

Be sure. **testo**

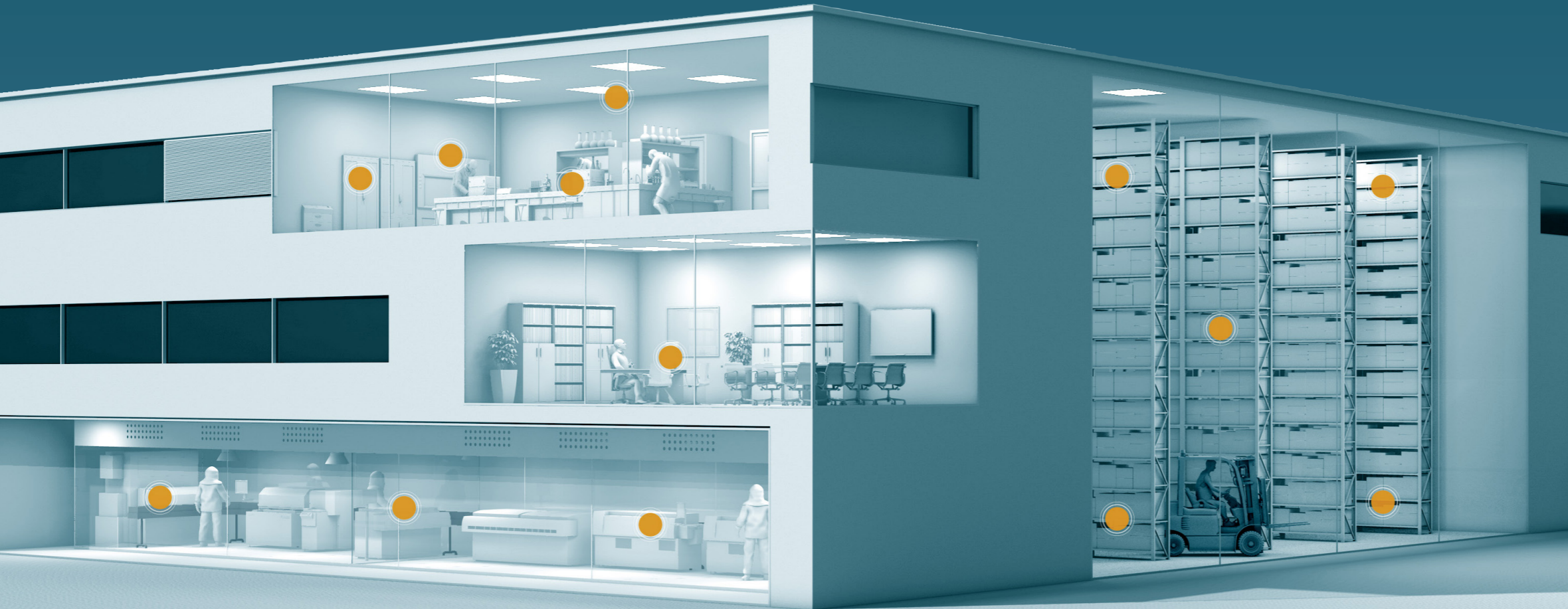


# Environmental monitoring system **testo Saveris 1.**

The comprehensive solution for your data monitoring.  
Hardware, software and services: All from one source

## testo Saveris 1: All the information at a glance – using just one system.

The all-in-one solution testo Saveris 1 was designed and implemented in collaboration with experts from industry as well as research and development. High-precision measurement technology, intuitive software and comprehensive services will help you to do your job quickly, efficiently and in compliance with current regulations



### Get an overview of the entire process.

- ☑ Minimize risks and reduce costs to make your manufacturing processes more efficient.
- ☑ Access all your data on any platform, from anywhere and at any time.
- ☑ Use the recorded data for process analysis and optimization.

### Achieve greater efficiency.

- ☑ Record the quality data for all key environmental parameters – digitally and paper-free.
- ☑ Record and document all relevant quality data for a variety of applications.
- ☑ Access your data at any time – and always be ready for your next audit.

### Identify critical points.

- ☑ Detect faults early on and take corrective action.
- ☑ Use intelligent alarm functions for fast action.
- ☑ Identify potential issues before they even occur.

### Have everything under control.

- ☑ Meet the high quality standards that are in force for your application.
- ☑ Strengthen quality awareness in your organisation and among your partners.
- ☑ Gain full control over the quality of individual areas of responsibility.

And for your next audit: **Be sure.**

# testo Saveris 1: Areas of application for the Solution

## Research & Development

In medical, biotechnical, chemical and pharmaceutical laboratories and cleanrooms, important climatic parameters have to be monitored. This is the only way to maintain a high standard of quality while creating traceability.

Temperature in particular is a critical parameter that must be controlled and monitored. Humidity and pressure must also be included in standard-compliant IAQ monitoring.

Our solution offers reliable, automated and continuous measurement of the relevant environmental conditions for almost any laboratory application, and therefore supports compliance with various internationally applicable quality standards such as Good Laboratory Practice (GLP) or DIN EN ISO 17025 and DIN EN ISO 15189.

Monitoring of environmental conditions in indoor areas:

- (Research) laboratories
- Cleanrooms
- Facilities for animals
- Greenhouses
- Stability test chambers
- Biobanks
- Blood and tissue banks

Monitoring the temperature and humidity of equipment:

- Refrigerators, freezers, ultra-low temperature freezers, liquid nitrogen applications
- Other laboratory equipment such as water baths

## Storage & Logistics

In the general storage and logistics of goods of any kind, minimum standards are often required when it comes to temperature monitoring. This applies to the pharmaceutical industry and medical technology as well as to the food sector or logistics and industrial companies in general. The reason: Monitoring is the only way to ensure that the quality and safety of products are not jeopardized.

At Testo, not only do we supply you with the system, we also provide full support when it comes to calibration, mapping, qualification and validation in the following application areas:

- Warehouses and distribution centres
- Receipt of goods
- High-bay warehouses
- Cold stores
- Refrigerators, freezers, ultra-low temperature freezers, liquid nitrogen applications

## Production

If temperature-sensitive goods such as pharmaceuticals, foodstuffs or lithium batteries are produced and stored under the wrong climatic conditions, the quality and stability of the products can suffer. In most cases, internationally valid minimum standards stipulate that the relevant areas are qualified and the environmental conditions are monitored and documented in a manipulation-proof way.

testo Saveris 1 offers an all-in-one solution consisting of hardware, software and all-encompassing GxP services for the following applications:

- Cleanrooms
- Production
- Aseptic filling
- Packaging
- Interim and final storage of APIs, excipients and finished products

The validatable environmental monitoring system corresponds to the ERES principle (Electronic Records, Electronic Signatures), and is thus compliant with the stipulations of 21 CFR Part 11 for automated systems.

## Health sector

In healthcare, environmental measurement solutions are used in many different areas to ensure patient safety and to reduce the risk of product losses and compliance violations. Whether in hospital operating theatres and treatment rooms to monitor medications, in a blood and tissue bank to protect samples, or in an in-house pharmacy where sensitive medications are manufactured and stored.

Monitoring of environmental conditions in indoor areas:

- Hospitals
- Laboratories
- Operating theatres
- Treatment rooms and patient wards
- Pharmacy
- (Cold) storage
- Cleanrooms
- Blood and tissue banks

Monitoring the temperature and humidity of equipment:

- Refrigerators, freezers ultra-low temperature freezers, liquid nitrogen applications
- Incubators



# testo Saveris 1: System overview

## Communication modules

The use of different communication technologies with the testo 150 data logger modules is permitted. Depending on the application, you can either use an existing infrastructure (WLAN or Ethernet) or the **testo UltraRange** long-range radio technology.

With this innovative product, you have the option of using an autonomous radio network via encrypted, proprietary signals, which has an excellent range and signal stability for use in enclosed spaces.

More information on page 10

## Analog coupler and connection box for external probes

In addition to temperature and humidity, other measurement parameters such as differential pressure can be integrated into the testo measurement data monitoring system.

For example, all transmitters with standardized current and voltage inputs can be integrated.

More information on page 14

## testo Saveris Base V 3.0

The core component of testo Saveris manages measurement data from up to 3,000 channels, evaluates it and generates alarms if any limit value violations should occur.

More information on page 8

## Alarms via testo Saveris 1:

- by e-mail
- by SMS
- decentralized alarms (http signal), e.g. alarm light, Teams message, relay

API

## REST API

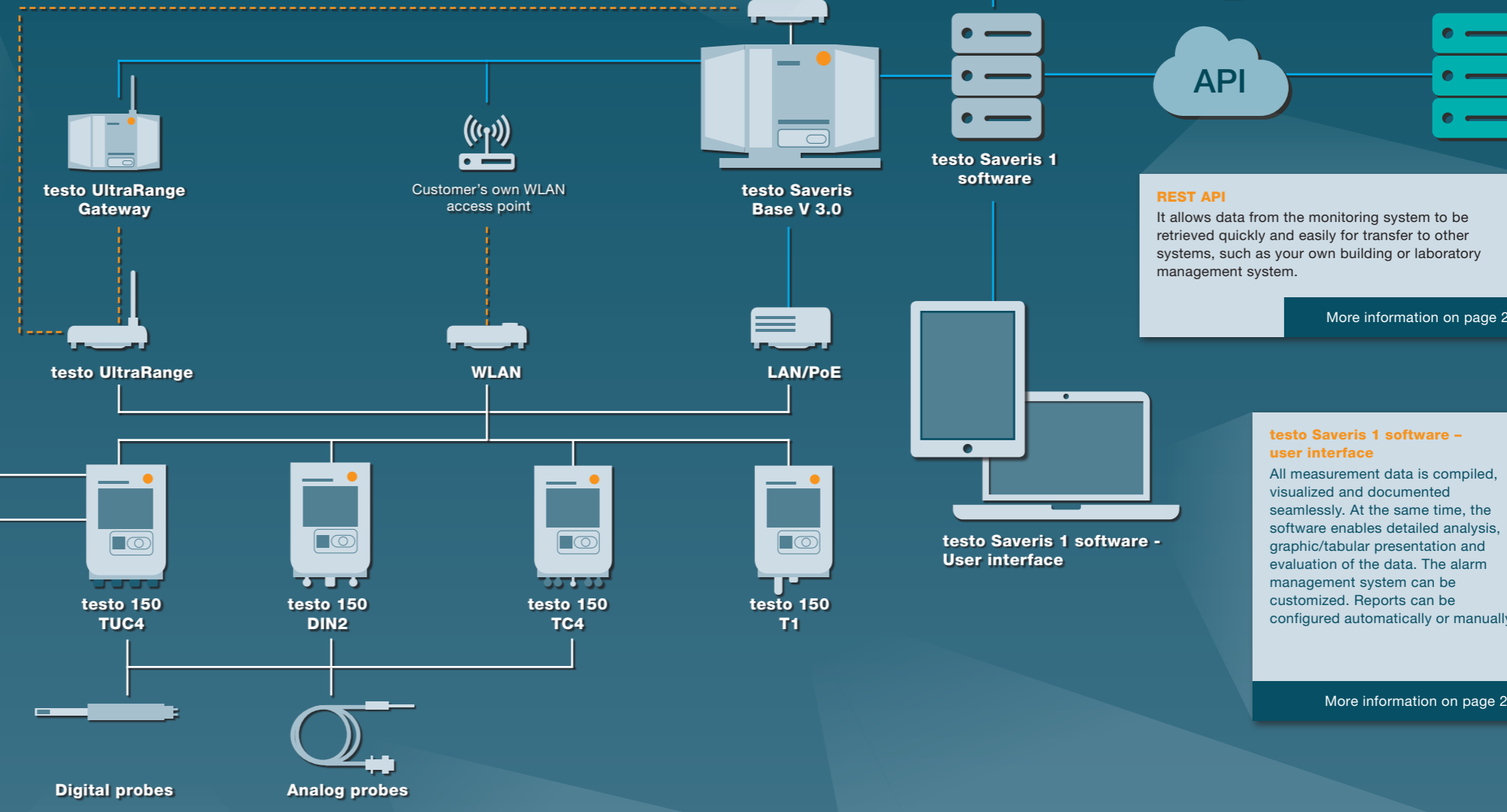
It allows data from the monitoring system to be retrieved quickly and easily for transfer to other systems, such as your own building or laboratory management system.

More information on page 20

## testo Saveris 1 software - user interface

All measurement data is compiled, visualized and documented seamlessly. At the same time, the software enables detailed analysis, graphic/tabular presentation and evaluation of the data. The alarm management system can be customized. Reports can be configured automatically or manually.

More information on page 20



## Transmitter

### testo 6681 with probe:

Humidity and temperature measurement for special applications (high humidity / trace humidity / challenging measurement environments, e.g. H<sub>2</sub>O<sub>2</sub>)

### testo 6383

High-precision differential pressure measurement in clean room applications (transmitter in flush design, optional combination of differential pressure, humidity and temperature)

For more information, please get in touch with your contact partner.

## Digital probes

High-precision measurements for quality-relevant parameters in a regulated environment. It is not necessary to interrupt the measurement to calibrate the probes – they are replaced during operation. There is no need to remove the data loggers and there are no gaps in the measured values.

More information on page 16

## Analog probes

Almost every possible temperature measurement scenario is covered:

### NTC resistance probes

are exceptionally robust and reliable

### Platinum resistance probes

(PT 100) are used for measurements in a wider temperature range

### Thermocouples

are used primarily in industry because of their wide measuring range and comprehensive selection of sensors.

More information on page 18

## testo 150 data logger modules

Safe, simple and efficient monitoring of critical environmental parameters in accordance with the strictest guidelines.

### testo 150 TUC4

(four connections for digital sensors): Probe replacement and calibration during ongoing operation, independent of the data logger module.

### testo 150 TC4

(four connections for thermocouples): Ideal for industrial applications and measurement of extreme conditions.

### testo 150 DIN2

(two connections for standard probes): Enables use of the Testo probe portfolio covering all applications.

### testo 150 T1

(internal sensor): Built-in NTC temperature sensor for temperature monitoring

More information on page 10

# Base station and Gateway

## testo Saveris Base V3.0 testo UltraRange Gateway



- Automated, uninterrupted, no-loss storage of measurement data
- The testo Saveris Base V3.0 can manage up to 3,000 measurement channels
- Comprehensive alarm management
- Alarms in the event of limit value violations as per GxP specifications

testo Saveris Base V3.0 is the core component of the testo Saveris 1 environmental monitoring system. It manages measurement data from up to 3,000 channels, evaluates it and generates alarms if any limit value violations should occur.

The built-in emergency battery guarantees maximum data security, even in the event of a power failure. The system alerts you visually, as well as via e-mail and SMS.

Optionally, further optical and acoustic signalling devices can be connected via an alarm relay.

Besides Ethernet and WLAN, the testo Saveris 1 environmental monitoring system also supports testo UltraRange long-range radio technology. In addition to using an existing infrastructure, this also offers the option of using an autonomous radio network via encrypted, proprietary signals, which has an excellent range and signal stability for use in enclosed spaces.

**!** **Note: For technical data on the Base station and Gateway, please see page 24**

# Order data

### testo Saveris Base V3.0

testo Saveris Base incl. rechargeable battery and configuration cable.  
Caution: Communication modules and mains units are not included in delivery.



Order no. 0572 9320

### testo UltraRange Gateway

Gateway for testo UltraRange radio connection incl. configuration cable.  
Caution: Communication modules and mains units are not included in delivery.



Order no. 0572 9310

# Accessories

Accessories for testo Saveris Base V3.0 and testo UltraRange Gateway		Order no.
Tabletop stand		0554 7200
Mains unit with USB cable		0572 5004
testo UltraRange communication module (region EU)		0554 9311 02
testo UltraRange communication module (region US)		0554 9312 02
testo UltraRange communication module (region CN)		0554 9313 02
testo UltraRange communication module (region APAC*)		0554 9314 02
testo UltraRange communication module (region KR)		0554 9315 02
testo UltraRange communication module (region IN)		0554 9316 02
testo UltraRange communication module (region RU)		0554 9317 02
*Japan, Malaysia, Singapore, Taiwan, Macau		
Accessories for testo Saveris Base V3.0		Order no.
Spare rechargeable battery		0515 5107
LTE stick (EMEA)		0554 7214
LTE stick (Americas)		0554 7211
LTE stick (APAC & Australia)		0554 7212
External antenna for LTE stick		0554 7234
Alarm module (optical & audible)		0572 9999
	for operation: 24V mains unit 0554 1749 required	
Programmable signal lamp (can be used from Saveris 1 V5.3 onwards)		8793 0040

# Data logger modules for monitoring environmental parameters

## testo 150



- Automated, uninterrupted, no-loss recording of measurement data - even in regulated environments
- Can be combined with Testo communication modules for measurement data transmission via WLAN, Ethernet or testo UltraRange technology
- Reliable alarm system & comprehensive documentation
- Efficient monitoring by connecting up to four sensors
- Certified according to DIN EN 12830:2018
- In the event of any limit value violations, alarms on the logger itself

The four testo 150 data logger modules are part of the testo Saveris 1 environmental monitoring system and they enable safe, simple and efficient monitoring of critical environmental parameters in accordance with the strictest guidelines.

- **testo 150 TUC4** (four connections for digital sensors): Probe replacement and calibration during ongoing operation, independent of the data logger module.
- **testo 150 TC4** (four connections for thermocouples): Ideal for industrial applications and measurement of extreme conditions.
- **testo 150 DIN2** (two connections for standard probes): Enables use of the Testo probe portfolio covering all applications.
- **testo 150 T1** (internal sensor): Built-in NTC temperature sensor for temperature monitoring

All data logger modules alert you to limit violations via the measurement data management software, testo Saveris 1 software and the testo Saveris Cockpit.

Thanks to their modular design, the testo 150 data logger modules can be integrated into any existing communication infrastructure (WLAN, LAN). The optional testo UltraRange long-range radio technology also enables the autonomous and secure transmission of readings over long distances.

**! Note: Technical data can be found on page 22**

## Order data

<p><b>testo 150 TUC4</b></p> <p>Data logger module with display and 4 connections for all Testo sensors with TUC (Testo Universal Connector). Incl. wall bracket, batteries and calibration protocol.</p> <p>Order no. 0572 3320</p> <p><b>DIN</b> EN 12830:2018</p>	<p><b>testo 150 DIN2</b></p> <p>Data logger module with display and 2 connections for temperature sensors with miniDIN connector. Incl. wall bracket, batteries and calibration protocol.</p> <p>Order no. 0572 3340</p> <p><b>DIN</b> EN 12830:2018</p>
<p><b>testo 150 TC4</b></p> <p>Data logger module with display and 4 connections for thermocouples. Incl. wall bracket, batteries and calibration protocol.</p> <p>Order no. 0572 3330</p> <p><b>DIN</b> EN 12830:2018</p>	<p><b>testo 150 T1</b></p> <p>Data logger module with display and 1 internal NTC temperature sensor. Incl. wall bracket, batteries and calibration protocol.</p> <p>Order no. 0572 3350</p> <p><b>DIN</b> EN 12830:2018</p>

## Accessories

Accessories	Order no.
L91 Energizer batteries	0515 0572
Mains unit & USB cable for testo 150	0572 5004
4 x AIMn battery LR 6 (alkaline manganese AA batteries)	0515 0414
Magnetic attachment for testo 150 wall bracket	0554 2001
Stand - for testo 150 data loggers	8793 0036
Communication modules	Order no.
LAN / PoE communication module	0554 9330
WLAN communication module	0554 9320
testo UltraRange communication module (region Europe)	0554 9311 01
testo UltraRange communication module (region Americas)	0554 9312 01
testo UltraRange communication module (region China)	0554 9313 01
testo UltraRange communication module (region APAC*)	0554 9314 01
testo UltraRange communication module (region South Korea)	0554 9315 01
testo UltraRange communication module (region India)	0554 9316 01
testo UltraRange communication module (region Russia)	0554 9317 01

\*Japan, Malaysia, Singapore, Taiwan, Macau

# Communication modules for testo 150, testo Saveris Base V3.0 and testo UltraRange Gateway



Modular components for communication via WLAN, Ethernet and testo UltraRange (radio)

testo UltraRange technology: Very high radio range and signal stability compared with conventional radio technologies

International radio authorizations

Can be freely combined with all testo 150 data logger modules for maximum scope of application

Easy installation, maintenance and commissioning

The communication modules enable the use of a wide range of communication technologies with the testo 150 data logger modules. Depending on the application, you can either use an existing infrastructure (WLAN or Ethernet) or use the testo UltraRange long-range radio technology.

With this innovative product, you have the option of using an autonomous radio network via encrypted, proprietary signals, which has an excellent range and signal stability for use in enclosed spaces.



**Note: Technical data for the modules can be found on page 23**

## Order data

### LAN/PoE communication module

LAN communication module with PoE for testo 150 data loggers

Order no. 0554 9330



### WLAN communication module

WLAN communication module for testo 150 data loggers

Order no. 0554 9320 01

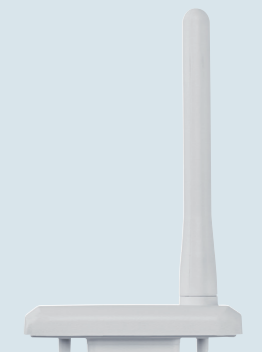


### testo UltraRange communication module

testo UltraRange communication module for testo 150 data loggers and testo UltraRange Gateway

Version	for	Order no.	Version	for	Order no.
Region Europe	Data logger	0554 9311 01	Region South Korea	Data logger	0554 9315 01
	Base and Gateway	0554 9311 02		Base and Gateway	0554 9315 02
Region Americas	Data logger	0554 9312 01	Region India	Data logger	0554 9316 01
	Base and Gateway	0554 9312 02		Base and Gateway	0554 9316 02
Region China	Data logger	0554 9313 01	Region Russia	Data logger	0554 9317 01
	Base and Gateway	0554 9313 02		Base and Gateway	0554 9317 02
Region APAC*	Data logger	0554 9314 01			
	Base and Gateway	0554 9314 02			

\*Japan, Malaysia, Singapore, Taiwan, Macau



## Compatible components

Base	Order no.
testo Saveris Base V3.0	0572 9320

Gateway	Order no.
testo UltraRange Gateway	0572 9310

Data logger	Order no.
testo 150 TUC4 data logger	0572 3320
testo 150 TC4 data logger	0572 3330
testo 150 DIN2 data logger	0572 3340
testo 150 T1 data logger	0572 3350

## Digital analog coupler and connection box for external probes for the data logger module testo 150 TUC4

testo Saveris Pharma



Integration of lots of other measurement parameters via 4 – 20 mA connection

Standardized interfaces for easy integration

Easy connection to the testo 150 TUC4 data logger via TUC (Testo Universal Connector)

In addition to temperature and humidity, other measurement parameters such as differential pressure can be integrated into the Testo environmental monitoring system. For

example, all transmitters with standardized current and voltage inputs can be integrated.

### Order data

#### Digital analog coupler for testo 150

Order no. 0572 2166



#### Connection box for external probes

For one probe Order no. 8793 0041  
For two probes Order no. 8793 0042



#### testo 150 TUC4 data logger module with 4 connections for probes with TUC

Order no. 0572 3320



**Note: For technical data on the digital analog coupler, please see page 25**





# Digital temperature and humidity probes for the testo 150 TUC4 data logger module



- High-precision digital probes for standard-compliant measurements
- Probe replacement within seconds, with no data gaps in the documentation
- Wide temperature measuring range
- Easy handling and installation
- Efficient system monitoring with digital door contacts

The digital probes make it possible to carry out high-precision measurements even in a regulated environment. It is not necessary to interrupt the measurement to calibrate the probes – they are replaced during operation. There is no need to remove the data loggers and there are no gaps in the measured values.

The digital probes can be used with the testo 150 TUC4 data logger module and benefit from the versatility of the testo Saveris 1 environmental monitoring system: Use either different communication infrastructures such as WLAN or Ethernet, or the state-of-the-art testo UltraRange radio technology for unparalleled, secure and efficient long-range communication in a proprietary network.

**!** Note: For technical data on digital temperature and humidity probes, please see page 26

## Order data

### Probe/logger matrix

Order no.	Description	testo 150 TUC4	testo 150 TC4	testo 150 DIN2
<b>Digital probes</b>				
8721 0039	High-precision digital humidity/temperature cable probe	X	-	-
0572 2162	Digital NTC stub temperature probe	X	-	-
0572 2163	Digital PT100 cable temperature probe	X	-	-
0572 2164	Digital stub humidity/temperature probe	X	-	-
0572 2165	Digital cable humidity/temperature probe	X	-	-
0572 2161	Digital door contact	X	-	-
0618 0071	Flexible digital Pt100 temperature probe	X	-	-
0618 7072	Glass-coated digital Pt100 laboratory probe	X	-	-
8791 0006	Digital alarm contact, 1.3 m	X	-	-
8791 0013	Digital alarm contact, 5 m	X	-	-

### Accessories

	Temperature range	Order no.
Extension cable 2 m	-30 to +50 °C	0449 3302
Extension cable 6 m	-30 to +50 °C	0449 3306
Extension cable 10 m	-30 to +50 °C	0449 3310

### Universal probe holder - for testo 150 data logger

Order no. 8793 0037



# Analog temperature probes for the testo 150 data logger modules



- High-precision measurement in the GxP-regulated environment
- Wide temperature measuring range
- Extensive probe portfolio – customized adaptations are also possible
- Short response time
- Different cable variants and cable lengths available

Testo's analog temperature probes cover almost every possible temperature measurement scenario in sophisticated applications.

**NTC resistance probes** are exceptionally robust and reliable. They also feature a high degree of accuracy and a wide range of applications within temperature measurement.

**Platinum resistance probes (PT100)** are used when a wider temperature range needs to be measured than can be covered by NTC resistance probes, for example.

**Thermocouples** really stand out thanks to a flexible and broad selection of suitable sensors for a wide range of applications.

# Probe/logger matrix

Type	Probes	Order no.	Probe suitable for data logger		
			testo 150 TUC4	testo 150 TC4	testo 150 DIN2
NTC	Penetration probe NTC with ribbon cable, cable length 2 m, IP 54	0572 1001	-	-	X
	External temperature probe 12 mm, plug-in, without cable	0572 2153	-	-	X
	Stub probe, IP 54	0628 7510	-	-	X
	Accurate immersion/penetration probe, cable length 6 m, IP 67	0610 1725	-	-	X
	Stationary probe with aluminium sleeve, IP 65	0628 7503	-	-	X
	Pipe wrap probe with Velcro tape for pipe diameters up to max. 75 mm	0613 4611	-	-	X
	Probe for surface measurement	0628 7516	-	-	X
	Wall surface temperature probe	0628 7507	-	-	X
	Stainless steel NTC food probe (IP65) with PU line	0613 2211	-	-	X
	Waterproof NTC immersion/penetration probe	0613 1212	-	-	X
	Accurate immersion/penetration probe, cable length 1.5 m, IP 67	0628 0006	-	-	X
	Waterproof immersion/penetration probe	0615 1212	X	-	-
	Robust air probe	0615 1712	X	-	-
	Temperature probe with Velcro	0615 4611	X	-	-
	Pt100	Penetration probe Pt100 with ribbon cable, cable length 2 m, IP54	0572 7001	-	-
Robust, waterproof Pt100 immersion/penetration probe		0609 1273	-	-	X
Robust Pt100 stainless steel food probe (IP65)		0609 2272	-	-	X
TC	Penetration probe, TC type K with ribbon cable, cable length 2 m, IP 54	0572 9001	-	X	-
	Thermocouple with TC plug, flexible, length 800 mm, fibreglass	0602 0644	-	X	-
	Thermocouple with TC plug, flexible, length 1500 mm, fibreglass	0602 0645	-	X	-
	Thermocouple with TC plug, flexible, length 1500 mm, PTFE	0602 0646	-	X	-
	Magnetic probe, adhesive force approx. 20 N, with adhesive magnets	0602 4792	-	X	-
	Magnetic probe, adhesive force approx. 10 N, with adhesive magnets	0602 4892	-	X	-
	Immersion measuring tip, flexible, for measurements in air/flue gases	0602 5693	-	X	-
	Immersion measuring tip, flexible	0602 5792	-	X	-
	Flexible, low-mass immersion measuring tip	0602 0493	-	X	-
	Pipe wrap probe for pipe diameters 5 to 65 mm	0602 4592	-	X	-
	Pipe wrap probe with Velcro strip	0628 0020	-	X	-
	Stationary probe with stainless steel sheath	0628 7533	-	X	-
	Waterproof superfast needle probe	0628 0027	-	X	-
	Frozen food probe for screw-in use without pre-drilling	0603 3292	-	X	-
	Robust food penetration probe with special handle	0603 2492	-	X	-
Waterproof standard immersion/penetration probe	0603 1293	-	X	-	

**!** Note: For technical data on analog temperature probes, please see pages 27 and 28

# Measurement data management software for the most stringent requirements



- Software including database for installation on PC or server
- Fast localization and analysis of alarms with graphic visualization
- Platform-independent data access
- Customizable alarm management and reporting
- Reduced training requirement and low error potential thanks to intuitive operability
- Alarm acknowledgement possible via mobile devices

In the testo Saveris software, all measurement data is collated, visualized and documented seamlessly.

The validatable CFR version of the software ensures strict compliance with US 21 CFR Part 11 as well as Annex 11 of the EU GMP Guideline through maximum data integrity, audit trail, user levels with different user rights and electronic signatures.

The web-based, intuitive testo Saveris 1 interface also allows alarms to be identified and acknowledged at all times and from any end device. Alarms are clearly presented in the testo Saveris 1 web interface and can no longer be overlooked. Each acknowledgement of an alarm must be completed with a personalized, digital signature as well as a mandatory comment on the event.

The REST API allows you to quickly and easily retrieve data from the monitoring system to transfer it to other systems, such as your own building or lab management system.



## testo Saveris 1 software user-friendly – fast – secure

- Easy and intuitive to use, platform-independent user interface
- Flexible user management – site management with role access and user management
- Recorded measurement data is centrally archived and securely stored by the software
- Individual and detailed alarm management with escalation levels, freely configurable alarms and alarm forwarding
- Alarm management including escalation levels
- Easy and location-independent access to measurement data and alarm acknowledgement via mobile devices
- Back-to-normal notification via email & webhook
- Individualization of the system through integration of own floor plans and logos
- Geographical hierarchical structure of a complex system of many measuring points
- Calibration management
- Reporting (report templates and individual configuration)
- Graphical and tabular display of measurement data
- Simple installation

### Additional functions of the testo Saveris 1 CFR software

- Extended flexible user management
- Audit trail and ERES (Electronic Records / Electronic Signatures) concept based on regulatory requirements according to 21CFR Part 11 and EU Annex 11 of the GMP regulations

### Additional functions of the testo Saveris 1 REST API

- Detailed information about a channel and the sensors connected to it
- Measured values for a channel in a specific, freely selectable time interval
- All alarms (active & unacknowledged) of a Base
- General instrument information such as serial number and name and ID
- Integration of third-party software to retrieve data (read only)
- Connection of building management systems to testo Saveris 1
- Integration of data from testo Saveris 1 into LIMS

## A full range of services from one supplier. Tailored support and integrated solutions.



Our specially GxP-trained service team provides customer-focused, systematic support throughout the process – from planning, documentation, system qualification and software validation to service and support. We work with you to define a customized service concept for all project phases.

We take care of your system and its maintenance, calibration and validation. We offer powerful helpdesk packages from which you can freely choose to ensure that your individual requirements are met. Whether you need basic support or more comprehensive services, we have the right solution for you. Our trained support team is on hand to help you get the most out of our products and services.

## Get started right away – with our training courses Let us show you how it's done!

Our service team also offers training courses to help you get started or migrate to the latest software version. These are modular and tailored to your individual level of expertise. You can access them digitally, experience them in the practical Testo World or on site at your premises. All training courses can be delivered in accordance with GxP, giving you complete peace of mind.

### > Basic training courses:

Basic modules for using testo Saveris 1.

### > Advanced training courses:

Modules for experienced testo Saveris users that provide in-depth insight into advanced functions.



## testo Saveris 1: The service commitment at a glance.

testo Saveris 1 supports you in four ways. The environmental monitoring system **records** and **analyzes** your critical environmental data, **alerts** you immediately if limit values are exceeded and can help you to **optimize** your processes. For this, the all-in-one solution uses three performance-related components: Hardware, software and services.



### Hardware:

#### Reliable recording of quality data.

Thanks to more than 60 years of experience in the manufacture of measuring solutions and sensors, Testo has a variety of the measuring instruments you need to monitor environmental parameters. Precise and reliable sensor technology that can be optimally integrated into your processes is our top priority.



### Software:

#### Audit-proof compliance for all relevant data.

The testo Saveris 1 software enables comprehensive analysis and evaluation of all recorded measurement parameters - with access from anywhere. Detailed logging functions and secure archiving of measurement data makes testo Saveris 1 an audit-proof central data management platform that also meets the requirements of the FDA regarding 21 CFR Part 11 and Annex 11 of the EU GMP Directive.



### Services:

#### A competent partner worldwide.

Our specially GxP-trained service team accompanies you through all process steps in a customer-oriented and systematic way – from planning, documentation, system qualification and software validation through to service and support. Together with you, we define a tailored service concept in all project phases. You can rely on us during operation, too. We take care of your system and its maintenance, calibration and validation.

## Technical data for data logger modules

	testo 150 TUC4	testo 150 TC4	testo 150 DIN2	testo 150 T1
<b>Display</b>				
Display type	Segment display			
Display functions	Display of 2 measurement channels, limit value violations, connection status, signal strength, battery status, display can be disabled			
<b>Physical specifications</b>				
Housing material	PC/PET (front) / ABS+PC+10% GF/PET (rear)			
Size (W x H x L)	69.3 x 88.0 x 29.0 mm	69.3 x 89.3 x 29.0 mm	69.3 x 87.9 x 29.0 mm	69.3 x 88.3 x 29.0 mm
Measuring range	Analog (NTC): -40 to +150 °C Digital: See probes	1. TC Type K: -200 to +1350 °C 2. TC Type J: -100 to +750 °C 3 TC Type T: -200 to +400 °C	NTC: -40 to +150 °C Pt100 (with external probe): -200 to +600 °C	-40 to +50 °C (internal probe)
Accuracy (±1 digit)	Analog (NTC): ±0.3 °C Digital: See probes	±(0.5 °C + 0.5% of measured value)	NTC: ±0.3 °C Pt100: ±0.1 °C (0 to +60 °C) ±0.2 °C (-100 to +200 °C) ±0.5 °C (other measuring ranges)	±0.4 °C
Resolution	Analog (NTC): 0.1 °C / 0.1 °F Digital: See probes	0.1 °C	NTC: 0.1 °C / 0.1 °F Pt100: 0.01 °C / 0.01 °F	0.1 °C / 0.1 °F
Weight	Approx. 255 g			
IP protection class	IP 67 & IP 65 (with mounted testo UltraRange and WLAN communication module), IP 30 (Ethernet) (in each case without probe)			
<b>Operating and storage conditions</b>				
Storage temperature	-40 to +60 °C			
Operating temperature	-40 to +50 °C			
<b>Power</b>				
Power supply	optionally via mains unit & micro USB (0572 5004)			
Battery type	4 x AA alkaline manganese batteries At temperatures below +10 °C, the use of Energizer Li batteries is recommended (0515 0572)			
Battery life	testo UltraRange: Up to 7.2 years WLAN: 3.5 years (1 h communication cycle, 15 min measurement, +25 °C, 1 digital NTC probe connected)	testo UltraRange: Up to 6.4 years WLAN: 3.3 years (1 h communication cycle, 15 min measurement, +25 °C, 1 Type K probe connected)	testo UltraRange: Up to 6.7 years WLAN: 3.7 years (1 h communication cycle, 15 min measurement, +25 °C, 1 analog NTC probe connected)	testo UltraRange: Up to 7.2 years WLAN: 3.5 years (1 h communication cycle, 15 min measurement, +25 °C)
<b>Interfaces</b>				
Connections	4x TUC micro USB TCI (testo Communication Interface)	4x thermocouple (Type K, J, T) micro USB TCI (testo Communication Interface)	2x miniDIN micro USB TCI (testo Communication Interface)	micro USB TCI (testo Communication Interface)
<b>Measurement data storage</b>				
Measuring interval	(see communication modules)			
Channels	16	4	2	1
Internal memory (per channel)	min. 16,000 readings	min. 64,000 readings	min. 128,000 readings	256,000 readings
<b>Other</b>				
Wall bracket	Included			

## Technical data for communication modules

	LAN/PoE communication module	WLAN communication module	testo UltraRange communication module
<b>Physical specifications</b>			
Housing material	Plastic		
Size (W x H x L)	67.8 x 29.5 x 28.9 mm	67.8 x 12.2 x 28.9 mm	67.8 x 112.8 x 28.9 mm
Weight	Approx. 45 g	Approx. 17 g	Approx. 30 g
IP protection class (when connected to a testo 150 data logger module)	IP 30	IP 67	IP 67
<b>Operating and storage conditions</b>			
Storage temperature	-40 to +60 °C		
Operating temperature	+5 to +50 °C	-35 to +50 °C	-40 to +50 °C
<b>Power</b>			
Power supply	via PoE (Class 0)	via TCI	via TCI
<b>Interfaces</b>			
Connections	LAN (transmission rate: 10/100 Mbit)	TCI	TCI
Connectible loggers	testo 150 TUC4, testo 150 TC4, testo 150 DIN2, testo 150 T1		
<b>Measurement data storage</b>			
Communication rate (Testo recommendation, adjustable if required)	3 min.	15 min.	15 min.
<b>Other</b>			
Radio frequency	-	2.4 GHz	868 MHz (region Europe) 868 MHz (China) 920 MHz (region APAC*) 915 MHz (region Americas) 922 MHz (South Korea) 865 MHz (India) 868 MHz (Russia)
Transmission range		20 m inside buildings	100 m inside buildings (depending on spatial conditions) 17 km with no obstructions

\*Japan, Malaysia, Singapore, Taiwan, Macau

## Technical data for Base station and Gateway

	Base station testo Saveris Base V3.0	testo UltraRange Gateway
<b>Physical specifications</b>		
Housing material	ABS/PC plastic	
Dimensions (L x W x H)	193 x 112 x 46 mm	
Weight	Approx. 370 g	Approx. 314 g
IP protection class	IP20	
<b>Operating and storage conditions</b>		
Storage temperature	-20 to +60 °C	-20 to +80 °C
Operating temperature	+5 to +35 °C	0 to +50 °C
<b>Power</b>		
Power supply	PoE class 0; optionally via mains unit & micro USB cable (order no. 0572 5004)	
Rechargeable battery type	Li-Ion rechargeable battery, 3.7 V / 2.6 Ah, Order no. 0515 0107 (for data backup and emergency alarm in the event of power failure)	-
<b>Interfaces</b>		
Connections	2x USB LAN/PoE: Transfer rate 10/100 Mbit PoE class 0 micro USB alarm relay connection	1x USB LAN/PoE: Transfer rate 10/100 Mbit PoE class 0 micro USB
Channels per Base	3,000	-
Loggers per Gateway	-	40
<b>Measurement data storage</b>		
Memory	Circular buffer memory	-
Max. number of measurement values	120,000,000	-
Internal memory (per channel)	40,000	-
<b>Other</b>		
Alarm relay	Connection for external alarm relay available	-
GSM module	via LTE stick	-

## Technical data digital analog coupler and connection box

	digital analog coupler	connection box
<b>Physical specifications</b>		
Housing material	Plastic	
Size (W x H x L)	85 x 100 x 38 mm	125 x 200 x 45 mm
Weight	240 g	8793 0041: 240 g 8793 0042: 454 g
IP protection class	IP54	IP20
<b>Operating and storage conditions</b>		
Storage temperature	-25 to +60 °C	
Operating temperature	+5 to +45 °C	
<b>Power</b>		
Power supply	Power supply via testo 150 TUC4 logger	Input: 24 V DC Output: 5 VDC (for power supply of the connected data logger)
<b>Interfaces</b>		
Connections	2- or 4-wire current/voltage input	
Connectible loggers	testo 150 TUC4	
<b>Measurement data storage</b>		
Measuring range	4 to 20 mA; 0 to 10 V	
Measuring interval / communication rate	Dependent on data logger testo 150 TUC4	
Accuracy	Power Maximum error: ±0.03 mA Resolution (min. error): 0.75 µA (16 bit) typical error: 5 µA  Voltage 0 to 1 V maximum error: ±1.5 mV resolution (min. error): 39 µV (16 bit) Typical error: 250 µV 0 to 5 V maximum error: ±7.5 mV resolution (min. error): 0.17 mV typical error: 1.25 mV 0 to 10 V maximum error: ±15 mV Resolution (min. error): 0.34 mV Typical error: 2.50 mV	
Cable length	max. 3 m	

## Technical data for digital temperature and humidity probes



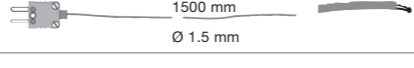
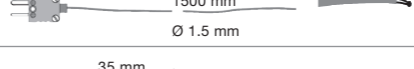
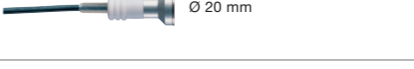

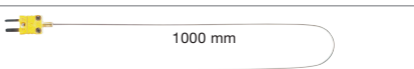

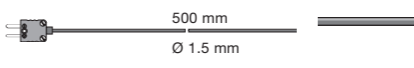
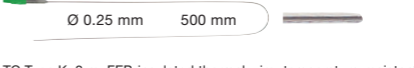


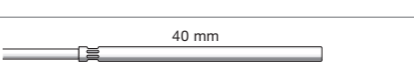
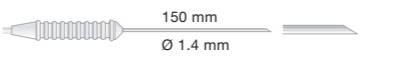
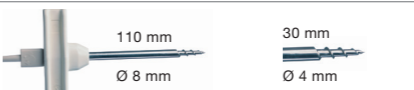


Probes	Digital NTC stub temperature probe 0572 2162	Digital stub humidity/temperature probe 0572 2164**	Digital cable humidity/temperature probe 0572 2165** 8721 0039**	Digital door contact 0572 2161
Measurement parameters	°C/°F	°C/°F, %RH (+ °C <sub>td</sub> , g/m <sup>3</sup> )	°C/°F, %RH (+ °C <sub>td</sub> , g/m <sup>3</sup> )	-
Probe type	NTC	NTC	NTC	-
Operating temperature	-30 to +50 °C			
Storage temperature	-30 to +60 °C			
Measuring range	-30 to +50 °C	-30 to +50 °C / 0 to 100 %RH (non-condensing)		I/O
System accuracy	±0.4 °C	±0.4 °C at +25 °C ±2.0 %RH at 0 to 90 %RH at +25 °C ±1.0 %RH at 0 ... 90 %RH at +25 °C (order no. 8721 0039) ±0.03 %RH/K (k=1) ±1.0 %RH hysteresis ±1.0 %RH/year drift		-
Resolution	0.1 °C	0.1 °C / 0.1 %RH		-
Dimensions	Length 140 mm Ø 15 mm	Length 140 mm Ø 15 mm		Length 30 mm / width 40 mm / height 7 mm
Cable diameter	-	-	5 mm	2 mm
Cable length	-	-	1.3 m	1.3 m
Protection class	IP54 in the data logger/probe system			
Weight	17.2 g	17.4 g	40.8 g	22.8 g
t <sub>90</sub>	°C 240 s	°C 240 s / %RH 20 s	°C 240 s / %RH 20 s	-
Connection	TUC			

\*\*Please do not use the probe head in condensing atmospheres. For continuous application in high-humidity ranges: > 80 %RH at ≤ 30 °C for > 12 h and > 60 %RH at > 30 °C for > 12 h, please contact Testo Service or contact us via the Testo website.

Probes	Digital Pt100 cable temperature probe 0572 2163*	Flexible digital Pt100 temperature probe 0618 0071	Glass-coated digital Pt100 laboratory probe 0618 7072	Alarm contact: 2x ferrules, white 8791 0013
Measurement parameters	°C/°F	°C/°F	°C/°F	°C/°F
Probe type	Pt100	Pt100	Pt100	Pt100
Operating temperature	-30 ... +50 °C			
Storage temperature	-30 ... +60 °C			
Measuring range	-85 to +150 °C (only probes and cable)	-100 to +260 °C	°C/°F	
System accuracy	±(0.25 °C + 0.3% of reading) at -49.9 to +99.9 °C ±0.55 °C remaining measuring range	±(0.3 °C + 0.3% of measured value)	Pt100	
Resolution	0.01 °C	0.01 °C	0.01 °C	
Dimensions	Longueur 90 mm, Ø 5mm, rétréci à 3,6 mm, pointu au centre	Length 1000 mm Ø 4 mm	Länge 200 mm Ø 6 mm	Length 200 mm Ø 6 mm
Cable diameter	1.2 x 3.8 mm	4 mm	3 mm	2.0 x 4.0 mm
Cable length	1.3 m	1 m	1,6 m	5 m 1,3 m Order no. 8791 0006)
Protection class	IP42 in the data logger/probe system			
Weight	23.8 g	29 g	39 g	27 g
t <sub>90</sub>	°C 20 s	°C 45 s	°C 45 s	
Connection	TUC			

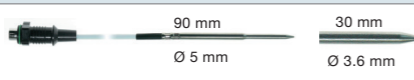




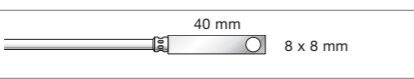

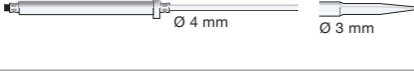
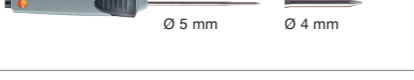
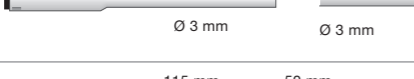
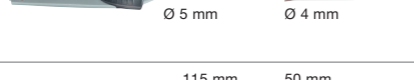
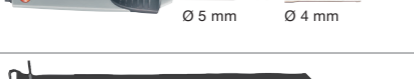
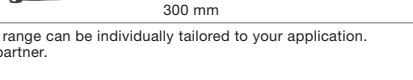
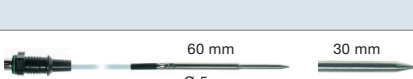
\*Pt100 accuracy Class A

## Technical data for TC probes

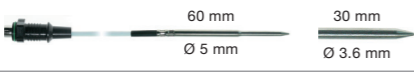

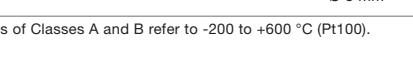
	Dimensions Probe shaft/probe shaft tip	Measuring range	Accuracy	t <sub>90</sub>	Order no.
<b>TC probes</b>					
Penetration probe, TC type K with ribbon cable, cable length 2 m, IP 54		-40 to +220 °C	Class 1*	7 sec	0572 9001
Thermocouple with TC plug, flexible, length 800 mm, fibreglass, TC Type K		-50 to +400 °C	Class 2*	5 sec	0602 0644
Thermocouple with TC plug, flexible, length 1500 mm, fibreglass, TC Type K		-50 to +400 °C	Class 2*	5 sec	0602 0645
Thermocouple with TC plug, flexible, length 1500 mm, PTFE, TC Type K		-50 to +250 °C	Class 2*	5 sec	0602 0646
Magnetic probe, adhesive power approx. 20 N, with adhesive magnets, for measurements on metal surfaces, TC Type K, connection: fixed cable		-50 to +170 °C	Class 2*	150 sec	0602 4792
Magnetic probe, adhesive power approx. 10 N, with adhesive magnets, for higher temperatures, for measurements on metal surfaces, TC type K, connection: fixed cable 1.6 m		-50 to +400 °C	Class 2*	60 sec	0602 4892
Immersion measuring tip, flexible, for measurements in air/flue gases (not suitable for measurements in smelters), TC Type K		-40 to +1000 °C	Class 1*	4 sec	0602 5693
Immersion measuring tip, flexible, TC Type K		-40 to +1000 °C	Class 1*	5 sec	0602 5792
Immersion measuring tip, flexible, TC Type K		-200 to +40 °C	Class 3*	5 sec	0602 5793
Flexible, low-mass immersion measuring tip, ideal for measurements in small volumes, such as Petri dishes, or for surface measurements (e.g. fixed with adhesive tape)	 TC Type K, 2 m, FEP-insulated thermal wire, temperature-resistant up to 200 °C, oval cable with dimensions: 2.2 mm x 1.4 mm	-200 to +1000 °C	Class 1*	1 sec	0602 0493
Pipe wrap probe for pipe diameters 5 to 65 mm, with replaceable measuring head, short-term measuring range up to +280 °C, TC type K, connection: fixed cable 1.2 m		-60 to +130 °C	Class 2*	5 sec	0602 4592
Pipe wrap probe with Velcro tape, for measuring temperatures on pipes with diameters up to max. 120 mm, Tmax +120 °C, TC type K, connection: fixed cable 1.5 m		-50 to +120 °C	Class 1*	90 sec	0628 0020
Stationary probe with stainless steel sheath, TC type K, connection: fixed cable 1.9 m		-50 to +205 °C	Class 2*	20 sec	0628 7533
Waterproof superfast needle probe for measurements with no visible penetration hole, TC type T, fixed cable		-50 to +250 °C	±0.2 °C (-20 to +70 °C) Class 1* (remaining meas. range)	2 sec	0628 0027
Frozen food probe for screw-in use without pre-drilling; TC type T, plug-in cable		-50 to +350 °C	±0.2 °C (-20 to +70 °C) Class 1* (remaining meas. range)	8 sec	0603 3292
Robust food penetration probe with special handle, reinforced cable (PVC), TC type T, fixed cable		-50 to +350 °C	±0.2 °C (-20 to +70 °C) Class 1* (remaining meas. range)	6 sec	0603 2492
Waterproof standard immersion/penetration probe, TC Type T, fixed cable		-50 to +350 °C	±0.2 °C (-20 to +70 °C) Class 1* (remaining meas. range)	7 sec	0603 1293

\*According to standard EN 60584-2, the accuracy of Class 1 refers to -40 to +1000 °C (type K), Class 2 refers to -40 to +1200 °C (type K), Class 3 refers to -200 to +40 °C (type K).

## Technical data for NTC probes / Pt100 probes

	Dimensions Probe shaft/probe shaft tip	Measuring range	Accuracy	t <sub>90</sub>	Order no.
<b>NTC probes</b>					
Penetration probe NTC with ribbon cable, cable length 2 m, IP 54		-40 to +125 °C	±0.5% of measured value (+100 to +125 °C) ±0.2 °C (-25 to +80 °C) ±0.4 °C (remaining meas. range)	8 sec	0572 1001
External temperature probe 12 mm, plug-in, without cable		-30 to +50 °C	±0.2 °C (-30 to +50 °C)	240 sec	0572 2153
Stub probe, IP 54		-20 to +70 °C	±0.2 °C (-20 to +40 °C) ±0.4 °C (+40.1 to +70 °C)	15 sec	0628 7510
Accurate immersion/penetration probe, cable length 6 m, IP 67, connection: fixed cable; Cable length: 6 m		-35 to +80 °C	±0.2 °C (-25 to +74.9 °C) ±0.4 °C (remaining meas. range)	5 sec	0610 1725
Stationary probe with aluminium sleeve, IP 65, connection: fixed cable; cable length: 2.4 m		-30 to +90 °C	±0.2 °C (0 to +70 °C) ±0.5 °C (remaining meas. range)	190 sec	0628 7503
Pipe wrap probe with Velcro tape for pipe diameters up to max. 75 mm, Tmax +75 °C, NTC, connection: fixed cable; cable length: 1.5 m		-50 to +70 °C	±0.2 °C (-25 to +70 °C) ±0.4 °C (-50 to -25.1 °C)	60 sec	0613 4611
Probe for surface measurement, fixed cable, 2 m		-50 to +80 °C	±0.2 °C (0 to +70 °C)	150 sec	0628 7516
Wall surface temperature probe, e.g. for proof of structural damage in buildings, connection: fixed cable; Cable length: 3 m		-50 to +80 °C	±0.2 °C (-25 to +80 °C) ±0.5 °C (-40 to -25.1 °C)	20 sec	0628 7507
Stainless steel NTC food probe (IP65) with PUR cable, connection: fixed cable; Cable length: 1.6 m		-50 to +150 °C	±0.5% of measured value (+100 to +150 °C) ±0.2 °C (-25 to +74.9 °C) ±0.4 °C (remaining meas. range)	8 sec	0613 2211
Waterproof NTC immersion/penetration probe, fixed cable 1.2 m		-50 to +150 °C	±0.5% of measured value (+100 to +150 °C) ±0.2 °C (-25 to +74.9 °C) ±0.4 °C (remaining meas. range)	10 sec	0613 1212
Accurate immersion/penetration probe, cable length 1.5 m, IP 67, connection: fixed cable; Cable length: 1.5 m		-35 to +80 °C	±0.2 °C (-25 to +74.9 °C) ±0.4 °C (remaining meas. range)	5 sec	0628 0006
Waterproof NTC immersion/penetration probe, fixed cable 1.2 m		-50 to +150 °C	±0.5% of measured value (+100 to +150 °C) ±0.2 °C (-25 to +74.9 °C) ±0.4 °C (remaining meas. range)	10 sec	0615 1212
Robust NTC air probe, fixed cable 1.2 m		-50 to +125 °C	±0.2 °C (-25 to +80 °C) ±0.4 °C (remaining meas. range)	60 sec	0615 1712
Temperature probe with Velcro (NTC), fixed cable 1.4 m		-50 to +70 °C	±0.2 °C (-25 to +70 °C) ±0.4 °C (-50 to -25.1 °C)	60 sec	0615 4611

The standard temperature probes from the Testo range can be individually tailored to your application. For more information please contact your Testo partner.

<b>Pt100 probes</b>					
Penetration probe Pt100 with ribbon cable, cable length 2 m, IP54		-85 to +150 °C	Class A*	35 sec	0572 7001
Robust, waterproof Pt100 immersion/penetration probe, fixed cable		-50 to +400 °C	Class A* (-50 to +300 °C) Class B* (remaining meas. range)	12 sec	0609 1273
Robust Pt100 stainless steel food probe (IP65), connection: fixed cable		-50 to +400 °C	Class A* (-50 to +300 °C) Class B* (remaining meas. range)	10 sec	0609 2272

\* According to standard EN 60751, the accuracies of Classes A and B refer to -200 to +600 °C (Pt100).

## testo Saveris 1: What our customers say.



A high level of commitment to the project on the part of everyone involved, as well as a broad range of specialist expertise, flexibility, speed and a trust-based working relationship on an equal footing were the basis for the very successful project implementation and the achievement of the objectives. We are therefore happy to continue this collaboration.



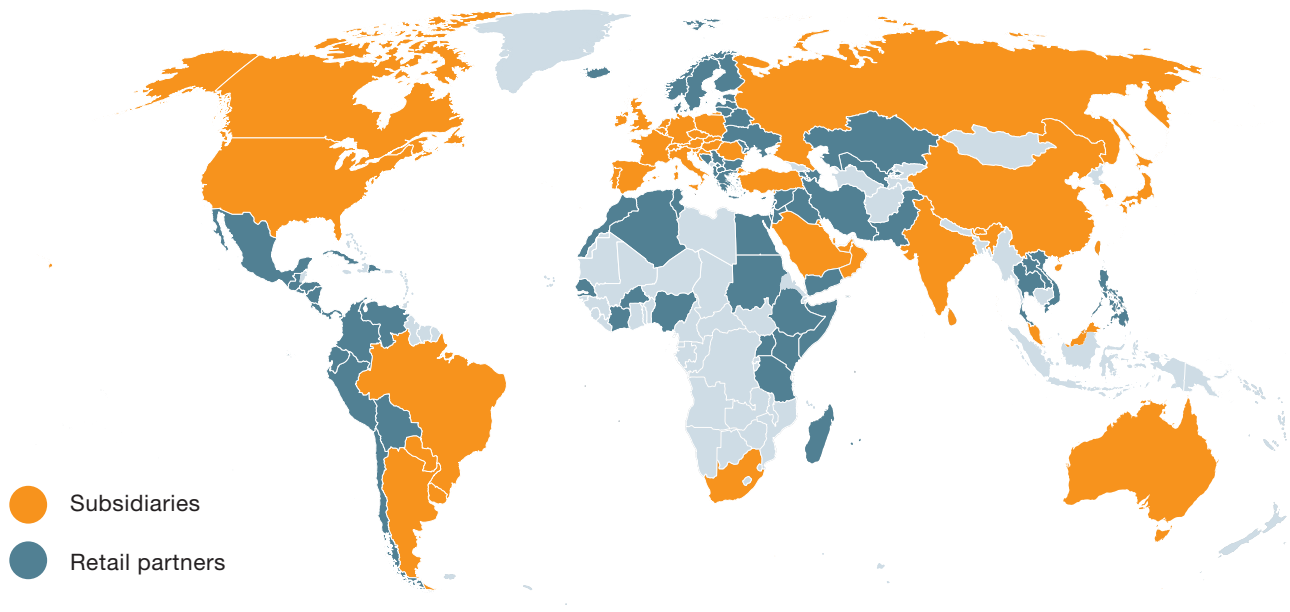
The excellent, long-standing cooperation between Pharma Stulln, Testo Solutions GmbH and Testo Industrial Services GmbH deserves special mention. The latter is responsible for recalibrating and validating the testo Saveris 1 components and enables the user to receive the hardware, software and service activities as an all-in-one package.



In the automated small parts warehouse, the sensors are installed so high up that it would be impractical to have to use a ladder to change the batteries. If a customer requires an audit, we can show the temperature changes and generate reports at the touch of a button – GMP-compliant if required. This is because the system records exactly who has changed what, when and why. In concrete terms, this means: We always have the data we need to satisfy our customers.



## High-tech from southern Germany.



For over 60 years, Testo has been known for creating innovative measuring solutions made in Germany. As a world market leader in portable and stationary measuring technology, we support our customers in saving time and resources, in protecting the environment and human health and in increasing the quality of goods and services. More than 3900 employees work in research, development, production and marketing for the high-tech company in 37 subsidiaries all over the world. Testo impresses more than 1 million customers all over the world with

high-precision measuring instruments and innovative solutions for the measurement data management of tomorrow. An average annual growth rate of roughly 10 % since the company's foundation in 1957 and a current turnover of just about 466,5 million Euros impressively demonstrate that southern Germany and high-tech systems go hand in hand. The above-average investments in the future of the company are also a part of Testo's recipe for success. Testo invests about a tenth of annual turnover in research and development.