

Be sure. **testo**

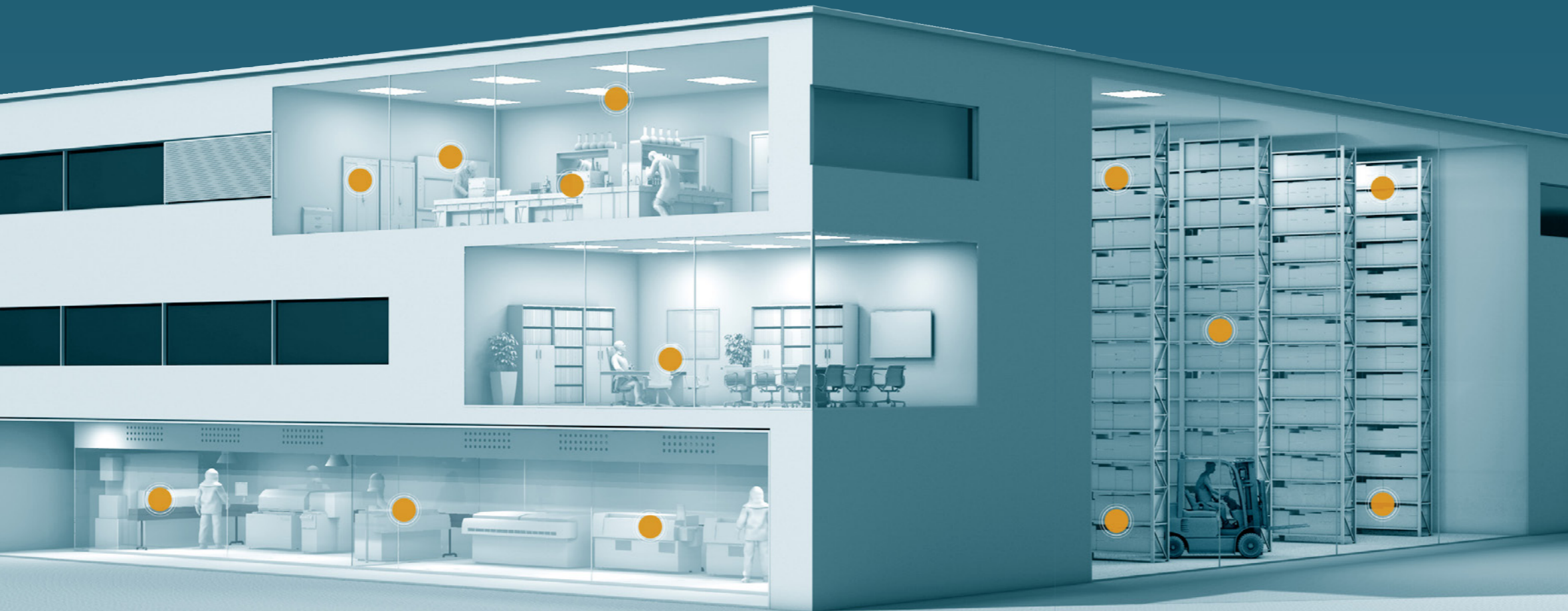


Environmental monitoring system **testo Saveris Pharma.**

Automated and uninterrupted measurement data recording with
comprehensive alarm management.

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

The all-in-one solution testo Saveris Pharma was developed in conjunction with industry experts, utilizing our more than 10 years of experience in pharmaceuticals. High-precision measurement technology, intuitive software and comprehensive services will help you work with speed and efficiency, and in compliance with GxP 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 the intelligent alarm functions for fast action according to your CAPA system.
- ✔ 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 Pharma: Areas of application for the Solution

Environmental monitoring along the entire supply chain

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

Manufacturing

If pharmaceutical products such as drugs, medicines, APIs (Active Pharmaceutical Ingredients), biopharmaceuticals, tissue samples or medical devices are not produced and stored in the right climatic conditions, the stability and efficacy of the products can suffer. The internationally applicable minimum standards stipulate that the relevant areas must be qualified, and the environmental conditions must be monitored and documented in such a way that they cannot be tampered with, and the monitoring devices must be calibrated to comply with the guidelines. testo Saveris Pharma automates the centralized and complete documentation of measurement data and enables a rapid response capability in the event of limit value violations or other system-critical deviations via a comprehensive alarm management system.

testo Saveris Pharma offers an all-in-one solution consisting of sensor technology, 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 complies with the ERES (Electronic Records, Electronic Signatures) concept and is therefore compliant with the 21 CFR Part 11 requirement for automated systems.

Logistics

Internationally applicable minimum standards also require continuous temperature monitoring and documentation for the storage of pharmaceutical goods, as well as calibration of the measuring instruments used at a predefined interval. This ensures that the quality and safety of the products is not compromised. Before installing an environmental monitoring system, a reliable temperature distribution study (temperature mapping study) must be carried out so that the system is set up in accordance with the study results.

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

Healthcare

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 this is needed in operating theatres and treatment rooms of a hospital to monitor medicines, in a blood and tissue bank to protect samples, or in an in-house pharmacy where sensitive medicines are manufactured and stored – as a centralized environmental monitoring system, testo Saveris Pharma brings lots of different rooms and facilities together across multiple locations to ensure compliant documentation. Our solution is used in the following areas of healthcare to protect patients and sensitive samples:

Monitoring of environmental conditions in indoor areas:

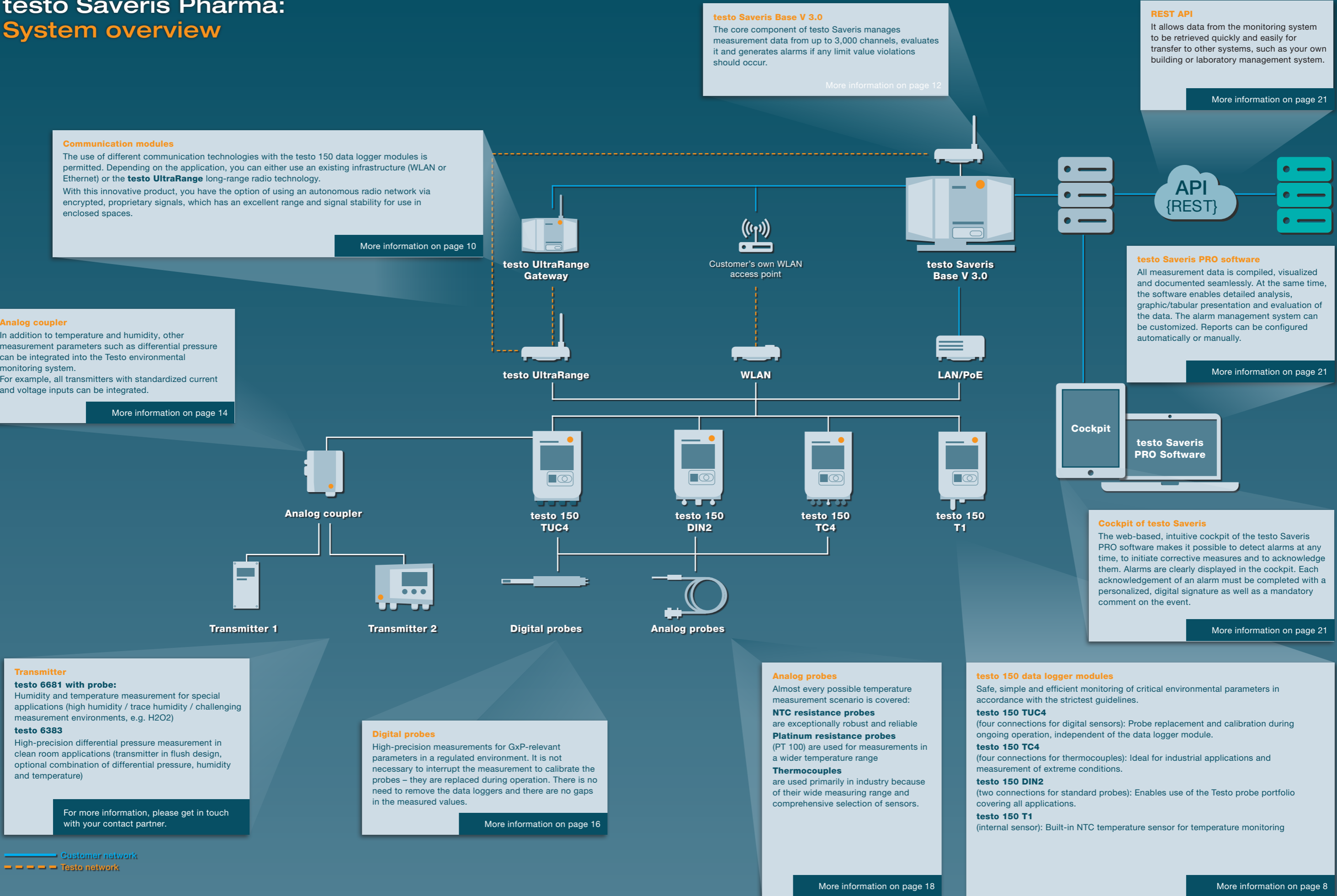
- Hospitals
 - Laboratories
 - Operating theatres
 - Treatment rooms and patient wards
 - Pharmacy
 - (Cold) storage
 - Cleanrooms
- Blood and tissue banks

Monitoring the temperature and humidity of equipment:

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



testo Saveris Pharma: System overview



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

The testo Saveris Base V3.0 is the core component of the testo Saveris Pharma 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. Various alarm transmitters can be connected via an alarm relay – so you can have alerts via SMS as well as optical or acoustic signals.

In addition to Ethernet and WLAN, the testo Saveris Pharma 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	

Data logger modules for monitoring environmental parameters

testo 150



- Automated, uninterrupted, no-loss recording of measurement data in a regulated GxP environment
- Can be combined with Testo communication modules for measurement data transmission via WLAN, Ethernet or testo UltraRange technology
- GxP-compliant alarm system and documentation
- Efficient monitoring by connecting up to four sensors
- Certified according to DIN EN 12830:2018
- In the event of any limit value violations, dual 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 PRO 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.

Optional magnetic attachment for the testo 150 wall bracket.

For quick, effortless and secure attachment to the corresponding surfaces.

Note: Technical data can be found on page 22

Order data

testo 150 TUC4

Data logger module with display and 4 connections for all Testo sensors with TUC (Testo Universal Connector). Incl. wall bracket, batteries and calibration protocol.

Order no. 0572 3320

EN 12830:2018

testo 150 DIN2

Data logger module with display and 2 connections for temperature sensors with miniDIN connector. Incl. wall bracket, batteries and calibration protocol.

Order no. 0572 3340

EN 12830:2018

testo 150 TC4

Data logger module with display and 4 connections for thermocouples. Incl. wall bracket, batteries and calibration protocol.

Order no. 0572 3330

EN 12830:2018

testo 150 T1

Data logger module with display and 1 internal NTC temperature sensor. Incl. wall bracket, batteries and calibration protocol.

Order no. 0572 3350

EN 12830:2018

Accessories

Accessories	Order no.
L91 Energizer batteries	0515 0572
Mains unit & USB cable for testo 150	0572 5004
4 x AlMn battery LR 6 (alkaline manganese AA batteries)	0515 0414
Magnetic attachment for testo 150 wall bracket	0554 2001

Communication modules	Order no.
LAN / PoE communication module	0554 9330
WLAN communication module	0554 9320 01
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

Accessories

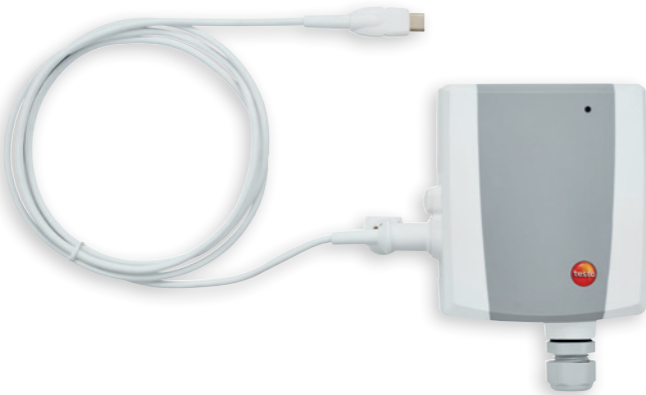
Base	Order no.
testo Saveris Base V3.0	0572 9320

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 with current/voltage input 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.

The digital analog coupler is easily integrated into the Saveris system via Ethernet, WLAN or testo UltraRange radio technology using the testo 150 TUC4 data logger.

Order data

Digital analog coupler
for testo 150



Order no. 0572 2166



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 the GxP-regulated environment
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 for GxP-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.

The digital probes can be used with the testo 150 TUC4 data logger module, and they can benefit from the versatility of the testo Saveris Pharma 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
Digital probes				
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	–	–

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

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 the pharmaceutical sector.


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	–	–	X
	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

testo Saveris PRO
testo Saveris CFR
testo Saveris Cockpit
testo Saveris REST API



Client and viewer 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
Possibility of alarm acknowledgement via smart device

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 Cockpit also allows alarms to be identified and acknowledged at all times and from any terminal device. Alarms are clearly presented in the testo Saveris Cockpit 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.

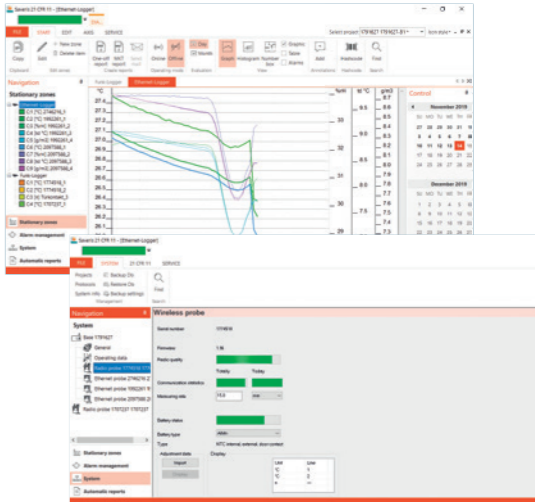
The REST API allows you to quickly and easily retrieve data from the monitoring system to transfer it to other systems, such as your own building or lab management system.

testo Saveris PRO	
testo Saveris PRO software (1-10 users) + Cockpit	Order no. 0572 0181
testo Saveris PRO license (+1 user)	Order no. 0572 0190
testo Saveris CFR	
testo Saveris CFR software license (1-10 users) + Cockpit	Order no. 0572 0182
testo Saveris CFR software license (+1 user)	Order no. 0572 0193
testo Saveris CFR Software license (unlimited)	Order no. 0572 0195
testo Saveris REST API	
Access Code REST API	Order no. 0572 1861



testo Saveris PRO Software

- Alarm management incl. escalation management
- Calibration management
- Extended analysis functions without data export as a CSV file (however optionally also possible)
- Individual reporting based on the rules and wishes of the user
- Analysis and graphical/tabular display of measurement data
- Client-server concept: the measurement data can be monitored by different PCs connected to the network
- All recorded measurement data from humidity and temperature monitoring is centrally archived and stored tamper-proof by the testo Saveris software.



The testo Saveris CFR software also includes

- Powerful user management based on different Windows user groups and the respective valid Windows Active Directory entries
- Audit trail and aERES (Electronic Records / Electronic Signatures) concept based on regulatory requirements according to 21CFR part 11 and EU Annex 11 of the GMP regulations

testo Saveris Cockpit

- Easy and location-independent access to measurement data as well as alarm acknowledgement via your smart device
- Easy and intuitively operated, platform-independent user interface
- Significantly reduced requirement for training and the creation of training courses and SOPs
- Geographically hierarchical structure allows zooming into complex systems with a large number of measurement locations
- Powerful user management, based on the customer's Windows Active Directory content
- Control of access and alarm acknowledgement rights
- Individualization of the system by upload of own floor plans and logos



testo Saveris 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
- Connecting third-party software to the cockpit to retrieve data (read only)
- Integration of data into existing (LIMS) laboratory information and management systems and connection to building management systems

Technical data for data logger modules

	testo 150 TUC4	testo 150 TC4	testo 150 DIN2	testo 150 T1
Display				
Display type	Segment display			
Display functions	Display of 2 measurement channels, limit value violations, connection status, signal strength, battery status, display can be disabled			
Physical specifications				
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)			
Operating and storage conditions				
Storage temperature	-40 to +60 °C			
Operating temperature	-40 to +50 °C			
Power				
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)
Interfaces				
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)
Measurement data storage				
Measuring interval	5 seconds to 24 hours (Ethernet communication) / 1 minute to 24 hours (testo UltraRange radio or WLAN)			
Channels	16	4	2	1
Internal memory (per channel)	min. 16,000 readings	min. 64,000 readings	min. 128,000 readings	256,000 readings
Communication cycle	1 minute to 24 hours			
Other				
Wall bracket	Included			

Technical data for communication modules

	LAN/PoE communication module	WLAN communication module	testo UltraRange communication module
Physical specifications			
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
Operating and storage conditions			
Storage temperature	-40 to +60 °C		
Operating temperature	-35 to +50 °C	-35 to +50 °C	-40 to +50 °C
Power			
Power supply	via PoE (Class 0)	via TCI	via TCI
Interfaces			
Connections	LAN (transmission rate: 10/100 Mbit)	TCI	TCI
Connectible loggers	testo 150 TUC4, testo 150 TC4, testo 150 DIN2, testo 150 T1		
Measurement data storage			
Communication cycle	1 min to 24 h		
Other			
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
Physical specifications		
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	
Operating and storage conditions		
Storage temperature	-20 to +60 °C	-20 to +80 °C
Operating temperature	+5 to +35 °C	0 to +50 °C
Power		
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)	-
Interfaces		
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
Measurement data storage		
Memory	Circular buffer memory	-
Max. number of measurement values	120,000,000	-
Internal memory (per channel)	40,000	-
Other		
Alarm relay	Connection for external alarm relay available	-
GSM module	via LTE stick	-

Technical data for digital analog coupler


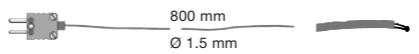


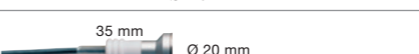




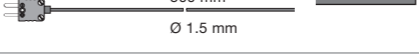
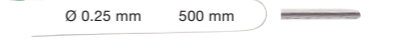
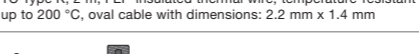



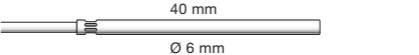
Physical specifications	
Housing material	Plastic
Size (W x H x L)	85 x 100 x 38 mm
Weight	240 g
IP protection class	IP54
Operating and storage conditions	
Storage temperature	-25 to +60 °C
Operating temperature	+5 to +45 °C
Power	
Power supply	Power supply via testo 150 TUC4 logger
Interfaces	
Connections	2- or 4-wire current/voltage input
Connectible loggers	testo 150 TUC4
Measurement data storage	
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

Technical data for digital temperature and humidity probes

				
Probes	Digital NTC stub temperature probe	Digital stub humidity/temperature probe	Digital cable humidity/temperature probe	Digital door contact
Order no.	0572 2162	0572 2164**	0572 2165**	0572 2161
Measurement parameters	°C/°F	°C/°F, %RH (+ °C _{td} , g/m ³)	°C/°F, %RH (+ °C _{td} , g/m ³)	–
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 ± 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	IP42 in the data logger/probe system			
Weight	17.2 g	17.4 g	40.8 g	22.8 g
t ₉₀	°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.				




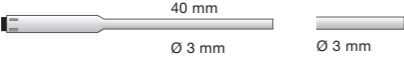
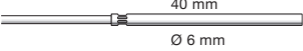



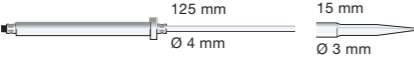
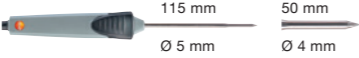
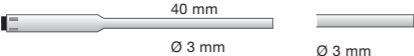
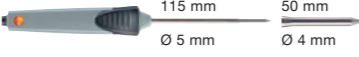
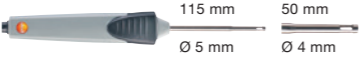

			
Probes	Digital Pt100 cable temperature probe	Flexible digital Pt100 temperature probe	Glass-coated digital Pt100 laboratory probe
Order no.	0572 2163*	0618 0071	0618 7072
Measurement parameters	°C/°F	°C/°F	°C/°F
Probe type	Pt100	Pt100	Pt100
Operating temperature	-30 to +50 °C		
Storage temperature	-30 to +60 °C		
Measuring range	-85 to +150 °C (only probes and cable)	-100 to +260 °C	-50 to +400 °C
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)	±(0.3 °C + 0.3% of measured value) (-50 to +300 °C) ±(0.4 °C + 0.6% of measured value) (+300.01 to +400 °C)
Resolution	0.01 °C	0.01 °C	0.01 °C
Dimensions	Length 90 mm Ø 3 mm	Length 1000 mm Ø 4 mm	Length 200 mm Ø 6 mm
Cable diameter	1.2 x 3.8 mm	4 mm	3 mm
Cable length	1.3 m	1 m	1.6 m
Protection class	IP42 in the data logger/probe system		
Weight	23.8 g	29 g	39 g
t ₉₀	°C 20 s	°C 45 s	°C 45 s
Connection	TUC		
*Pt100 accuracy Class A			

Technical data for TC probes

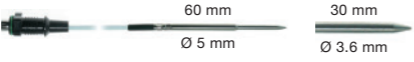

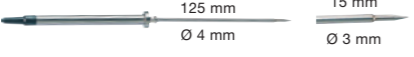
	Dimensions Probe shaft/probe shaft tip	Measuring range	Accuracy	t ₉₀	Order no.
TC probes					
Penetration probe, TC type K with ribbon cable, cable length 2 m, IP 54	 60 mm Ø 5 mm30 mm Ø 3.6 mm	-40 to +220 °C	Class 1*	7 sec	0572 9001
Thermocouple with TC plug, flexible, length 800 mm, fibreglass, TC Type K	 800 mm Ø 1.5 mm	-50 to +400 °C	Class 2*	5 sec	0602 0644
Thermocouple with TC plug, flexible, length 1500 mm, fibreglass, TC Type K	 1500 mm Ø 1.5 mm	-50 to +400 °C	Class 2*	5 sec	0602 0645
Thermocouple with TC plug, flexible, length 1500 mm, PTFE, TC Type K	 1500 mm Ø 1.5 mm	-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	 35 mmØ 20 mm	-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	 75 mmØ 21 mm	-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	 1000 mm Ø 3 mm	-200 to +1300 °C	Class 1*	4 sec	0602 5693
Immersion measuring tip, flexible, TC Type K	 500 mm Ø 1.5 mm	-200 to +1000 °C	Class 1*	5 sec	0602 5792
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)	 Ø 0.25 mm500 mm	-200 to +1000 °C	Class 1*	1 sec	0602 0493
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					
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	 395 mm20 mm	-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	 40 mm Ø 6 mm	-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	 150 mm Ø 1.4 mm	-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	 110 mm Ø 8 mm30 mm Ø 4 mm	-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	 115 mm Ø 5 mm30 mm Ø 3.5 mm	-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	 112 mm Ø 5 mm50 mm Ø 4 mm	-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 ₉₀	Order no.
NTC probes					
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.

Pt100 probes					
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).



The testo Saveris Pharma performance promise.

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



Sensors: Reliable recording of quality data.

Thanks to more than 60 years of experience in the manufacture of measuring solutions and sensors, Testo has all the measuring instruments you need to monitor environmental parameters. These include data loggers for automatic recording of readings and alerts.



Software: Audit-proof compliance for all GxP-relevant data.

The testo Saveris CFR software fulfils FDA requirements with regard to 21 CFR Part 11 as well as Annex 11 of the EU GMP guidelines, with an audit-proof central data management platform that is accessible worldwide. The platform enables comprehensive analysis and evaluation of all recorded measurement parameters – with the aid of flexible alarm systems, various logging functions and a wide variety of database-hosting options.

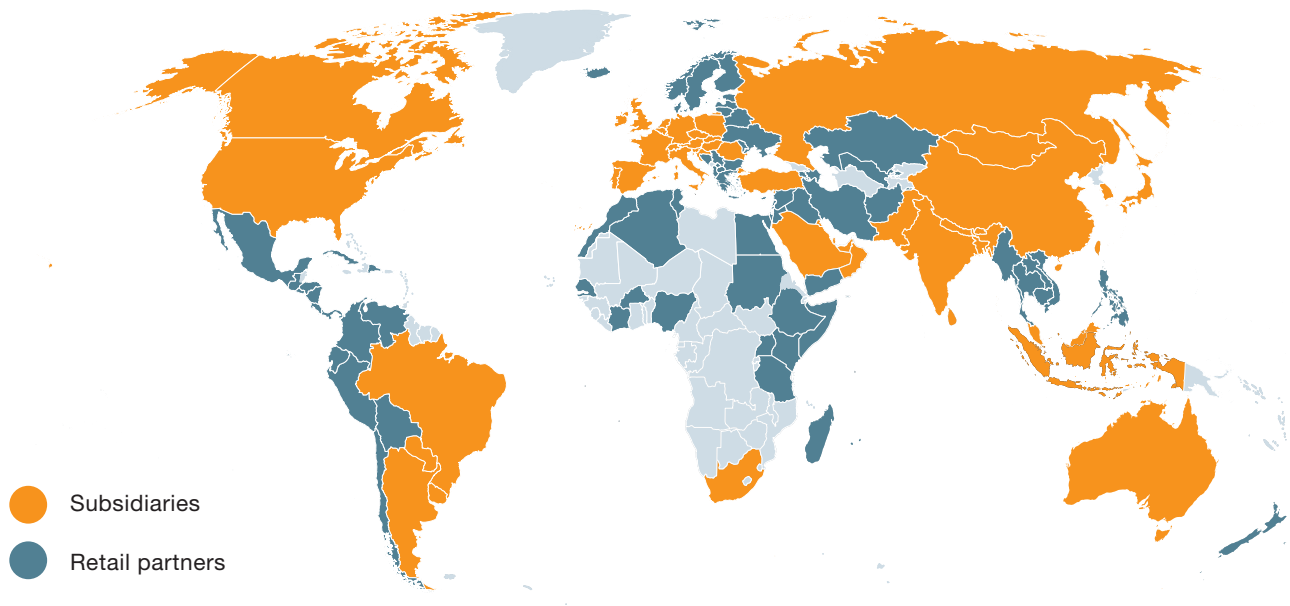


Services: A competent partner worldwide.

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.



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 3000 employees work in research, development, production and marketing for the high-tech company in 35 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 of over 10% since the company's foundation in 1957 and a current turnover of just short of 300 million Euros impressively demonstrate that southern Germany and high-tech systems go perfectly together. 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.