Coatings on a stainless steel diaphragm provide properties that cannot be achieved with a homogeneous diaphragm. The most important coatings are described in the following.

GOLD

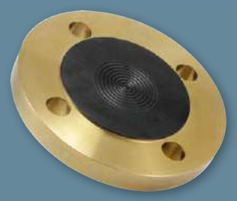
As a precious metal, gold has a very low reactivity. It is particularly suited for hydrogen applications, as a gold coating acts as a diffusion barrier.

PFA

This plastic is used in adhesive media becaus of its excellent anti-adhesive properties. It is also resistant to practically all chemicals and suited to a temperature range from - 40 to 260 °C.

PTFE

In addition to excellent anti-adhesive properties, this plastic is characterised by its very good resistance to strong alkalis and acids. Special designs for vacuum applications up to 200 °C are available, in the overload pressure range PTFE can be used from - 20 to 260 °C.



RUBBER COATING

A rubber coating protects the diaphragm from sharp objects and is consequently used in the cement industry, for instance.

NANOFINISH

Contour-mimicking and infiltration-resistant non-stick coating (thin film) with enhanced corrosion protection. Nanofinish is FDA-conform and silicone-free - also diffusion-resistant and therefore usable for water vapour.

HYGIENIC AND ASEPTIC APPLICATIONS

Pressure gauges and diaphragm seals for hygienic applications must comply with the rules of hygienic design. The design and surface quality of the materials must exclude contamination-vulnerable arrangements and ensure proper cleanability in the scope of CIP / SIP processes. Hygienic diaphragm seals from Labom are typically constructed and produced according to the relevant hygiene standards of the EHEDG (European Hygienic Engineering & Design Group) and 3A regulations.

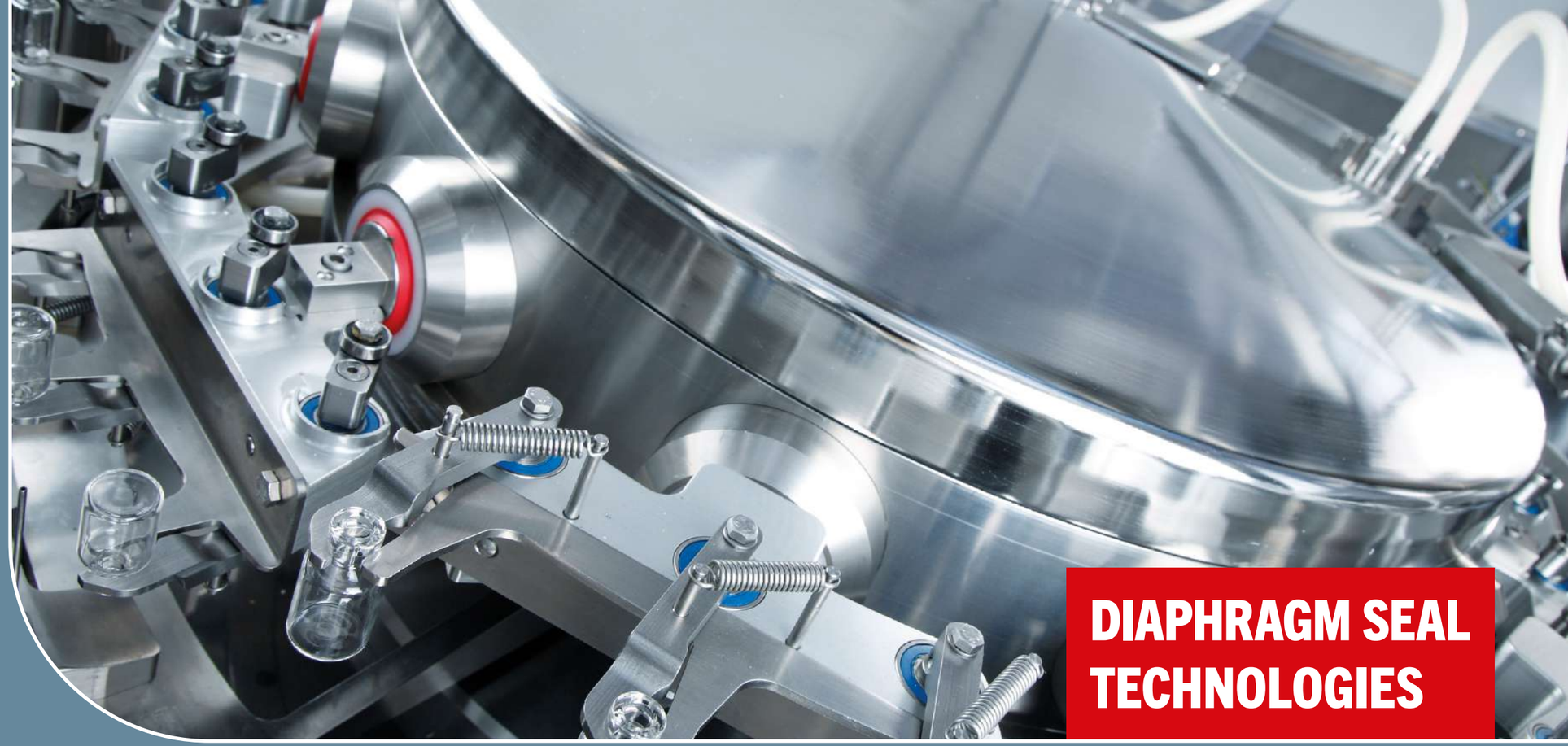
In addition to off-the-shelf solutions according to relevant standards, Labom also realises manufacturer specifications for individual customer solutions. According to the principles of hygienic design, the company guarantees good cleanability, a high level of reliability and no impact on the product.

Labom achieves this high level of hygienic quality by consequently applying hygienic design principles. Important aspects include avoiding design dead space, gaps and edges, using suitable materials as well as the creation of surfaces with low roughness. With respect to the structural design, flush coupling of components and self-draining design are necessary or helpful. If requested by the customer, electropolishing can achieve even higher surface quality.

Other industries can also profit from these special designs. Having no gaps or dead space are also a prerequisite in the paint industry in order to minimise the cleaning cycles between colour changes.

Milled surface

Electropolished surface



DIAPHRAGM SEAL TECHNOLOGIES

HYGIENIC CONNECTIONS

A series of Labom diaphragm seals was also certified by the European Hygienic Engineering & Design Group (EHEDG) as suitable for SIP and CIP applications. The certification includes the models according to DIN 11864 as flange, clamp or screw connection, Varivent®, NEUMO BioConnect® and Diaphragm seals for screw-in thread without gasket are used mainly for dead-zone free pressure measurement. In addition, for applications with less stringent requirements, a number of additional clamp connections or solutions with union nuts are available.

TRANSMISSION FLUIDS

As specialised producer of diaphragm seals for hygienic and aseptic processes, Labom uses a standard pressure transmission fluid that complies with the internationally recognised hygiene standards of the FDA (Food and Drug Administration). For special applications, additional hygiene-compliant filling fluids are available, including medical white oil, deionised water and a water-glycerol mixture.

ELECTRONIC TEMPERATURE MEASUREMENT

The measurement of temperatures is probably the most common measurement task across all branches of the process industry, with the use of resistance thermometers being the most common method of measurement. Temperature measurements with Pt100 elements in particular have proven to be very robust and reliable. In the food/pharmaceutical/biotech sectors, on the one hand the production processes are monitored and controlled. In addition, the steam temperature reached during the usual sterilisation process using saturated steam (SIP) has to be measured and documented. The increased demands on process reliability have led to a steady rise in the number of measuring points in recent years.

International Sales / Order Processing
MERLE OESTING

Resistance sensors use the effect that the electrical resistance of a material changes depending on its temperature. This change in resistance can in turn be measured and converted into a temperature measurement. Pt100 resistance thermometers are used wherever high precision and low drift are required.

„Intelligent“ digital measuring transmitters allow connection to all common Pt sensors and can be easily parameterised online through a local interface or via HART or Profibus.

Temperature transmitter

TEMPERATURE TRANSMITTER GV4

Hygienic

Compact temperature transmitter, optional with self-monitoring

- Compact stainless steel case in hygienic design
- Optional with function package self-monitoring (drift detection, redundancy, drift-/failure warning)
- High-resolution graphic display with intuitive user interface and background lighting
- Accuracy of 0.1% of the set measuring range
- Quick set-up function
- Measuring resistance Pt100
- Process connection bottom or back

HART COMMUNICATION PROTOCOL · CERTIFIED EHEDG TYPE EL CLASS I · c UL us LISTED

MiniTherm GV4730
For invasive temperature measurement

GV4
With HIT-thermowell system

Clamp-on GV4610
For non-invasive temperature measurement

HIGHLIGHTS MiniTherm

- Temperature measuring transmitter for installation in a separate thermowell
- Temperature range -50 … 200 °C
- Measuring insert, spring loaded
- Compact, small design
- Output signal 4…20 mA with HART® protocol
- Degree of protection IP 69K

HIGHLIGHTS Clamp-on

- Temperature measuring transmitter for hygienic surface temperature measurement using clamp-on technology, for pipes with a diameter of 8 … 300 mm
- Various clamping elements for process connection
- Temperature range -40 … 150 °C
- Measuring insert can be recalibrated, replaceable
- Quick and cost efficient installation

Resistance Thermometer

INVASIVE TEMPERATURE MEASUREMENT

Resistance thermometers for hygienic applications

Ex · SIL2 · CERTIFIED EHEDG TYPE EL CLASS I · IO-Link Universal · Smart · Easy · CCC

GA2540
For temperature measurement in pipes and tanks

GA2700 MiniTherm
Fast response

GA2730 MiniTherm
For installation in a separate thermowell

GA2200
Inline temperature transmitter

PA2420
Temperature transmitters (Exemplary accessories)

PA2530

RESISTENCE THERMOMETERS FOR GENERAL APPLICATIONS

Ex · SIL2 · IO-Link Universal · Smart · Easy

GA2510
With screw-in thermowell

GA2511
With flanged thermowell

GA2520
With weld-in thermowell

GA2700
MiniTherm with screw-in thread

HIGHLIGHTS

- Measuring resistance 1 x Pt100 in 3 or 4 wire system
- Interchangeable measuring insert
- Measuring inserts for in-process calibration
- Process connections for the food / pharmaceutical / biotechnology sectors
- Temperature transmitter can be integrated
- Fast response
- Explosion protected devices
- Classification per SIL2

NON-INVASIVE TEMPERATURE MEASUREMENT

CLAMP-ON technology

Patented measuring system for hygienic temperature measurement without media contact

GA2610
with circular connector

GA2610 / GA2611
With field housing

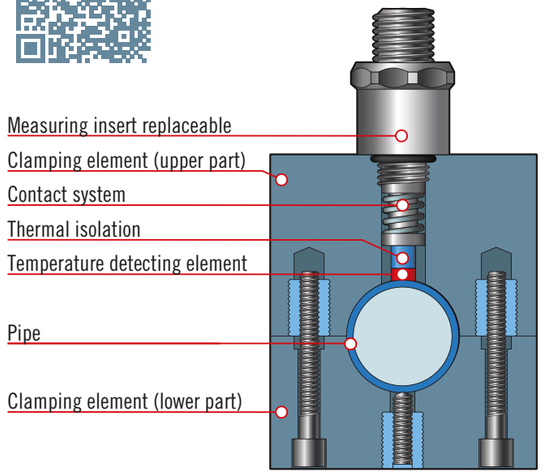
GA2610
For large diameters

HIGHLIGHTS

- High degree of measuring accuracy, fast response
- Quick and low-cost installation
- Measuring resistance 1 x Pt100 or 2 x Pt100, class A
- Media temperature - 40 … 150 °C
- Various temperature transmitter (4 … 20 mA, IO-Link, …) optional
- Explosion protected devices, classification per SIL2

CLAMP-ON SYSTEM

TO THE VIDEO



SURFACES TEMPERATURE MEASUREMENT

Flush-mounted temperature sensor

GA2650

HIGHLIGHTS

- Flush-mounted temperature sensor made of silver, thermally isolated
- Explosion protected devices, classification per SIL2
- Temperature range - 20 … 150 °C

The resistance thermometer for measuring surface temperature is mounted on the surface of the object with a weld-on or weld-in socket.

The measuring insert (6 mm) is replaceable and spring-loaded.

IN-PROCESS CALIBRATION

For resistance thermometers

GA2540
with reference sensor

- Measuring resistance 1 x Pt100 in 3 or 4 wire system
- Measuring insert for in-process calibration
- Process connections for the food / pharmaceutical / biotechnology sectors

HIGHLIGHTS

- Fast responding, available with reduced tip
- Temperature transmitter can be integrated

REFERENCE SENSOR

GA3110

- Measuring resistor per EN 60751
- Measuring sensor Ø 1.6 mm
- Temperature range 0 … 400 °C
- Accuracy according to EN 60751 class A (1 / 3 B)
- Connection with 4-wire system
- Electrical connection with plug upon request
- Calibration certificate per EN 10204-3.1
- DKD calibration certificate

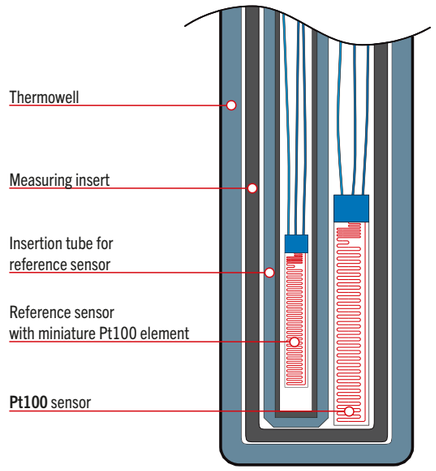
TO THE VIDEO

MEASURING INSERTS

GA3100

- Measuring insert per DIN 43762 with additional tube
- Measuring insert Ø 6 or 4 mm
- Temperature range - 50 … 400 °C
- Measuring resistor per EN 60751
- Accuracy according to EN 60751 class A
- Electrical connection in 4-wire technology
- Calibration of installed resistance thermometer without disassembling the measuring insert

THE FUNCTION OF IN-PROCESS CALIBRATION



Processadaption temperature

THERMOWELLS

Kunden-individuell und nach Norm

Zur Trennung des Temperaturmessgerätes vom Messstoff

HC8030
Thermowell
flange design

HA8010/HA8020
Thermowell
screw-in type

HB8010
Thermowell
weld-in type

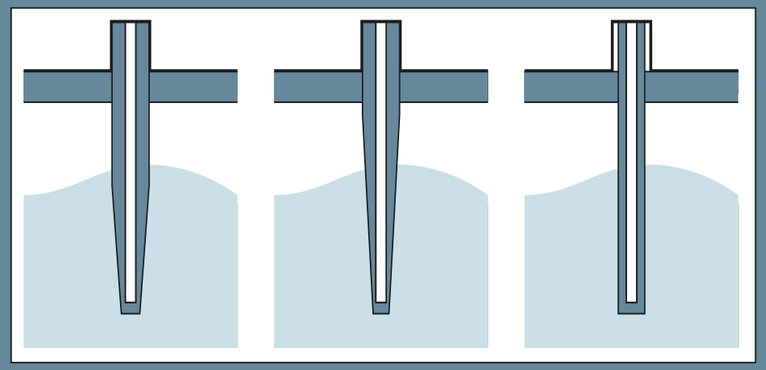
HP1200
Thermowell
clamp type

Labom thermowells are made of thermally conductive materials and are ment to separate the temperature sensor from the product. Thermowells are recommended for use in pressurised processes.

Thermowells provide protection against corrosive products and they allow the thermometer to be replaced easily. Their design has been optimised for use with the corresponding dial thermometer or temperature transducer. On request, we will gladly provide a thermowell calculation and analysis for dynamic operating conditions.

THERMOWELL CALCULATION

Various designs



Labom thermowells are manufactured in accordance with national standards (DIN 43772) or customer specifications. The corresponding LABOM dial thermometers and temperature sensors have been specially designed for optimal compatibility.

Typically thermowells are used in applications where they are to remain in the measured media and only the temperature sensor will be exchanged or retrofitted, or where the temperature sensor must be kept out of direct contact with the product. Thermowells also provide protection against mechanical loads.

As part of our services, we are pleased to offer calculation and analysis of the thermowells to mathematically determine the strength in respect to the static and dynamic load in the individual application.

Processadaption temperature

HIT-THERMOWELL SYSTEM

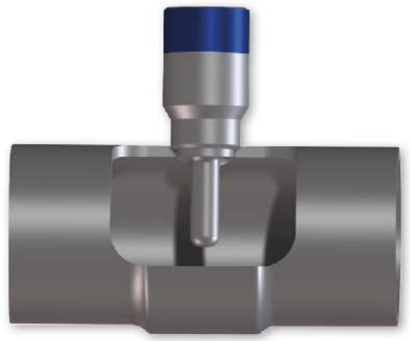
Dead-zone reduced for optimum cleanability

Hygienic invasive temperature measuring (HIT) with various connection technology

Especially for the requirements of the food/ parmaceutical/ biotechnology industry thermowells protect the temperature instrument from the pressure, flow-induced forces, and chemical effects of the process fluid.

Usually the thermowell is welded into the pipeline with the help of a bore hole or it is screwed in. However, this procedure bears the risk that weld seams don´t meet hygienic roughness requirements.

HP1110



3D sectional drawing of HP1110

To solve this problem the use of a HIT thermowell system can guarantee hygienic invasive temperature measurements: It is welded orbitally in a process pipe section (sealfree) or the connection can be made via industry-standard process connections. The HIT system consists of straight pipe sections with an integrated thermowell in one piece. The neck tube with the Pt 100 sensor of the resistance thermometer can thus be assembled and disassembled without any interruption of the process.

This smart invasive measurement method enables a particularly fast responding measurement and a sterile temperature measuring without any gasket. Once installed in the process, the measuring sensor or device can be removed easiliy without production stoppage. A suitable temperature sensor is e.g. the resistance thermometer MiniTherm, type series GA2730.

HIGHLIGHTS

- Wetted parts made of stainless steel material no. 1.4435
- Various connection technology via:
  - Weld-on ends
  - Threaded coupling
  - Clamp connection
- Dead-zone reduced for optimum cleanability
- Surface roughness Ra ≤ 0.76 µm or 0.51 µm
- Delta ferrite content ≤ 3% or ≤ 1 %
- Installation and disassembly of the temperature sensor without process interruption
- Nominal pressure up to 25 bar

Processadaption Temperatur / Pressure

INLINE CASE ASEPTconnect

The Hygienic

Dead-zone free pressure and temperature measurement. Inline case ASEPTconnect with aseptic clamp connection allows for residue-free cleaning and sterilisation.

MZ2300

TO THE VIDEO

VIEW FROM TOP

This Inline case is not only CIP- and SIP-capable, but also enables via an aseptic clamp connection a dead-zone free installation of pressure and temperature devices in fixed piping systems. The connection to the process is made by orbital welding or as a clamp connection, even for very small nominal diameters.

HIGHLIGHTS

- Inline unit with aseptic clamp connection per DIN 11864-3, model A, dead-zone free
- Process connection: Pipe ends or clamp connection
- Integrated gap-free O-ring seal

- Different pipe sizes available
- Hygiene-based design
- Suitable for CIP and SIP
- Pipe endings suitable for orbital welding
- Delta ferrite content < 0.5 %

CIP CLEANING

CLEANING IN PLACE

Automated cleaning procedure of closed equipment or a closed process system – no dismantling.

SIP CLEANING

STERILISATION IN PLACE

Automated sterilisation of a closed process system, which removes or kills micro-organisms, often using superheated steam at 121 °C or more.

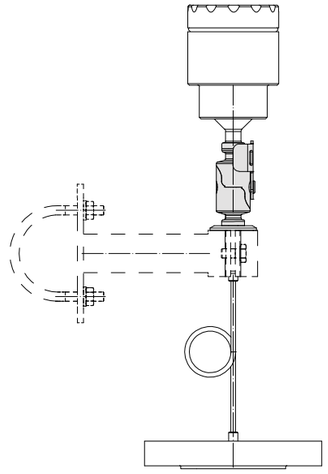
REconnect FAST COUPLING

Safe separation and connection of diaphragm seal systems

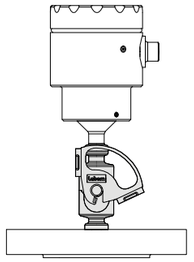
The REconnect fast coupling is welded between the measuring device and the process connection and enables easy and safe separation and connection of diaphragm seal systems.
Replacing or calibrating measuring devices is thus no longer a time-consuming and costly procedure and the process does not have to be opened. The measuring device and diaphragm seal can be reconnected just as easily and the plant can be put directly back into operation. This is an advantage especially for hygienic processes and those handling toxic or delicate substances, as is common in the pharmaceutical industries, or in particularly large and complex plants - such as in the chemical industry.
The fast coupling consists of the parts coupling element measuring device side, coupling element process side and coupling bracket.

The fast coupling can be positioned in various ways, depending on the application. Here are three examples:

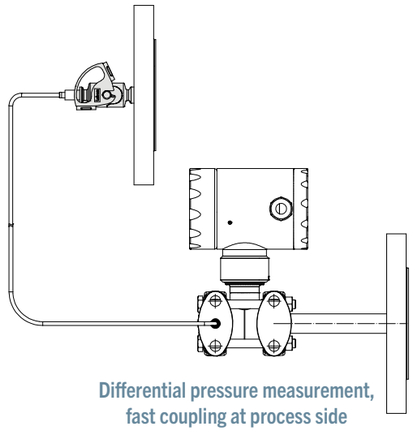
TO THE VIDEO



Diaphragm seal system with capillary, fast coupling at measuring device side



Diaphragm seal system, direct connection



Differential pressure measurement, fast coupling at process side

HIGHLIGHTS

- For calibration processes and replacements of measuring devices
- Leckage-free separation without loss or shifting of filling oil volume or entry of air
- Separation process can be repeated many times
- Use under vacuum possible
- All parts made of high-quality stainless steel
- Suitable for applications in Ex and SIL

MECHANICAL PRESSURE AND TEMPERATURE

Mechanical pressure gauges are mainly used in industrial measuring applications for local measurements and reading off the pressure. They have a simple, robust and reliable design and do not require any external energy. They transmit the pressure through the elastic deformation of a baffle wall within a pressure chamber. This deformation is mechanically transferred to the pressure display.
Mechanical pressure gauges are used in a wide pressure range from 2.5 mbar to 1,000 bar because of the simple measuring principle and robust design. Mechanical measuring equipment at Labom is manufactured according to EN 837.

Area Sales Manager / Europe + Africa
LENNART ERREN

Mechanical temperature measuring equipment has a simple, robust and reliable design. It does not require any external energy supply in order to function. Bi-metal or gas expansion systems are usually used for dial thermometers. Labom dial thermometers correspond to the requirements of EN 13190.

Mechanical measuring devices

PRESSURE GAUGES

The standard

Proven stainless steel devices for industrial use

The bourdon tube pressure gauges and diaphragm pressure gauges are suitable for use in various industries. The stainless steel design has proven itself for measuring gaseous, liquid and aggressive media. The safety standards according to EN 837-1 apply. There are numerous variants in terms of equipment, measuring ranges and process connections.

BA42 / 43

with bourdon tube, high quality design

BA2200

Diaphragm pressure gauge

BH4

With bourdon tube for diaphragm seal

BB2000

Absolute pressure gauge

BA62 / BA63

High-precision measurement gauge with mirror scale

HIGHLIGHTS

- High-quality bayonet ring case in NS 63, NS 100 and NS 160
- Optionally available as S3 safety case according to EN 837-1
- Measuring ranges from 2.5 mbar to 1600 bar and 60 mbar to 2500 mbar abs.

- Case and measuring element of stainless steel
- High overload protection
- Accuracy classes 0.6 to 1.6
- Explosion protection for mechanical devices, connection to zone 0 possible

Mechanical measuring devices

PRESSURE GAUGES

With switch function

Sturdy design, various applications

The bourdon tube pressure gauges and diaphragm pressure gauges with switch contact (electronical contact device) are suitable for use in measurement and control systems for indicating and monitoring pre-selectable minimum and/or maximum pressure values. Mechanical contacts are used as slow acting contacts or with magnetic snap contacts. The devices can also be supplied with inductive contact.

BE4

Bourdon tube pressure gauge

SIL2

BE2200

Diaphragm pressure gauge

BG3200

For differential pressure, highly overload-protected

BN4200

Pressure switch for supervision

BF2200

Absolute pressure gauge

- Case and measuring element of stainless steel
- Contact devices according to EN 16085
- Features: Slow acting contact, magnetic snap contact, inductive contact devices

HIGHLIGHTS

- High-quality bayonet ring case in NS 100 and NS 160
- Measuring ranges 60 mbar…1600 bar
- Optionally available as S3 safety case according to EN 837-1

Mechanical measuring devices

HYGIENIC PRESSURE GAUGE BC4

With dry measuring system

Hygienic production processes place very high demands on the measuring devices used. Labom has expanded its portfolio with the BC4200, a pressure gauge that is particularly suitable for use in the pharmaceutical and food industries.

With fragile, hazardous and very expensive substances, it is often difficult to find a measuring device that fulfils all the applicable requirements in terms of hygiene, resistance and accuracy. The BC4200 pressure gauge satisfies all of these. It is what is known as a dry measuring system, with a flush-mounted diaphragm and all wetted parts made of 1.4435 (316L) stainless steel. The gauge can be integrated into production systems by numerous EHEDG-certified process connections for hygienic requirements and it is available in various hygienic versions.

A special option is the design of the mechanical pressure gauge with an electronic angle-of-rotation sensor and a 4...20 mA output signal (type series PL11), which enables remote transmission of the pressure values measured.

TO THE VIDEO

Various EHEDG certified process connections for hygienic applications

HIGHLIGHTS

- Pressure gauge with flush mounted diaphragm
- Dry measuring system
- All wetted parts of stainless steel 316L
- Various process connections for hygienic applications
- Suitable for CIP and SIP cleaning

Optional:

- Various hygienic designs according to EHEDG and ASME BPE
- Approvals / Certificates
  - Material certificate per EN 10204-3.1
  - Calibration certificate per EN 10204-3.1
  - Roughness height rating with inspection certificate acc. to EN 10204-3.1
- Output signal 4...20 mA with electronic angle-of-rotation sensor
- Accuracy class 1.0 per EN 837-1

Mechanical measuring devices

HYGIENIC PRESSURE GAUGE BH8

Autoclavable

Unique case design

BH8

one-piece design

The premium pressure gauge type BH8 HY, specially developed by Labom for pressure monitoring on mobile vessels in the pharmaceutical industry, is dead-zone free and suitable for sterilisation in autoclaves or by gamma sterilisation. The high-quality stainless steel case NS63 in hygienic design with extremely low surface roughness of Ra ≤ 0.76 µm, as well as the FDA-compliant, silicone-free pressure transmission fluid predestine the device for applications in the pharmaceutical / biotechnology and food technology. In the application for pressure monitoring of pharmaceutical mobile vessels, the device is characterised by a stable local display - possible temperature influences are almost completely eliminated by the reduced-volume measuring element.

NS 63

Multi-piece design

NS 100

Multi-piece design

Optional:

- Neck tube and diaphragm seal in a one-piece design
- Complete case including neck tube and diaphragm seal in an hygienic version Ra < 0.76 µm as per ASME BPE SF3 / EHEDG Doc. 8 available
- Damping of movement
- Precision scale

HIGHLIGHTS

- High-quality stainless steel case NS 63 / 100 with hygienic design in line with EHEDG recommendations
- Degree of protection IP 65
- Accuracy class 1.6 / 1.0 per EN 837-1
- Flush mounted diaphragm
- Small temperature error thanks to reduced-volume measuring element of stainless steel

DIAL THERMOMETERS

The sturdy

For outdoor use and agressive environments

FA8100

Bimetall thermometer
NS 50

FA2 / FA3

Bimetall thermometers

FN2 / FN3

Gas expansion thermomete

FN2 / FN3

Gas enpansion thermometer with capillary

FN2 / FN3

Gas expansion thermometer with clip-on bulb

HIGHLIGHTS

- High-quality bayonet ring case in NS 100 and NS 160
- Degree of protection IP 66
- Explosion protection for mechanical devices

- Case and wetted parts made of stainless steel
- Class 1 accuracy according to EN 13190
- Different connection types available

DIAL THERMOMETERS

With switch function

Simple, robust and reliable

SIL2

FP2400

FP2300

Bimetall thermometer

FU2 / FU3

Gas enpansion thermometer

FU2 / FU3

Gas expansion thermometer with capillary

HIGHLIGHTS

- High-quality bayonet ring case in NS 100 and NS 160
- Case and wetted parts made of stainless steel

- Switch function per DIN 16196:
  - Slow acting contact
  - Magnetic snap contact
  - Inductive contact devices

MADE TO MEASURE SOLUTIONS

THE NORTHERN GERMAN EXPERTS

As well as manufacturing standard equipment for the process industry, Labom is also an experienced specialist in measuring instruments that meet customers‘ individual specifications. Labom specialises in solving unusual measuring tasks and is more than happy to advise customers. Development, production and sales are located on the same site at its headquarters in Hude in northern Germany. The company‘s short lines of communication, large inventory and outstanding vertical manufacturing enables it to produce even small quantities of individual measuring instruments.

GET IN TOUCH WITH US!

Wir fertigen das richtige Messgerät für Ihre Anforderungen!

SELECTION

The Labom portfolio ranges from smart standard instruments, modular designed measuring systems and high-end measuring transmitters to custom configured measuring tasks.

STANDARDS

Labom is ISO 9001 certified. Our measuring equipment features certifications and approval according to recommendations by the relevant industry associations (EHEDG, Namur, etc.) Provisions based on guidelines for functional safety (SIL2) are considered in device development from the start.

INNOVATIONS

Labom solves individual tasks with innovative ideas, like in-process calibration of temperature measuring devices or socalled kombibar equipment with simultaneous electronic and mechanical pressure measurement.

QUALITY

Labom‘s quality management system is DIN EN ISO 9001: 2015-certified and complies with the Pressure Equipment Directive 2014 / 68 / EU and ATEX 2014 / 34 / EU.

Labom attaches importance to preserving the well-proven and combining this with the latest approaches.

In addition to a wide range of standard products, our strength lies in creating tailor-made solutions for our customers.

INDIVIDUAL DESIGNS ACCORDING TO YOUR WISHES

Labom‘s product catalogue is becoming more comprehensive every year – but we offer more than just the standard devices in the catalogue. You can also find customised solutions: together with our customers, our engineers develop temperature and pressure transmitters that are specially tailored to the customer’s own systems and requirements. Whether process connection, displays or measuring range: numerous features of the instruments can be individually adapted. Especially in the field of hygienic process connections, Labom has a wide range of options thanks to its many years of expertise. In addition to existing process connections, completely new, tailor-made connections can be created.

Should it happen that our portfolio does not contain the required options, it is most likely that we will develop a completely new device. We are happy to be inspired by our customers and together we will find new solutions that move the industry forward.

Special challenges such as unusual measuring ranges, extreme conditions or tricky questions inspire us – this is how we create new solutions made to measure together with our customers again and again!

KOMBIBAR SYSTEM

Labom realised for many customers tailor-made solutions for their very specific measurement tasks. One of the favorite solutions are „Kombibar“ devices: in one measurement point two different measurement methods are combined.

Typically, the “Kombibar” devices by Labom are equipped with a mechanical on-site indicator, which ensures permanent indication – quick and easy – and requires only one process connection. The pressure transmitter delivers highly precise data that can be recorded and analysed in the plant control system.

Using a corresponding adapter, a wide range of variations – also with additional features – can be realised. If required, further functions can be added such as an additional switch function for safety shut offs if a certain pressure limit is detected.

To meet hygienic requirements in the food industry the combination with hygienic diaphragm seals is possible. In paint shops the use of silicone free filling liquids have proven success and in gas and oil industry diaphragm seals suitable for high pressure peaks are the choice. For every measurement task a suitable combination can be found.

TWO IS SAFER THAN ONE

A customised solution was developed for an application in the food industry. The customer required a very special flange diaphragm seal connection for measuring pressure in its process, which no other manufacturer was willing to produce for them at that time. Another requirement was for redundancy of pressure measurement at its plant.

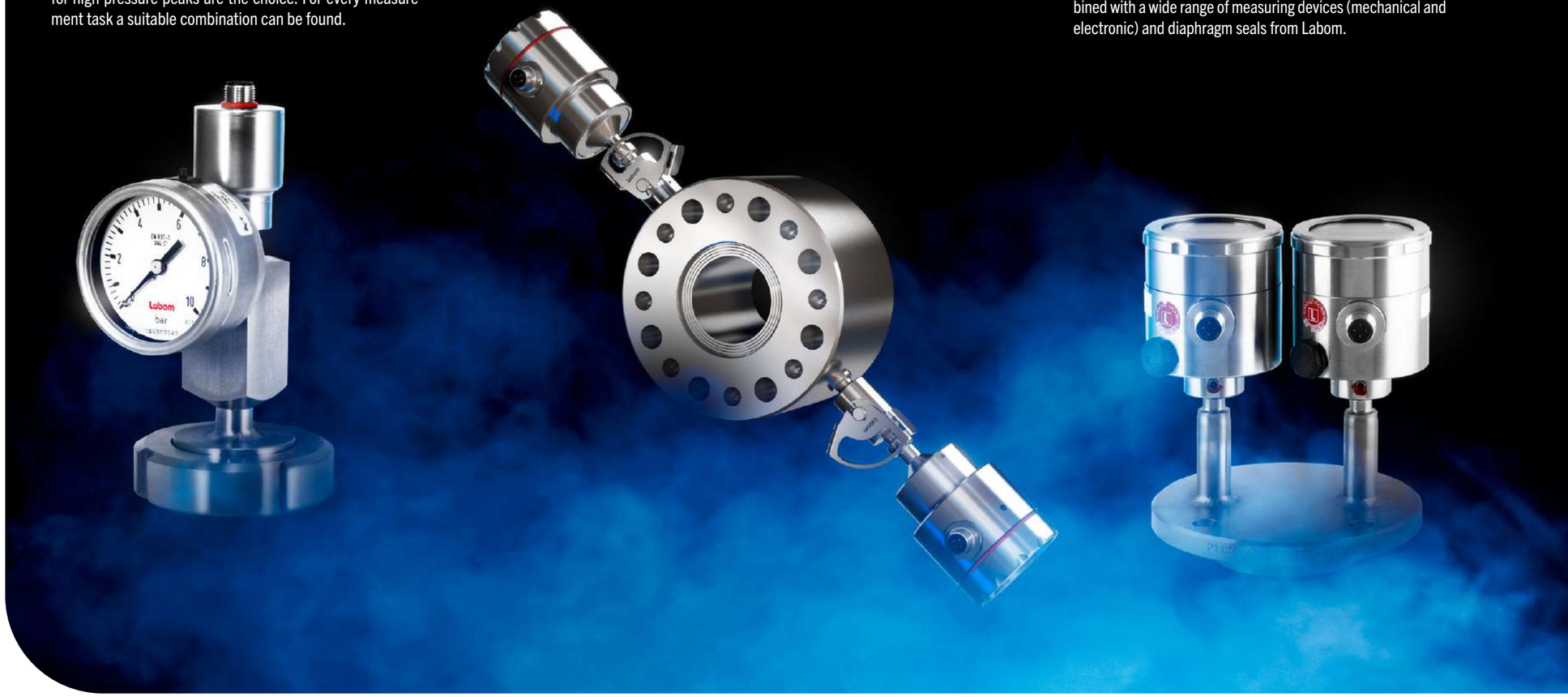
To solve this, Labom designed and manufactured a customised diaphragm seal for various nominal pipe sizes of 1“, 2“, 3“ and 4“, upon which two PASCAL CV4 pressure transmitters were connected to the process using a REconnect quick coupling. This meant that the pressure was measured at two points simultaneously, resulting in the system effectively checking itself. With REconnect quick couplings it is possible to easily and safely disconnect measuring devices without having to halt and open the process. In this way, one PASCAL CV4 transmitter could be disconnected from the system and recalibrated without pausing operation. While this is done the second transmitter continues to measure the pressure and transmit values to the system control unit. This ensures safe and continuous operation.

ONE PROCESS CONNECTION FOR TWO MEASURING RANGES

For an easy, safe and leakage-free separation of diaphragm seal systems, when it is necessary to replace or calibrate a measuring device, Labom has developed the REconnect quick coupling device and applied for a patent.

In particular, it facilitates the handling of measuring systems mounted with a capillary and in plants that are difficult to access. The process no longer needs to be opened, toxic or sensitive substances can neither enter nor exit.

The quick coupling consists of two parts that are easily separated with the help of a removable connecting bracket and can then each be covered with protective caps made of stainless steel. Operated by this special bracket, it makes safe decoupling of measuring device and process connection possible without affecting oil volumes and without loss of oil or intake of air. The quick coupling is vacuum-proof and has no parts that can be lost. It is suited to ex-protection and can be combined with a wide range of measuring devices (mechanical and electronic) and diaphragm seals from Labom.



OUR SERVICES

myLabom CUSTOMER PORTAL

Our myLabom customer portal provides many online functions related to your customer account. You can view and track your quotations and orders and all associated documents, including the current status of order processing and the tracking numbers of deliveries.

You can simply register using your customer number. You will have access to the portal as soon as your data is verified. After activation you can access your personalised content and keep yourself informed at all times.

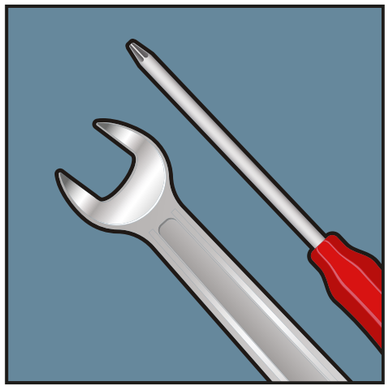
Register now!

MEASURING POINT EVALUATION

Together with you we would be glad to evaluate the installed pressure and temperature measurement instruments on site concerning maintenance and repair needs.
We offer following technical support:

- Functional Testing
- Cleaning
- Hardware or Software Update
- Exchange wear and tear parts
- Calibration after Repair

If on site repair and maintenance work is required please contact us to discuss all possibilities.

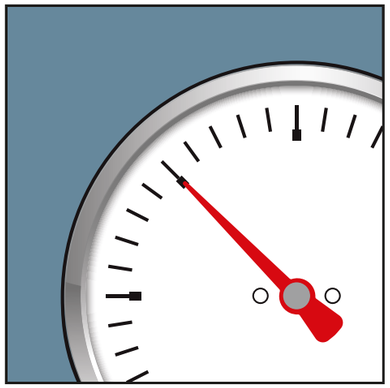


CALIBRATION SERVICE

Measuring instruments must be calibrated regularly to avoid measurement errors and to ensure the safety of production processes and product quality. Labom provides a calibration service either within the factory in Hude or on site. We provide calibration certificates according to EN 10204 3.1.
Following variables can be calibrated:

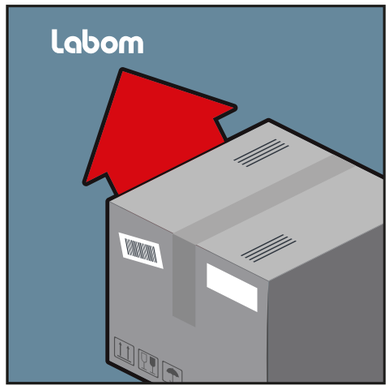
- Pressure
- Temperature
- Current
- Voltage
- Resistance
- Speed

If you want to send us your devices for calibration please use our return shipment form. If you prefer an on-site calibration please contact us to discuss all possibilities.



RETURN SHIPMENT

Return shipment of devices for calibration, repair or maintenance or of test resp. sample instruments, please fill out our Return Shipment / Declaration of Contamination form. Please answer the questions regarding a possible contamination of the equipment for your and our security with the utmost care. The completed form must be attached to the outside of the packaging or sent in advance by email to returns@labom.com.

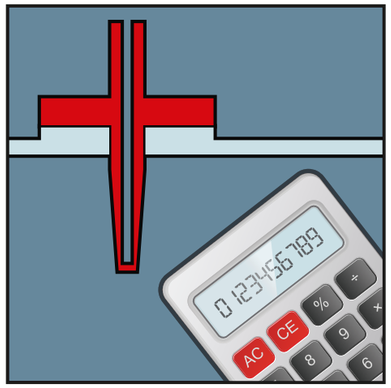


OUR TOOLS

THERMOWELL CALCULATION

Labom thermowells are manufactured in accordance with national standards (DIN 43772) or customer specifications.

The corresponding Labom dial thermometers and temperature sensors have been specially designed for optimal compatibility. Typically thermowells are used in applications where they are to remain in the measured media and only the temperature sensor will be exchanged or retrofitted, or where the temperature sensor must be kept out of direct contact with the product. Thermowells also provide protection against mechanical loads.
As part of our services, we are pleased to offer calculation and analysis of the thermowells to mathematically determine the strength in respect to the static and dynamic load in the individual application.

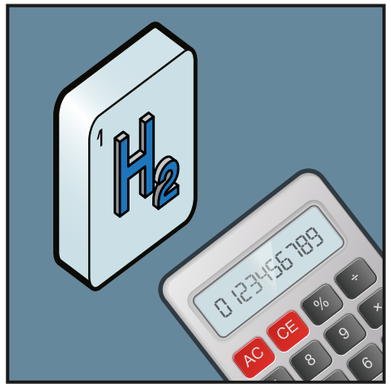


HYDROGEN TOOL

Hydrogen penetrates stainless steel. This effect can have negative influences on the function of measuring instruments. With our hydrogen tool, we can calculate the time period in which this effect is reliably excluded for measuring instruments with diaphragm seal systems, depending on the most important influencing factors.

On our homepage you find our tool for the Calculation of the hydrogen resistance of measuring instruments.

For an individual calculation request please use our contact form and we will calculate your application and can provide you with a scientifically based result or in case of an order you can receive an H2 resistance certificate.



Labom
Mess- und Regeltechnik GmbH

Im Gewerbepark 13
27798 Hude
Germany

Phone +49 4408 804-0
info@labom.com
www.labom.com