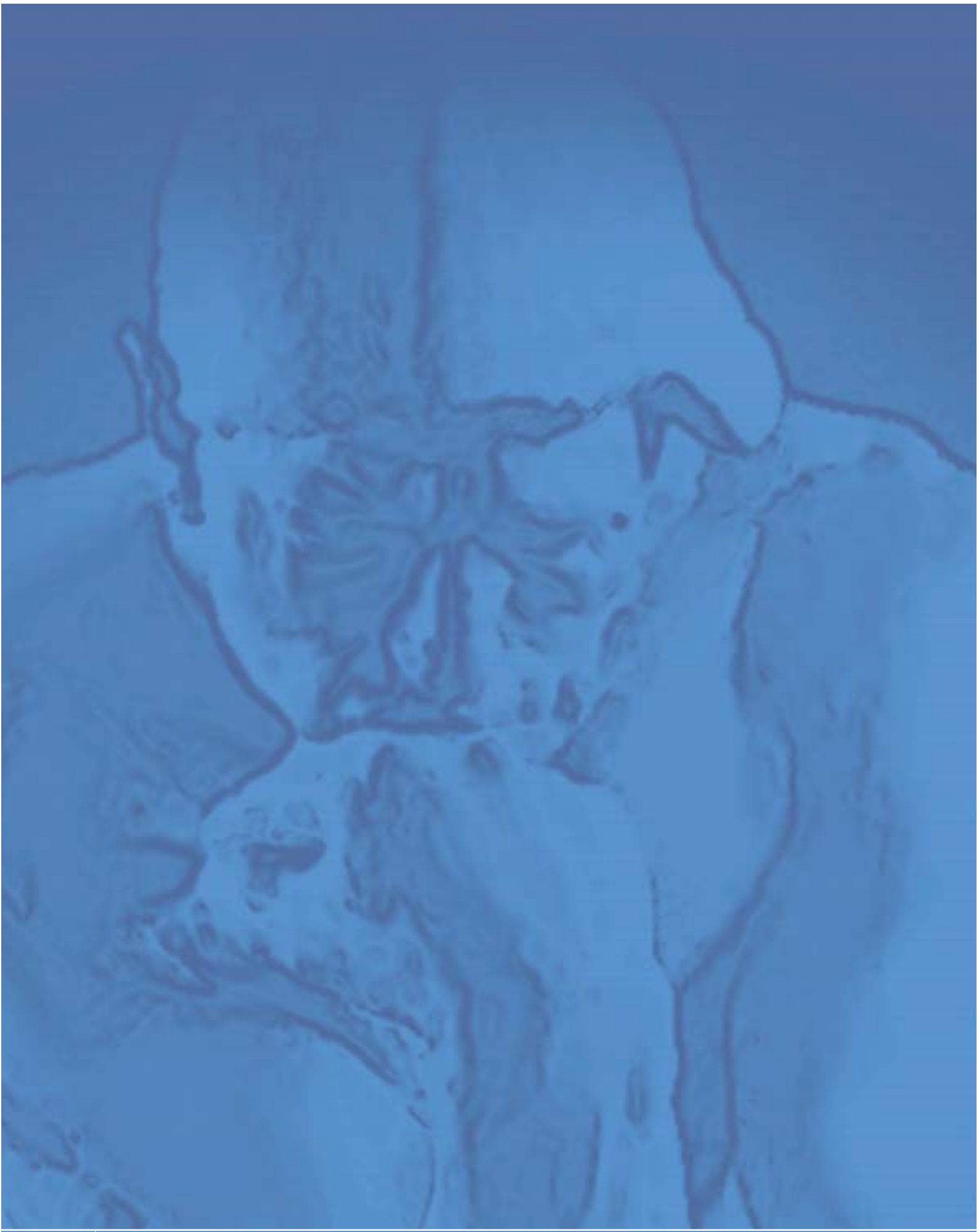
Product Catalog

Laboratory and Portable Meters

Knick

Knick. Always better.



Perfection as a program.

For mobile liquid measurement, Knick has developed the pioneering Portamess® Series for pH value, conductivity and saturation. In addition to a basic unit, a unit with real-time clock, data storage, and interface to PC is provided for each process variable.
Knick laboratory meters are available for pH and conductivity measurement. They stand for safety, reliable workmanship, and easy handling. No other pH meter is as easy to operate as the Knick Model 766 Laboratory pH Meter. The meter monitors itself as well as the pH sensor. Calibration is performed automatically using Knick Calimatic®.

Portable Meters

Portamess 913 (X) pH

High-quality, portable pH meter with data logger and interface for printer and PC.

Portamess 911 (X) pH

Basic unit for mobile high-precision pH measurement.

Portamess 913 (X) Cond

High-quality, portable conductivity meter with data logger and interface for printer and PC.

Portamess 911 (X) Cond

Basic unit for mobile high-precision conductivity measurement.

Portamess 913 Oxy

High-quality, portable dissolved-oxygen meter with data logger and interface for printer and PC.

Portamess 911 Oxy

Basic unit for mobile high-precision oxygen measurement.

Laboratory Meters

765 Laboratory pH Meter

with RS-232 interface and all features for ISO 9000 documentation.

766 Laboratory pH Meter

Standard pH meter for all applications in everyday lab routines.

703 Laboratory Conductivity Meter

for conductivity measurements with highest demands.

Selection matrix

		Portable battery meters										Laboratory meters		
		pH measurement				Conductivity measurement				DO meas.		pH meas.		Cond.
		913 X pH	913 pH	911 X pH	911 pH	913 X Cond	913 Cond	911 X Cond	911 Cond	913 Oxy	911 Oxy	765	766	703
Process variables	mV/ORP measurement	■	■	■	■							■	■	
	Conductivity measurement					■	■	■	■					■
	Salinity determination					■	■	■	■					
	TDS determination					■	■	■	■					
	Dissolved oxygen meas.									■	■			
	Temperature measurement/ compensation	■	■	■	■	■	■	■	■	■	■	■	■	■
	Pressure compensation									■	■			
Functions and features	Documentation to GLP/ISO 9000	■	■			■	■			■		■		■
	PC interface	■	■			■	■			■		■		■
	PC software included	■	■			■	■			■				
	Printer control directly from the meter	■	■			■	■			■		■		■
	Data memory	■	■			■	■			■				
	Data logger	■	■			■	■			■				
	Date / clock function	■	■			■	■			■		■		■
	Automatic self-test	■	■	■	■	■	■	■	■	■	■	■	■	■
	Zone 1(0) application	■		■		■		■						
	Calimatic® automatic calibration	■	■	■	■							■	■	
	Automatic temp probe recognition	■	■	■	■	■	■	■	■	■	■	■	■	■
	Sensoface® information on sensor status	■	■	■	■	■	■	■	■	■	■	■	■	■
	Simultaneous display of primary value and temp	■	■	■	■	■	■	■	■	■	■	■	■	■
	Trueline® analog recorder output											■	■	■
	Sensor statistics											■		
	Water-proof to IP 66	■	■	■	■	■	■	■	■	■	■			
	Protective cover with short instructions	■	■	■	■	■	■	■	■	■	■			
	Auto switch-off	■	■	■	■	■	■	■	■	■	■			
Accessories	Field case	■	■	■	■	■	■	■	■	■	■			
	Matrix printer	■	■			■	■			■		■		■
	Attachable stand with stirrer control											■	■	■
	Immersion stirrer											■	■	■
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Discourse

Portable Meters

Laboratory Meters

pH

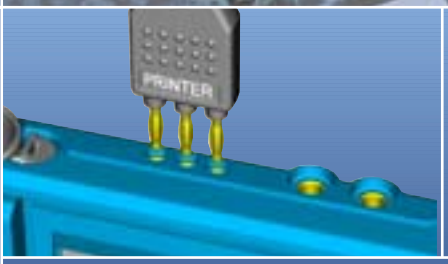
Cond

Oxy

pH

Cond

The Company



Knick.

The name Knick has been recognized for outstanding quality in the manufacture of electronic measuring instruments for more than half a century. Back in 1945 the company's founder, engineer Ulrich Knick, began with the manufacture of high-precision zero-point-stabilized DC amplifiers. These enabled the production of reliable laboratory pH meters and other precision measuring instrument.

Today, company policy still focuses on a high technical level and a highly innovative orientation. Every fifth employee works in Research and Development. A large number of patents and licensing agreements are the result.

The current production at Knick includes pioneering instruments for measurement and control. A great deal of emphasis is placed on EMC and explosion protection, where the firm has made a name for itself by demonstrating its competence. For example, Knick also produces portable meters for hazardous-area applications.

Always better.

Knick is the market leader in many specialized areas of measuring and control engineering, for example in the field of galvanic isolation, in pH measuring technology, and for loop-powered digital indicators.

The Knick product range does not include a single conventional product. Each product provides patented features with substantial advantages for the customer.

Knick products are used throughout the chemical industry, in biotechnology and pharmaceutical industry, in food and beverage industry, in system engineering, in water and waste-water treatment, for environmental protection and industrial automation. Agents all over Europe and in the most important industrial countries abroad ensure world-wide distribution of pioneering Knick technology.

Since 1993 Knick has been certified to ISO 9001.

Knick. Chronology of Innovations.

1945
First zero-point-stabilized modulated DC amplifier

1956
First laboratory pH meter with zero-point-stabilized Knick amplifier

1958
First zero point stabilized chopperless pH amplifier

1960
First transistorized chopper amplifier for measuring and control engineering

1964
First Knick amplifier for hazardous-area applications

1964
First DC transformer for passive isolation in measuring and control engineering

1979
First microprocessor-controlled pH meter with automatic electrode calibration

1979
First industrial pH meter with digital display for on-site mounting in hazardous locations with a Zone-0 input

1980
First electrodeless conductivity measuring system for hazardous-area applications with PTB-certified sensor

1980
First loop-powered digital indicator for mounting within hazardous locations

1980
First loop-powered DC transformer for mounting within hazardous locations

1985
First retractable probe control for fully aut0omatic pH measurement

1995
First process analyzer for simultaneous measurement of pH and conductivity in hazardous locations

1996
First portable meter for hazardous-area applications with IP 66 protection

1997
First process analyzer with broad-range power supply 20 ... 253 V AC/DC

1998
First terminal with electrical isolation

1999
First isolation amplifier in 12.5 mm modular case with broad-range power supply 20 ... 253 V AC/DC and calibrated range selection

2000
First product line for liquid analysis with PROFIBUS®-PA interface and "Profile for Process Control Devices"

1965
First zero-point-stabilized industrial pH transmitters for hazardous-area applications

1967
First portable pH meter for hazardous-area applications (5000 operating hours without battery replacement)

1969
First compact digital pH meter

1972
First DC isolation amplifier from Knick for active isolation in measuring and control engineering.

1973
First portable pH meter with digital display and automatic sensor control (2500 measurements without battery-replacement)

1976
First industrial pH transmitter for applications in the maximum danger area Zone 0

1986
First system-capable DC calibrators in the DM 2000 class

1988
Laboratory conductivity meter with 4-ring electrode and a new circuit principle that for the first time enables measurements in the 1 µS/cm ... 1000 mS/cm range with a single cell

1991
First loop-powered digital indicator with EMC to NAMUR

1992
First laboratory pH meter with complete self-monitoring including electrode and EMC to NAMUR

1992
First analyzer line with EMC and user interface to NAMUR

1995
First portable pH meter with data logger and PC interface

2001
First modular process analyzer in hygienic stainless steel enclosure

2002
First portable meter for measuring dissolved oxygen with flow-free sensors

2002
First active isolation amplifier with 3-port isolation in 6 mm enclosure

2003
First remote-calibration probe with maintenance-free ceramic sealing

2003
First measuring system for fully automatic pH measurement in hygienic locations

2003
First repeater power supply in 6 mm enclosure

pH measurement in the lab and in the field

Requirements for laboratories are constantly becoming stricter. On the one hand, more and more measuring results have to be obtained in shorter times and on the other measurement deviations should become fewer. This also applies for pH measurements. The results should have at least two decimal places, be reproducible, documented and of course be prepared for further processing and archiving on a PC.

These tasks require a pH meter which the user can rely on and which also does the largest part of his work for him.

Knick set reliability and easy handling as top priorities in the development of the Models 765 and 766 laboratory pH meters. These pH meters support the user's work not only by processing the measured values correctly, but also by providing an operating concept which to a great extent prevents handling errors and systematic errors with messages and intelligent routines.

The same requirements are often placed on mobile measurements in the field so that the measurement capabilities of portable meters are very similar to those of laboratory meters. Nowadays, many portable meters provide the same measurement accuracy as lab meters. In addition, the mobile use generates particular demands on handling and mechanical characteristics, such as shape, size, robustness, tightness, etc.

As part of the Portamess® Series, Knick offers the portable pH meters 913 and 911 pH, which combine accuracy and flexibility of a lab meter with an enclosure design specially developed for field applications.
In practice, the unit convinces with a multitude of details: the protective cover with short instructions, the integrated quiver for storing the electrode, the water-proof enclosure, and many more. As an extraordinary feature: Knick also offers hazardous-area variants of these units for measurements even in Zone 0 locations.

The following article looks at the special requirements and problems of pH measurement and describes the solutions provided by the respective Knick meters.

Problems with pH measurements

Measured value deviations (errors) cannot be avoided in any measuring task. Here, statistical deviations (incidental deviations) are distinguished from systematic deviations (recurring deviations).

With pH measurements, most of the errors which are caused by the measuring equipment (pH meter and electrode) and its systematic structure should be counted as systematic deviations. The statistical deviations are mainly caused by measuring equipment handling and operating errors.

Systematic problems

Perfect condition of the measuring equipment – consisting of the pH electrode, temperature probe, pH meter, and also the buffer solutions – is the basis for reliable measuring results. In practice, different influences do however cause changes to the measuring equipment.

Impurities on the electrode

Besides other errors caused by impurities, fault voltages on the reference electrode junction are particularly frequent and influential. These junction voltages can have various causes. They can be related to the process medium, also in particular to the pH value, and are variable. As a part of the electrode voltage, they mostly remain unnoticed in a calibration and are "incorporated" in the calibration. Because of their unknown origin, their dependance on the process medium, and their variability, they still lead to errors even after a calibration.

Junction voltages can only be recognized with comparative measurements using special solutions. They are not recognized automatically. The pH meter cannot provide warnings or help when there are fault voltages on the junction. Here, the user has to rely on his own knowledge and caution or advice. However, he can counteract the error-causing impurities on the electrode with numerous measures, such as cleaning, rinsing, etc.

On pH meters from Knick, Sensoface® will help you assess the condition of the electrode. This automatic electrode monitoring system provides the user with information on the electrode condition. The zero point, slope, and response time of the electrode and the calibration timer are evaluated.

Three Sensoface® icons summarize the individual evaluations of these parameters.

– The electrode is in good condition.

– The electrode is still usable, but should be calibrated.

– The electrode should absolutely be checked and calibrated.

The zero, slope, and response time parameters can only be calculated during calibration, whereas the cal timer is evaluated during measurement. The meter displays the evaluation of all individual parameters in the diagnostics menu at the press of a key.

If the Sensoface® icon does not return to the "good status" after you have taken the appropriate measures, for example calibration, the electrode should be replaced.

Electrode wear

No matter how well an electrode is treated and cared for, it will always show signs of aging and wear at some stage. Aging and wear mainly depend on the measured medium and the measuring temperature and can affect the electrode in different ways.

In the past, the user had to enter all calibration data in a logbook or a lab journal in order to assess the aging process of the electrode. On the Model 765, the electrode statistics system stores the zero, slope, and response time from the last three calibration procedures with the respective date and accompanying time. In adition, the data from the first calibration carried out with the electrode on the lab pH meter
is stored. The user can use the electrode statistics to assess the performance of the electrode over its complete lifespan. Records can be printed out for documentation or the data transferred to a PC.

Error-free status of the meter

The user does not have to assess the general device status, only the calibration status. A modern lab or portable pH meter can inform the user about the device status. The meter must provide routines which automatically check all required criteria.
The lab and portable meters from Knick provide several self-test routines which run automatically at power-on. They check the operability of the hardware as well as the intactness of the device software (firmware). The display plays a special role: If, for example, a digit segment fails without being noticed, measured values may be displayed incorrectly. To prevent that, all display segments including the icons are switched on during the display test. This allows an easy optical inspection by the user.
These self-monitoring features – Gaincheck® for Models 911/913 and Fullcheck® for 765 Laboratory pH Meter – ensure a reliable identification of device faults. Once the device self-test has been successfully concluded, the user can assume that the meter is in full working order according to the tested criteria.

Frequent handling errors

A pH meter can measure accurately but it cannot prevent the user from making handling errors. This includes errors like, for example, calibration with impure or spoilt buffers and also not calibrating the meter in time. A modern pH meter can, however, help prevent handling errors with clear messages and a straightforward user guidance.

Calibration intervals

The time intervals after which calibration should be carried out depend on the measured medium and the measuring temperature and are based on empirical values. As a general rule, it is better to calibrate the unit too early than too late. Users often forget to calibrate the unit in time or, for example, after a shift change no one is sure when the last calibration was carried out.
Up to now, this problem could only be counteracted by applying the GLP recommendations (Good Laboratory Practice). Calibrations had to be documented in a logbook and calibration intervals had to be observed. This did not, however, guarantee that calibration was carried out according to these directions.

The cal timer on the 765 Laboratory pH Meter and the 913 pH Portable Meter reminds the user when calibration is due. The time interval for the calibration can be preset. This interval should be sufficiently short taking the type of measured medium, the measuring temperatures, and the qualitative requirements for measuring results into consideration. Measurements in different media with pH values and temperatures which deviate greatly from one another, for example, require shorter calibration intervals than measurements in media with similar pH values at similar temperatures. Once approx. 80 % of the set interval has expired, the cal timer will switch the Sensoface® indicator from "good" to "average". The meter should now be calibrated. Once the total interval has expired, the indicator is set to "poor". The meter should be calibrated now at the latest.

This check reminds the user in good time when calibration needs to be carried out and allows him/her to concentrate fully on the actual measuring work.

Perfect buffer solutions

One basic requirement for correct pH measurements is using perfect buffer solutions which have not passed their expiry date. Here, we strongly advise the user to follow the GLP recommendations and ensure that the buffer solutions used are always fresh, undiluted, and clean. Therefore, the pH electrode must never be immersed directly in the buffer bottle. A sufficient amount of buffer must be filled in a clean beaker. Then the electrode can be immersed in the solution. Anyone not observing these requirements will obtain unusable measurement results.

There is, however, a simple solution also to this problem. Knick supplies buffer solutions in disposable bags as accessories. The buffer solutions are sufficient for exactly one calibration procedure and are sealed. After calibration they are simply disposed of. This guarantees perfect buffer solutions.

Calibration procedure

Handling errors cannot be ruled out during calibration. The user could, for example, leave out certain steps or mix up buffers. Here as well only strict following of the GLP recommendations could prevent errors.
This is no longer a problem with the Calimatic®. The user is guided safely through the calibration procedure. All necessary steps are indicated. The buffers can be placed in any order. The Calimatic® automatically assigns the buffer solution being used to the buffer set in the unit, measures the response time, calculates the zero and slope of the electrode and makes the necessary adjustments. The Sensoface® icons tell the user whether calibration was concluded successfully or whether it needs to be repeated.

Calibration in the expected range of the measured medium

To obtain measurement results with lowest possible measured value deviations, it is important to know the range of the expected measured values on the pH scale.
The slope of the electrode is presumed to be linear. In practice, however, there are deviations from the straight line. These deviations become smaller if a 2-point calibration incorporates (brackets) the pH range in which measurements are being taken as close as possible. For example, if the measured value is expected to be between pH 5 and pH 6, calibration should be carried out with pH 4.01 and pH 7.00 buffers.

Observing the calibration and measuring temperature

A pH value is only useful if it is given together with the temperature of the measured medium. These values form a value pair. For best results, the calibration and measuring temperature should be the same. If that is not the case, the temperature difference must be taken into consideration.

The slope is then adjusted accordingly by the meter.

The temperature sensitivity of the measured medium is mostly unknown and cannot be taken into consideration in normal laboratory conditions. The temperature sensitivity of the buffer solutions is known however and must be taken into consideration during calibration. The pH values for the different temperatures used to have to be read off the buffer containers.

The temperature sensitivities of seven commonly used buffer sets are stored in the lab and portable meters from Knick. The calibration temperature is calculated automatically or can be entered manually. The correct buffer value for the temperature is thus automatically taken over during calibration. The requirement for this is of course that the buffer solutions are in perfect condition.

Documentation duty

Since the introduction of ISO 9000 at the latest it has been necessary not only to ensure perfect condition of the measuring equipment but to also document this. This is also stipulated by GLP directives.

Any documentation is time consuming and incurs costs. To keep these to a minimum for the user, the units with interface (765 Laboratory pH Meter and 913 (X) pH portable meter) provide records of the last calibration, the device diagnostics, and the configuration. When a printer is connected, these records can be printed out at the push of a button. If the unit is provided with the electrode statistics option, the last three calibration procedures and the first calibration of the electrode can be displayed and printed out. The data can be read out via the RS 232 interface and processed further on a PC.

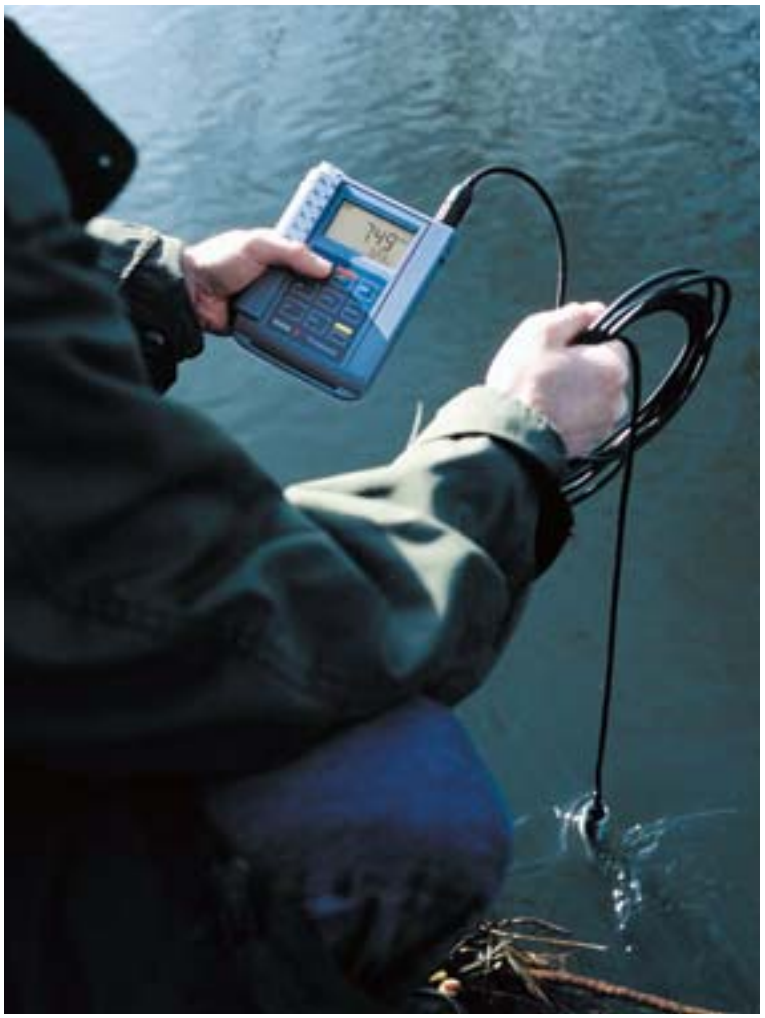
With the portable meters, you often have to take many measurements in the field, which must be carefully documented. The Model 913 (X) pH provides a storage for up to 100 measured values with date and time. Back in the lab, these data can be read out on a PC or directly documented with a printer. For this purpose, Knick offers a matrix printer for standard paper. This ensures that the measured values remain legible for years since bleaching thermal paper printouts do not satisfy the documentation requirements in the most cases.

Conclusion

The increasing requirements for laboratories also burden the user more and more and increase the number of tasks he has. This results in less time being left to work on the actual measuring task.
Knick supports the user with elaborate and practical solutions in its lab and portable units. Many features are provided to ensure accurate measurements conforming to GLP: Sensoface® provides information on the electrode status, the electrode statistics show the aging process of the electrode, Fullcheck® and Gaincheck® check the meter, the cal timer monitors calibration intervals, the Calimatic® ensures that calibration is carried out correctly and the record function provides the necessary documentation. Using this kind of pH meter simplifies the user's measuring tasks substantially.

Knick pH meters do not change the pH measurement and also do not make it completely free of deviations which in any case is physically impossible. But they make pH measurement safer, easier, and comprehensible for the user and with their consistent design concept, they help to prevent errors.

This design philosophy focusing on quality, accuracy, and easy handling has also been implemented in the development of the conductivity and dissolved oxygen meters from Knick. The user interfaces of these devices are similar to those of the pH meters and therefore as easy to handle.
With its high-quality lab and portable meters, Knick decisively contributes to making liquid analysis more controlled and more reliable in laboratories as well as in the field.



Portable Meters

pH/Cond/Oxy

Portable Meters

pH/ORP Measurement

Conductivity Measurement

Oxygen Measurement

Portamess® pH

Original size

A clear concept. The portable pH meters of the Portamess® pH Series.

Providing the functional abundance of high-quality benchtop meters with easy, icon-guided operation. Compact construction. Comfortable handling.

Robust enclosure, protected against strong jets of water. Appealing design. Extremely flat. Constructed for a firm grip.

Applications

Most versatile hazardous and safe-area applications, such as in industry, in the lab, for environmental protection, food processing, as well as water and wastewater measurements.

bundespreis produktdesign

Warranty
3 years!

Defects occurring within 3 years from delivery date shall be remedied free of charge at our plant (carriage and insurance paid by sender). Sensors and accessories: 1 year

The facts

- Also available for use in hazardous area ATEX II2(1)G EEx ia IIC T4 ... T6, measurement in category 1 / Zone 0 possible
- Calimatic® automatically recognizes the right buffer – automatic calibration at the press of a button
- 8 buffer sets to choose from
- Simultaneous pH/mV and temperature display
- Automatic device test during power-on
- Sensoface® electrode monitoring
- Temperature detection with automatic Pt 1000 / NTC 30 kOhm recognition
- 2000 operating hours on just 3 AA batteries
- Battery indicator
- Auto switch-off
- EMC design

Portamess® 913 (X) pH

Portamess® 913 pH
Fit for digital communication.
Pioneering.
Remote-controllable.

The keys

Smooth membrane keypad. Durable. Easy to clean. No sticking or crusty deposits.

The display

Large (15 mm character height). Easy-to-read LC display. Anti-reflection natural glass. Scratch-proof and resistant to chemicals. Clear icons for operator guidance. Sensoface®: Electrode diagnostics with "Smileys".

The quiver

Integrated. Replaceable. Protects the electrode. Transparent. Easy to remove.

The enclosure

Blue. Ergonomic. Resistant to impact and chemicals. Diecast chassis. Water-tight (IP 66 protection).

The cover

Protects against dirt and damage. Highly flexible lamellar joint. Can be folded back completely. Instructions on the back.

The hook

Fold-out. For hanging or standing up.
Keeps both hands free for handling the electrode.

The sockets

Robust. Water-tight. Gold-plated.

The carrying strap

Practical. Adjustable. Fixed directly to the meter.

The clock

Integrated real-time clock. With date.

The calibration

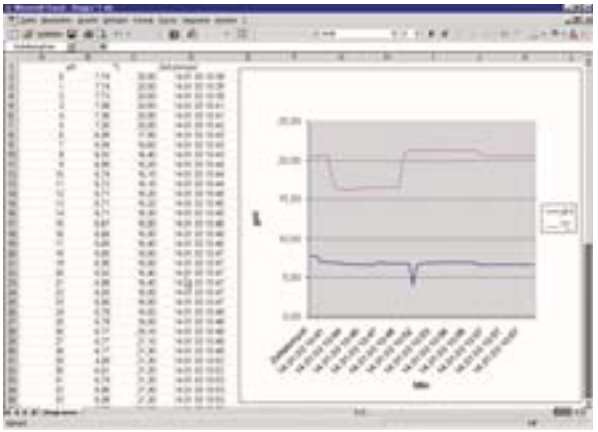
1-, 2-, and 3-point calibration. Calimatic® automatically recognizes the right buffer. 8 buffer sets to choose from. Also manual calibration possible. With any two buffers.

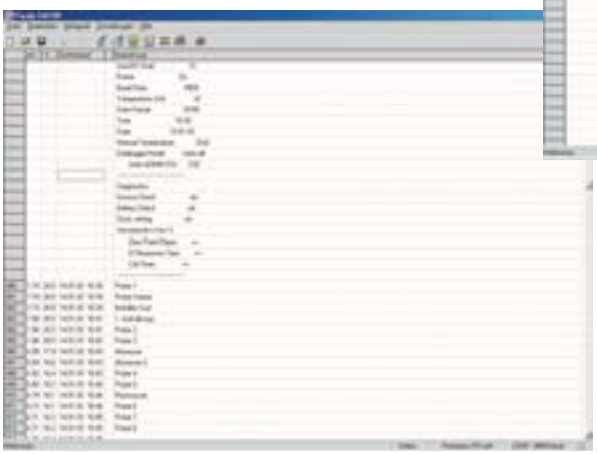
The memory

Manual storage. Direct access via 2 keys. 100 measured values including temperature, memory location number, time, and date.

The data logger

Unique. Automatic recording of measured values over longer periods. Manual (with STO key), interval (e. g. every 30 min.) or event-controlled (based on a measured value difference – this function prevents unnecessary memory consumption). Combined with a PC, the meter can continuously record any amount of data.





The interface

Serial. Either for printer or PC simply by turning plug around. Saves paperwork, prevents manual transcription errors. Supplies records for QM documentation (ISO 9000 and GLP). Portamess® 913 pH can be completely remote controlled via interface.

The software

Convenient. Paraly® SW 109 transfer software. Transfers measured values to the PC.

Comfortable documentation and further processing (e. g. with Microsoft Excel). Data logger function. Remote control of all device functions.

Original size

Warranty
3 years!

Portamess® 911 (X) pH

Portamess® 911 pH
The basic unit for mobile pH measurement. Uncomplicated. Completely safe.

The keys

Smooth membrane keypad. Durable. Easy to clean. No sticking or crusty deposits.

The display

Large (15 mm character height). Easy-to-read LC display. Antireflection natural glass. Scratch-proof and resistant to chemicals. Clear icons for operator guidance. Sensoface®: Electrode diagnostics with "Smileys".

The quiver

Integrated. Replaceable. Protects the electrode. Transparent. Easy to remove.

The enclosure

Blue. Ergonomic. Resistant to impact and chemicals. Diecast chassis. Water-tight (IP 66 protection).

The cover

Protects against dirt and damage. Highly flexible lamellar joint. Can be folded back completely. Instructions on the back.

The hook

Fold-out. For hanging or standing up. Keeps both hands free for handling the electrode.

The sockets

Robust. Water-tight. Gold-plated.

The carrying strap

Practical. Adjustable. Fixed directly to the meter.

The calibration

1-, 2-, and 3-point calibration. Calimatic® automatically recognizes the right buffer. 8 buffer sets to choose from. Also manual calibration possible. With any two buffers.

Original size

Warranty
3 years!

Specifications Portamess® 913 (X) pH

Portamess® 913 (X) pH

Ranges	pH: –2.00 ... +16.00; mV: –1300 ... +1300; °C: –20.0 ... +120.0
Accuracy (± 1 count)	pH: < 0.01; mV: < 0.1 % meas.val. ±0.3 mV; °C: < 0.3 K
Electrode standardization	1-, 2-, or 3-point calibration, Calimatic® automatic calibration and buffer identification (German patent 29 37 227) 8 buffer sets to choose from*) see table, also manual calibration possible
Temperature compensation	Pt 1000 / NTC 30 kOhm (automatic recognition at power-on) or manual
EMC directive	89/336/EEC
EMC standard	EN 61326 / VDE 0843 Part 20: 2002-3
Explosion protection (for ⟨Ex⟩ versions only)	II2(1)G EEx ia IIC T4 ... T6 according to EC Directive 94 / 9 / EC, PTB 01 ATEX 2162 X
Device self-test	Automatic at power-on
Data retention	Parameters and calibration data > 10 years (EEPROM)
Ambient conditions	Operating/ambient temp –10 ... +55 °C; Transport and storage temp –10 ... +70 °C
Display	LC display 67 x 67 mm, character height 15 mm; measured value display: pH, mV, °C
Power supply	3 alkaline AA batteries, autom. switch-off after 1 h or 12 h, selectable
Operating time	2000 h with 3 AA cells
Enclosure	Material: PA, IP 66 protected, with integrated electrode quiver
Dimensions	133 x 160 x 30 mm (W x H x D)
Weight	Approx. 560 g including batteries
Data memory	100 memory locations: pH/mV, °C, time and date
Clock	Integrated real-time clock with date
Data logger*)	100 data records, manual, interval, or event-controlled recording
Interface	RS 232C, serial, bidirectional, asynchronous, 600 ... 9600 bauds, configurable as printer or computer interface, data transfer for QM documentation (ISO 9000 and GLP).
Interface cable	Length 2 m, universal plug, either for PC or printer connection
Software	SW 109 transfer software: Recording of measurement data, memory contents and device records in tabular form, allows entering notes for each measured value (e. g. tag number), data transfer to other Windows applications (e. g. Excel), data-logger function, remote control of all device functions, included in supply. Control of Model 913 pH is integrated in the automation software for lab meters "labworldsoft" (Fisher Scientific) for display and control of device functions of Version 4.0 or higher.

*) Configurable

Specifications Portamess® 911 (X) pH

Portamess® 911 (X) pH

Ranges	pH: –2.00 ... +16.00; mV: –1300 ... +1300; °C: –20.0 ... +120.0
Accuracy (± 1 count)	pH: < 0.01; mV: < 0.1 % meas.val. ±0.3 mV; °C: < 0.3 K
Electrode standardization	1-, 2-, or 3-point calibration, Calimatic® automatic calibration and buffer identification (German patent 29 37 227) 8 buffer sets to choose from*) see table, also manual calibration possible
Temperature compensation	Pt 1000 / NTC 30 kOhm (automatic recognition at power-on) or manual
EMC directive	89/336/EEC
EMC standard	EN 61326 / VDE 0843 Part 20: 2002-3
Explosion protection (for Ex versions only)	II2(1)G EEx ia IIC T4 ... T6 according to EC Directive 94/9/EC, PTB 01 ATEX 2162 X
Self-test	Automatic at power-on
Data retention	Parameters and calibration data > 10 years (EEPROM)
Ambient conditions	Operating/ambient temp –10 ... +55 °C; Transport and storage temp –10 ... +70 °C
Display	LC display 67 x 67 mm, character height 15 mm; measured value display: pH, mV, °C
Power supply	3 alkaline AA batteries, autom. switch-off after 1 h
Operating time	2000 h with 3 AA cells
Enclosure	Material: PA, IP 66 protected, with integrated electrode quiver
Dimensions	133 x 160 x 30 mm (W x H x D)
Weight	Approx. 560 g including batteries

*) Configurable

Buffer sets

Buffer set – 00 –	Knick technical buffers: pH 2.00/4.01/7.00/9.21
Buffer set – 01 –	Mettler-Toledo (Ingold) technical buffers: pH 2.00/4.01/7.00/9.21
Buffer set – 02 –	Merck, Riedel: pH 2.00/4.00/7.00/9.00/12.00
Buffer set – 03 –	DIN 19 267: pH 1.09/4.65/6.79/9.23/12.75
Buffer set – 04 –	Ciba (94): pH 2.06/4.00/7.00/10.00
Buffer set – 05 –	NIST: pH 1.68/4.00/7.00/10.01/12.46
Buffer set – 06 –	DIN 19 266 and NIST (NBS): pH 1.679/4.006/6.865/9.180
Buffer set – 07 –	HACH: pH 4.00/7.00/10.18

Combination pH electrodes for lab and field units

The Model SE 102 with glass body is an inexpensive combination electrode with Pt 1000 temperature probe and refillable electrolyte. For use in rougher environments, Knick offers the SE 101 electrode with plastic body. It is also equipped with an integrated Pt 1000 temperature probe and gel electrolyte. In addition, Knick also offers the SE 104 puncture electrode. This gel-filled combination electrode is particularly robust and insensitive to pollution. Therefore, it is suited especially for measurements in semi-solid substances such as meat or cheese. The sensors are equipped with a handy electrode cap with O-ring, which securely fixes the sensor in the quiver of the Models 913 pH and 911 pH.

Specifications Combination pH electrodes

Combination pH electrodes	SE 101	SE 102	SE 104
Temperature probe	Pt 1000	Pt 1000	–
Body material	Plastic (PEEK)	Glass	Plastic (PEEK)
Body length	110 mm	110 mm	99 mm
Body diameter	12 mm	12 mm	6 ... 16 mm
Junction	2-hole junction	Ceramic	Hole junction
Electrolyte	Polymer	3 mol/l KCl, refillable	Polymer
pH measurement range	0 … 14	0 … 14	2 … 11
Temperature range	0 … 80 °C	0 … 80 °C	0 … 80 °C
Recommended temp probe	Integrated	Integrated	ZU 0156
Remarks	–	–	Puncture electrode
Order No.	**SE 101**	**SE 102**	**SE 104**

Product line Portable pH meters and combination pH electrodes

		Order No.
Portamess® 913 pH 	With clock, data memory, data logger, remote interface, as well as Paraly® SW 109 transfer software and interface cable, including batteries, electrode quiver, and carrying strap, without electrode.	**913 pH**
Portamess® 913 X pH 	Ex - unit with clock, data memory, data logger, remote interface as well as Paraly® SW 109 transfer software and interface cable, including batteries, electrode quiver, and carrying strap, without electrode.	**913 X pH**
Portamess® 911 pH 	Unit including batteries, electrode quiver, and carrying strap, without electrode.	**911 pH**
Portamess® 911 X pH 	Ex - unit including batteries, electrode quiver, and carrying strap, without electrode.	**911 X pH**
pH/Pt 1000 combination electrode 	Plastic body, length 110 mm	**SE 101**
pH/Pt 1000 combination electrode 	Glass body, length 110 mm	**SE 102**
Combination pH puncture electrode 	Plastic body, length 99 mm	**SE 104**
pH/Pt 1000 combination electrode 	For measurements in hazardous areas Zone 0, including equipotential bonding cable	**ZU 6979**

Product line Accessories

		Order No.
pH-Set A 	For measurement in generally watery media (e. g. waste water, aquariums, swimming pools) and in water-based varnishes, paints, emulsions and suspensions. Suitable for field measurements, changing temperature and temperature-compensated measurements. Robust field case for meter and electrode including SE 101 combination pH/Pt 1000 electrode (plastic body), one bag each of Knick technical buffer solutions pH 4, 7, 9 and replacement electrode quiver.	**ZU 0510**
pH-Set B 	For measurement in generally watery media, biological media, photographic chemicals, hot alkaline solutions, media containing sulfids, corrosive acid and alkaline solutions. For extreme pH values, high temperatures, temperature-compensated and high-precision measurements. Robust field case for meter and electrode including SE 102 pH/Pt 1000 combination electrode (glass body), one bag each of Knick technical buffer solutions pH 4, 7, 9 and replacement electrode quiver.	**ZU 0511**
pH-Set C 	For puncture measurements (including in foodstuffs such as meat, fruit, and milk products). Also suitable for measuring soil samples. Robust field case for meter and electrode including SE 104 pH puncture electrode, one bag each of Knick technical buffer solutions pH 4, 7, 9 and replacement electrode quiver.	**ZU 0512**
Electrode quiver 	5 quivers, as replacement, for leak-proof storage of electrodes	**ZU 0262**
Robust field case 	For meter and sensor	**ZU 0277**
Lab printer 	With the Lab Printer, you can document your measured values either at the press of a key or timer-controlled. Also records for QM documentation to ISO 9000 and GLP can be printed out with a single keystroke. The printer is equipped with a replaceable ribbon cartridge and prints on standard paper.	**ZU 0244**
Printer paper 	For ZU 0244 Lab Printer, 5 rolls	**ZU 0249**
Ink ribbon 	For ZU 0244 Lab Printer, 5 ribbons	**ZU 0250**

Product line Sensors and buffer solutions

		Order No.
Pt 1000 temperature probe 	For fast response temperature measurements: stainless steel, –10 ... +100 °C), accuracy class A to IEC 751	**ZU 6959**
Pt 1000 temperature probe 	For fast response temperature measurements, with tilted tip for puncture measurements in semi-solid substances: glass, 0 ... +80 °C, pH 0 ... 14, accuracy class A to IEC 751	**ZU 0156**
Calibration buffer set 	With Knick technical buffer solutions, 250 ml each of pH 4.01, pH 7.00, pH 9.21, and KCI solution	**ZU 0261**
Calibration buffer set 	With standard buffer solutions to DIN 19266 and NIST (NBS), 250 ml each of pH 4, pH 7, and KCI solution	**ZU 6941**
KCI solution 	250 ml bottle	**ZU 0062**
Knick technical buffers 	pH 4.01 (set with 30 bags for one calibration each)	**ZU 0263**
	pH 7.00 (set with 30 bags for one calibration each)	**ZU 0264**
	pH 9.21 (set with 30 bags for one calibration each)	**ZU 0265**
	pH 4.01 (1000 ml)	**ZU 0200**
	pH 7.00 (1000 ml)	**ZU 0201**
	pH 9.21 (1000 ml)	**ZU 0202**

Certificates of Conformity

print preview

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

PTB

EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

PTB 01 ATEX 2162 X

(4) Equipment: Battery-pH-meter Portamess, type 91. X pH

(5) Manufacturer: Knick Elektronische Messgeräte GmbH & Co.

(6) Address: Beuckestr. 22, 14163 Berlin, Germany

(12) The marking of the equipment shall include the following:

II 2 (1) G EEx ia IIC T4 ... T6

Braunschweig, January 24, 2002

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

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Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

PTB

SCHEDULE

(14) EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 2162 X

(15) Description of equipment

The battery-pH-meter Portamess, type 91. X pH, is primarily used for pH, redox, and temperature measurement in the electrochemical and environmental field.

Pt-1000 or NTC sensors, which may be installed separately or be mounted in the measuring cell, provide for general precise temperature measurements and automatic temperature compensation while pH values are measured.

Use as category-1/2 equipment is only permissible in conjunction with the pH/Pt 1000 combined measuring and reference electrode, type ZU 6979 X0.

Category-1/2 equipment

The battery-pH-meter Portamess, type 91. X pH, is used in potentially explosive atmospheres requiring category-2 equipment.

The pH/Pt 1000 combined measuring and reference electrode, type ZU 6979 X0, is connected to the BU 2 socket of the unit and is installed in potentially explosive atmospheres requiring category-1 equipment.

For applications requiring category-1/2 apparatus, the permissible ambient temperature as well as the media process pressure has to range from -20 °C to 60 °C, and from 0.8 to 1.1 bar, respectively. Should these conditions not be met at the measuring sensor, it has to be considered that the measuring sensor (even in case of faults) does not show any self-heating effect. It should also be noted that the plant owner is responsible for safe operation of the plant as regards the pressure/temperature of the materials used. For the operating conditions when used without explosive mixtures, reference shall be made to the specifications provided by the manufacturer.

Category-2 equipment

The battery-pH-meter Portamess, type 91. X pH, the measuring cell, and the separate or mounted Pt 1000 and NTC sensors are installed in potentially explosive atmospheres for category-2 equipment.

For the relationship between temperature class and the permissible ambient temperature range, reference is made to the following table:

Temperature class	Permissible ambient temperature range
T6	- 10 °C ... 40 °C
T5	- 10 °C ... 40 °C
T4	- 10 °C ... 55 °C

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SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 2162 X

Electrical data

Auxiliary power ..... 3 batteries Varta Universal Alkaline No. 4006, type Mignon, model LR6-AA-AM0 (alkali-manganese)
or 3 batteries Varta Universal Alkaline No. 8006, type Mignon, model LR6-AA-AM0 (alkali-manganese)
or 3 batteries Varta Standard No. 3706, type Mignon, model AA (zinc-chloride)

pH/temperature measuring circuits (BU 2, 3, 4) ..... type of protection Intrinsic Safety EEx ia IIC
Maximum values:
U_o = 5 V
I_o = 11 mA
P_o = 13 mW
R_i = 487 Ω
C_o = 30 nF
L_o negligibly low
C_o = 1.8 µF
L_o = 100 mH

Interface circuits RxD, TxD (BU 5, 6, 7) ..... U_o = 253 V
The serial interface may only be used outside the hazardous area.
When the interface is connected to a circuit, neither the equipment nor the pH-temperature measuring circuit may be positioned inside the hazardous area.

(16) Test report PTB Ex 01-20452

(17) Special conditions for safe use

When used as category-1/2 equipment, the battery pH meter Portamess, type 91. X pH, shall electrostatically (contact resistance ≤ 1 MΩ) be connected to the equipotential bonding conductor (e.g. using the earth terminal).
The pH/Pt 1000 combined measuring and reference electrode, type ZU 6979 X0, may in tanks only briefly be used in zone 0. Reference has to be made to the risk resulting from the release of explosive atmosphere and of flames penetrating from outside.

(18) Essential health and safety requirements

Met by compliance with the above standards.

Braunschweig, January 24, 2002

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

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