

# Measurement Solutions for Pharmaceuticals and Health



- °C
- g/m<sup>3</sup>
- °Ctw
- %RH
- °Ctd
- Lux
- pH
- inch H<sub>2</sub>O
- ppmV
- CO<sub>2</sub>
- Nm<sup>3</sup>/h
- hPa
- m/s
- td



# Exactly the right instrument for every application.

Whether in laboratories, cleanrooms, storage, transport or the health sector:  
With Testo solutions you are always on the safe side!





The ambient conditions in the production and storage of medicaments, vaccines or blood products must be continuously monitored and documented. The measurement data monitoring system testo Saveris™ (fig. left) automates temperature and humidity monitoring.

Pharmaceutical products must be of impeccable quality. This applies in the research and development of medications just as in the storage of sensitive substances in hospitals and large dispensaries. Various measurement parameters such as temperature and air humidity must be monitored, controlled and documented.

You know the demands placed on measurement technology all too well. You know that the monitoring and documentation of climate data is prescribed. Pharmaceutical guidelines such as the Good Manufacturing Practice (GMP) form the basis for this, and place the emphasis on conformity, traceability and reliability.

Measurement solutions from Testo AG are optimized regarding security and productivity. Our products correspond to the respective national and international standards, guidelines and hygiene regulations. Thanks to numerous technical innovations, they provide you with new opportunities for more flexibility and cost reduction.

Our own research activities, worldwide cooperation with universities, and involvement in internationally recognized committees are the guarantee for technical innovations. Testo Industrial Services GmbH supports you with services such as the qualification and validation of pharmaceutical systems and cleanrooms, as well as with certified calibrations. Test Testo!

*The information service IMS Health forecasts a worldwide turnover in pharmaceuticals of almost 1.1 trillion dollars for the years up to 2015, which corresponds to an annual growth of 3 to 6 percent. While North America, Europe and Japan are under average, two-figure growth rates are expected for the emerging nations. Globalized sectors need partners with international know-how. With over 30 subsidiary companies worldwide, Testo AG is a guarantee for customer proximity and quality.*

**Testo measurement technology offers you:**

- Measuring instruments which comply with the HACCP stipulations and the pharmaceutical GMP guidelines
- Validatable software solutions which are adapted to the requirements of FDA 21 CFR Part 11
- Comprehensive range of products
- Large selection of cable-connected and wireless, calibratable and exchangeable probes

## More security and productivity.

Testo measuring instruments support the search for optimum laboratory results.



*In terms of investment, pharmaceuticals and biotechnology have the second-largest growth potential after the transport and automotive industry. This is the result of a study by Ernst & Young. According to this study, China leads the ranking of investment countries, followed by India, the USA and Brazil. At fifth place, Germany is the most attractive European country. The practice-oriented measurement solutions from Testo AG are designed to meet the strict demands of pharmaceutical companies worldwide.*

Secure laboratory results can only be achieved with outstanding products. This also applies to measurement technology. Whether for long-term or spot-check measurements, for measurement parameters such as temperature, humidity or pH value: Testo AG offers you GMP and FDA compliant high-tech solutions – worldwide. Robust, easy-to-operate and easy-to-clean instruments with a high level of protection from water splashes and dust. Calibratable probes for long availability in tough sterile surroundings. Protective covers for portable instruments additionally make sure that splashes of solvents, dirt or impact cannot cause damage.

The one-hand measuring instrument testo 206, for example, is designed for fast pH checks in liquids and semi-solid media. It stands out due to its combination of a pH immersion probe and a temperature probe for precise temperature compensation. The measurement data monitoring system testo Saveris™ monitors the climate in refrigerated rooms and deep-freezers as well as the room climate. It transfers the measured values automatically by wireless or Ethernet to the Saveris base station.

**Your Testo advantages in laboratories:**

- Fully automatic measurement and recording of measurement data, fully automatic report generation and alarms when limit values are exceeded
- Robust measuring instruments for tough surroundings with high IP protection classes and protective covers
- Portable multi-function instruments with a broad range of probes for all relevant parameters in climate measurement (including temperature, humidity, pressure, light intensity, CO<sub>2</sub> and much more)
- Data loggers for temperature, humidity and pressure



**Measurement data monitoring system**  
testo Saveris™



The pH value is probably the parameter most often measured in aqueous solutions. This is why robust, precise measurement technology, as offered for example by the pH/temperature measuring instruments from the testo 206 series (fig. centre), is so important.

## Quality without compromise.

Testo products for cleanrooms measure quickly, precisely, continuously and automatically.

The prerequisite for numerous pharmaceutical applications is a controlled production environment. Contamination must be avoided, the end product must be free of pollution by dust. Cleanrooms offer a clean, sterile environment and constant climatic conditions. Temperature, humidity, air volume flow and pressure cascades to the outside rooms can be precisely adjusted.

As a cleanroom, air conditioning or ventilation technician, you are responsible for the adherence to the GMP guidelines. Part of your job is the optimum configuration of the systems. Because of the stringent hygiene requirements, you need measuring instruments which measure highly accurately and reliably.

In demand are robust solutions which can be cleaned easily and are hygienically designed.

The multi-function measuring instrument testo 480 is the first choice for the installation and commissioning of ventilation systems. It supports the standard-compliant adjustment of the systems and records all the relevant parameters in ambient air measurements. The cleanroom-conform differential pressure transmitter testo 6383 in panel design is installed in the wall, so that its surface is flat.

The stationary transmitter testo 6351 regulates and monitors the differential pressure. It additionally calculates the measurement parameters volume flow and flow velocity. In combination with the measurement data monitoring system testo Saveris™, the measurement values are recorded, forwarded, centrally documented and compiled into clear reports. All fully automatically.



**Differential pressure transmitter**  
testo 6383

### **Your Testo advantages in production and cleanrooms:**

- Monitoring and documentation of various measurement parameters
- Cleanroom-conform measurement technology without edges and corners
- Standard and special transmitters for the highest accuracies, with a broad range of calibratable, exchangeable probes.



The lowest differential pressures between different rooms or zones must be maintained. The differential pressure transmitter testo 6381 (fig. right) stands out thanks to advantages such as an automatic zero-point adjustment and an integrated self-monitoring and early warning function. The multi-function measuring instrument testo 435 (fig. centre) is designed among other things for degree of turbulence measurements, and calculates parameters such as volume flow and flow velocity.



*In cleanroom areas, defined pressure differences between cleanroom zones ensure optimum conditions. Special pressure concepts guarantee the air stays pure and prevent cross-contamination. In order to maintain the hygiene conditions, the differential pressures must be continuously measured and regulated.*



*Supply Chain Managers in pharmaceutical and biotech companies as well as in medicinal product manufacturers in the USA, Europe and Asia are concerned about their supply chains. That is the result of a survey by the market research company TNS UK Ltd. The greatest difficulties reported by the respondents were presented by the maintenance of legal stipulations (73 percent), followed by cost management in the supply chains (64 percent). As a result of cost and competition pressure, and due to imminent health reforms, 86 percent of managers intend to invest in new technologies in the next three to five years.*

### **Your Testo advantages in storage and transport:**

- Fully automatic recording and documentation of all climate data
- Flexibly extendable measurement data monitoring system
- Easily operable and configurable data loggers for the parallel monitoring of temperature, humidity and pressure, e. g. for the purposes of recording data over the entire duration of the transport

## Grow with the job.

Multi-function measuring instruments from Testo AG have all storage climate measurement parameters under control.

Many raw materials, intermediate and end products are temperature and humidity-sensitive. Their storage site may be neither too warm nor too cold, neither too dry nor too humid. Companies which work according to the GMP guidelines are additionally required to record and to provide traceable documentation of temperature and humidity values.

In order to eliminate the danger of damage to medicaments, you also adhere strictly to the prescribed temperatures for storage. And in addition to this, increased productivity is only possible when you automate measurement data recording.

testo Saveris™ was designed for exactly this purpose. When adjustable upper or lower limit values are exceeded, the system provides audible or optical alarms by SMS or e-mail. It grows with the job. The wireless and Ethernet probe network can be extended almost unlimitedly.

Our data loggers such as the testo 175 T1 are as handy as they are user-friendly and reliable. They are the perfect companion for temperature, humidity and pressure monitoring, not only during transport. The lightweight instruments are configured by software. A special FDA 21 CFR Part 11-compliant software meets the requirements of the pharmaceutical sector.



**Temperature data logger**  
testo 175 T1



The logistics of companies in the pharmaceutical industry must be traceable and fulfil prescribed quality standards. The measurement data monitoring system testo Saveris™ provides a quick overview of all measurement sites, saves time thanks to automated and central documentation, and offers security with alarms when limit values are exceeded.

## Identify risks, use opportunities.

Testo solutions automate measurement data monitoring in clinics and hospitals.

*Among the advantages of the measurement data monitoring system testo Saveris™ are the automated monitoring of measurement parameters such as temperature and air humidity, the different alarm options (audible, optical, SMS, e-mail), as well as the possibility of recording and centrally documenting measurement data over large distances. The broad range of probes covers a temperature range from minus 200 degrees Celcius to more than plus 1000 degrees Celcius. The Saveris software is available in three different versions. The validatable CFR version fulfils the requirements of the FDA 21 CFR Part 11.*



In many different areas of clinics and hospitals, appropriate climatic conditions must be ensured. For example, comfort criteria must be maintained in summer (room temperature) just as in winter (room air humidity). Multi-function measuring instruments such as the testo 435 (fig. centre) are efficient, reliable partners for evaluating indoor air quality.

Whether in clinic laboratories, blood banks, in operating theatres or in hospital dispensaries: quality, safety and efficient processes are central requirements in the health sector. The continuous monitoring of ambient values and other measurement parameters is therefore of great significance for you as the person responsible for processes or quality. With the standard-compliant Testo solutions, you have all important measurement parameters under control.

Multi-function measuring instruments such as the testo 435 keep a close eye on indoor air quality. The portable, universally applicable temperature measuring instrument testo 925 is similarly versatile. With the broad range of probes for process tests and spot-check measurements, for air,

penetration and surface measurements, you monitor difficult-to-access sites as well as exhaust gases or ambient temperature. The measurement data monitoring system testo Saveris™ automates the monitoring of ambient conditions. Transmitters for many different measurement parameters can furthermore be integrated into the system. For example, by including our humidity transmitters testo 6651 and testo 6681, measurement data monitoring is possible parallel to the control. This allows solutions for the highest level of accuracy to be realized in areas of application such as air conditioning technology and cleanrooms.



**Measurement data monitoring system**  
testo Saveris™



**Humidity transmitter**  
testo 6681

**Your Testo advantages in the health sector:**

- Multi-function measuring instruments with a large storage capacity and an extensive selection of probes for indoor air quality and comfort measurements
- Monitoring system for various measurement parameters with a broad range of probes, different alarm options and fully automatic report creation

# Quality is measurable.

Take a look at the Testo world of measurement. Here is a small product selection for the field of pharmaceuticals and health.

**Measurement data monitoring system**  
for the continuous monitoring of temperature and humidity

testo Saveris™

The intuitively operated measurement data monitoring system testo Saveris™ measures the temperature and humidity values of sensitive goods and products in the environment, in processes and during transport.



## Laboratories



**One-hand pH / temperature measuring**  
for application in liquid and semi-solid media

testo 206-pH2

The instruments of the testo 206 series stand out thanks to their combination of a pH immersion tip and a temperature probe for precise and fast temperature compensation.



**Pressure/temperature/humidity data logger (5-channel)**  
with internal and external sensor connection

testo 176 P1

In addition to an internal absolute pressure sensor, the testo 176 P1 has connection possibilities for two external humidity probes, allowing the ambient conditions to be monitored extremely accurately.



**Differential pressure transmitter**  
in cleanroom-conform panel design

testo 6383

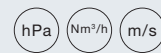
The testo 6383 was specially designed for the monitoring of low differential pressures. Among other features are the measurement of humidity and temperature (optional), an accuracy of  $\pm 0.3\%$  of the measuring range final value, automatic zero-point adjustment and self-monitoring function.



**Differential pressure transmitter**  
with humidity/temperature option

testo 6381

In order to keep cleanroom conditions constant, the transmitter testo 6381 also calculates the parameters volume flow and flow velocity from the measured differential pressure. Thanks to an optional measurement probe, the simultaneous recording of humidity and temperature in one instrument is possible.



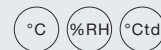
## Production & cleanrooms



**Humidity transmitter**  
for critical climate applications

testo 6651

In combination with the probe series testo 660x, the testo 6651 is the first choice in demanding air conditioning technology, in cleanrooms and in numerous other areas of application.



**Temperature data logger (1-channel)**

for long-term temperature monitoring

testo 175 T1

The EN 12830-compliant data logger testo 175 T1 is ideally suited to the monitoring of refrigerated and deep-freeze rooms and to the documentation of transport temperatures. The large memory for 1 million measurement values allows infrequent readout.



**Humidity/temperature measuring instrument**

with integrated humidity probe head

testo 625

For measurements in areas that are hard to reach, the integrated humidity probe head can simply be removed and placed on the handle with the probe line (accessory) for measurements of air humidity and temperature.

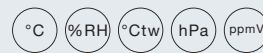


**Humidity transmitter**

for air conditioning technology and other applications

testo 6681

The testo 6681 has additional features such as an optimized adjustment concept and interfaces for the integration into individual automation systems. Self-monitoring and early warning guarantee high system availability.



**Temperature measuring instrument (1-channel)**

for fast and reliable measurements in the HVAC field

testo 925

The testo 925 is ideal for connecting rapid, reliable thermocouple probes. With measurement data transfer by radio, the measurement value of a further temperature probe can be displayed wirelessly.



**Storage & transport**



**Temperature and humidity data logger (2-channel)**

with external humidity sensor

testo 175-H1

The testo 175 H1 continuously records temperature and humidity values and, if required, displays the dewpoint in addition to the temperature and humidity.



**Health sector**



**Thermal imager**

for even more precise thermal images

testo 882

Anomalies and weak spots are detected by the thermal imager testo 882 even from a great distance. With 76,800 temperature measuring points, it sees every detail on the measured object.

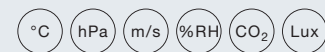


**Climate measuring instrument**

with intelligent calibration concept

testo 480

The high-end climate measuring instrument testo 480 and its digital probes measure parameters such as flow velocity, temperature, humidity, pressure, light intensity, radiant heat, degree of turbulence and CO<sub>2</sub> absolutely securely in one instrument.



# The essence of precision.

On the job for you worldwide.



The requirements for practical measurement solutions are becoming increasingly more complex and customized. At Testo we have made it our business to recognize these customer requirements in industry and trade, and to translate them permanently into new technologies. We carry out our own intensive research, and for decades have been at the cutting edge of the market. Real innovations in sensor systems as well as advances made in microelectronics, measurement data storage or communication with other media such as PCs and portable terminals benefit all Testo customers.

### Competent service

Testo offers professional and reliable consultation for all questions pertaining to measuring technology. We provide users quick assistance also after the purchase is made – worldwide.

### Research and Development

Testo invests roughly 10 percent of turnover in Research and Development annually. Staff from many different disciplines such as physics, chemistry, biology, electrotechnology and process technology conduct applied research in sensor and measurement technology. Testo maintains international cooperation with universities and research institutes, and is represented in a number of committees which are concerned with innovative measurement technology for various fields.



### Certified reliability

Quality assurance allows no leeway. Testo Industrial Services offers accredited calibrations for portable and stationary measurement technology. The calibrations take place in Testo's own accredited high-tech laboratories at our facility, or directly on site at the customer's business. For the purposes of adherence to GMP, you are offered services for validation and qualification.





**Worldwide presence**

Climate protection, energy efficiency, legislation and guidelines are of global significance. Testo provides constant support with expert competence. For us, what counts is being close to the customer and supporting him on site. We achieve this with 31 subsidiaries worldwide and over 80 distribution partners. Testo is represented all over the world with more than 2300 employees.

Our customers worldwide rely on Testo's 50 years of experience and quality.

