

Determining Conductivity: Lab 9xx

Conductivity Meter Lab 960

GLP documentation on highest level: the interface all-rounder

Dual interface included

Whether conventional via RS 232 or modern via USB – both interfaces are integrated in the Lab 960. No adapter is required.

Reliable documentation

All GLP compliant calibration protocols and up to 800 stored data sets with time and identification can be recalled.

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14.03.2008 08:53:54
Lab 960 02320025

CALIBRATION COND
Cal Time : 14.03.2008 08:22:14
Cal Interval: 180d
Cal Std.: 0.01 mol/l KCL
          40.0 °C
Conduct./Tref25: 1413µS/cm
Cell Const : 0.650 1/cm
Probe : +++
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Calibration protocol

USB and RS 232 interfaces



Scope of delivery, set

Conductivity Meter Lab 970

Laboratory practice at its best – GLP with SCHOTT Instruments

▶ Electrode is automatically recognized

Ideally suited for measurements according to USP 28. A measuring instrument that automatically recognizes the electrode! The latest microtechnology enables storing of the calibration data in the sensor. For each measurement the sensor logs in with its ID (type and serial no.) and by sending its calibration data assures that only the sensor specific data are used to calculate the measured value.

Wireless sensor recognition



▶ Direct data transmission

The Lab 970 sends the data directly via USB or RS 232 to PC (no storing function). The instrument is therefore very easy to handle and can be integrated into automated systems such as i.e. LIMS. Extensive administrator levels are not necessary.

▶ Service taken serious

For the Lab 970 also the complete IQ and OQ documentation is available. The service from SCHOTT Instruments is pleased to assist you.

▶ Reliable and precise measuring values

due to perfect matching of the Lab instruments with our conductivity cells and conductivity test solutions.

▶ Fast and easy documentation complying with GLP

through perfect communication via USB (slave) and RS 232

▶ Complete support including IQ and OQ

documentation and qualified service.

▶ Highest safety for measuring and calibrating

through wireless sensor recognition (Lab 970): ID electrodes and meters with automatic identification and data exchange.

▶ Scope of delivery, set

- Measuring instrument
- Conductivity cell
- Conductivity testing solution
- Stand
- Universal power supply unit
- Cover

Advantages
Lab 9xx

Performance black on white ...

Measuring technology in detail...	Lab 850	Lab 860	Lab 870	Lab 960
<i>page</i>	<i>p. 8/9</i>	<i>p. 8/9</i>	<i>p. 8/9</i>	<i>p. 10/11</i>
pH measurement	■	■	■	
Range / Accuracy	-2.000 ... +19.999 pH -2.00 ... +19.99 pH	-2.000 ... +19.999 pH -2.00 ... +19.99 pH	-2.000 ... +19.999 pH -2.00 ... +19.99 pH	
Accuracy (for each measuring area) (±1 digit)	± 0.005 pH ± 0.01 pH	± 0.005 pH ± 0.01 pH	± 0.005 pH ± 0.01 pH	
Calibration: pre-programmed pH buffer sets	16	16	16	
Automatic buffer recognition and display	■	■	■	
pH calibration points max.	3	3	3	
VariCal: manual calibration with selectable buffers	–	–	–	
Dead stop function	–	–	–	
2-channel pH measurement (galvanically separated)	–	–	–	
mV measurement	■	■	■	
Range / Accuracy	-999.9 ... +999.9 mV -1999 ... +1999 mV	-999.9 ... +999.9 mV -1999 ... +1999 mV	-999.9 ... +999.9 mV -1999 ... +1999 mV	
Accuracy (for each measuring area) (±1 digit)	± 0.3 mV ± 1 mV	± 0.3 mV ± 1 mV	± 0.3 mV ± 1 mV	
AutoRange function (can be switched off)	■	■	■	
mV differential measurement	–	–	–	
2-channel mV measurement (galvanically separated)	–	–	–	
ISE measurement				
Range / Accuracy				
Display in %, ppm, mg/kg, mol/l				
Two separate ISE channels (with dedicated separate temperature channels)				
Methods				
ISE calibration points				
Standard concentrations				
Conductivity measurement				■
Range / Accuracy				0.000 µS/cm...500 mS/cm
TDS measurement with factor 0.4 ... 1.0				■
Salinity measurement acc. to Natural Sea Water Scale (UNESCO 1966b)				■
Accuracy in % from measuring value (± 1 digit)				0.5
Calibrated cell constant 0.450 ... 0.500 cm ⁻¹ ; 0.585 ... 0.715 cm ⁻¹ ; 0.800 ... 1.200 cm ⁻¹ (calibration with control standard) d 0.01 mol KCl:				■
Adjustable cell constant 0.250 ... 2.500 cm ⁻¹ and 0.090 ... 0.110 cm ⁻¹				■
Fixed cell constant 0.010 cm ⁻¹				■
Temperature compensation nLF / Lin (0.001 ... 3.000 %/K) / selectable				■
Temperature compensation purity water				■
Pre-programmed temperature coefficients for HCl, NaOH, NaCl and KCl				
Determination of temperature coefficients for one or multiple standards and known or unknown concentrations at various temperatures				
Reference temperature 20°C or 25 °C selectable				■

The technical data continued...

Measuring technology in detail...	Lab 850	Lab 860	Lab 870	Lab 960
<i>page</i>	<i>p. 8/9</i>	<i>p. 8/9</i>	<i>p. 8/9</i>	<i>p. 10/11</i>
D.O. measurement (O₂ dissolved)				
Range / Accuracy:				
O ₂ concentration				
O ₂ saturation				
O ₂ partial pressure				
Accuracy in % from measuring value (±1 digit) at an ambient temperature of 5...30 °C				
Salinity correction				
Calibration in calibration vessel with water vapor-saturated air				
Temperature measurement	■	■	■	■
Range / Accuracy	-5.0 ... +120.0 °C	-5.0 ... +120.0 °C	-5.0 ... +120.0 °C	-5.0 ... +120.0 °C
Accuracy (±1 digit)	± 0.1 °C	± 0.1 °C	± 0.1 °C	± 0.1 °C
Two separated temperature channels	-	-	-	-
Selectable °C / °F (Fahrenheit)	■	■	■	■
Automatic switch-over to manual temperature input when no temperature sensor is connected	■	■	■	■
Design & Quality				
Display	LCD 75 x 60 mm	LCD 75 x 60 mm	LCD 75 x 60 mm	LCD 75 x 60 mm
Contrast adjustment via menu	-	-	-	-
Glass vision panel	-	-	-	-
Vision panel integrated in keyboard plastic foil	■	■	■	■
Measuring value storage (manual/automatic)	-	800 data sets, storage intervals from 5 s ... 60 min	-	800 data sets, storage intervals from 5 s ... 60 min
USB (slave) and RS232 interface		■	■	■
USB host interface: plug and play connection of USB hub, USB printer, USB memory, keyboard, mouse, USB stick				
Lower casing	plastic	plastic	plastic	plastic
Plastic foil keypad (polyester) with tactile response	■	■	■	■
Power supply: external universal power supply unit (medical approval) with country specific primary adapters, (primary: 100-240V, 50/60 Hz, secondary: 9V=1,5A)	■	■	■	■
built-in real-time clock (processor solution) battery buffered, exchangeable battery	■	■	■	■
Battery operation possible (4 mignon)	■	■	■	■
Battery switch-off automatic (adjustable 10 min ... 24 h, default 1 h, cannot be switched off)	■	■	■	■
Dimensions (W x H x D mm)	240 x 190 x 80	240 x 190 x 80	240 x 190 x 80	240 x 190 x 80
Weight	approx. 1.0 kg	approx. 1.0 kg	approx. 1.0 kg	approx. 1.0 kg
Compliance	CE, cETLus	CE, cETLus	CE, cETLus	CE, cETLus
Safety	protection class III, EG guidelines 73/23, EN 61010-1: 2001	protection class III, EG guidelines 73/23, EN 61010-1: 2001	protection class III, EG guidelines 73/23, EN 61010-1: 2001	protection class III, EG guidelines 73/23, EN 61010-1: 2001
Climate class	2 (VDI/VDE 3540)	2 (VDI/VDE 3540)	2 (VDI/VDE 3540)	2 (VDI/VDE 3540)
Complete delivery scope: - Instrument with cover, power supply unit and stand - set additionally with electrode and buffer	■	■	■	■
IQ and OQ documents available	■	■	■	■
Warranty 3 years	■	■	■	■

Lab 970	ProLab 1000	ProLab 2000	ProLab 3000	ProLab 4000
p. 10/11	p. 12/13	p. 14/15	p. 16 – 19	p. 20/21
		■		
		0...20.00 mg/l / 0.01 mg/l 0...90.0 mg/l / 0.1		
		0...200.0 % / 0.1 % 0...600 % / 1 %		
		0...200.0 mbar / 0.1 mbar 0...1250 mbar / 1 mbar		
		0.5		
		■		
		■		
■	■	■	■	■
-5.0 ... +120.0 °C	-10.0 ... +120.0 °C	-10.0 ... +120.0 °C	-35.0 ... +150.0 °C	-35.0 ... +150.0 °C
± 0.1 °C	± 0.1 °C	± 0.1 °C	± 0.1 °C	± 0.1 °C
-	-	-	■	■
■	■	■	■	■
■	■	■	■	■
LCD 75 x 60 mm	black & white graphic 120 x 90 mm with lighting	black & white graphic 120 x 90 mm with lighting	QVGA colour graphic display 120 x 90 mm with lighting	QVGA colour graphic display 120 x 90 mm with lighting
-	■	■	-	-
-	■	■	■	■
■	-	-	-	-
-	1500 data sets, storage intervals from 1 s ... 60 min	1500 data sets, storage intervals from 1 s ... 60 min	> 10000 data sets, storage intervals from 1 s ... 60 min	> 10000 data sets, storage intervals from 1 s ... 60 min
■	■	■	■	■
			■	■
plastic	metal diecast	metal diecast	metal diecast	metal diecast
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■
■	-	-	-	-
■	-	-	-	-
240 x 190 x 80	240 x 280 x 70	240 x 280 x 70	240 x 280 x 70	240 x 280 x 70
approx. 1.0 kg	approx. 2.5 kg	approx. 2.5 kg	approx. 2.5 kg	approx. 2.5 kg
CE, cETLus	CE, cETLus	CE, cETLus	CE, cETLus	CE, cETLus
protection class III, EG guidelines 73/23, EN 61010-1: 2001	protection class III, EG guidelines 73/23, EN 61010-1: 2001	protection class III, EG guidelines 73/23, EN 61010-1: 2001	protection class III, EG guidelines 73/23, EN 61010-1: 2001	protection class III, EG guidelines 73/23, EN 61010-1: 2001
2 (VDI/VDE 3540)	2 (VDI/VDE 3540)	2 (VDI/VDE 3540)	2 (VDI/VDE 3540)	2 (VDI/VDE 3540)
■	■	■	■	■
■	■	■	■	■
■	■	■	■	■

Order information

Type no.	Order no.	Product	Description
Lab series			
Lab 850	285201300	Laboratory pH Meter	Measuring parameters pH, mV, temp., microprocessor, DIN 19262 connection. Including cover Z 880, stand S4D Z 865 and power supply Z 850.
Lab 850 Set	285201310	Laboratory pH Meter	Measuring parameters pH, mV, temp., microprocessor, DIN 19262 connection. Including cover Z 880, stand S4D Z 865, power supply Z 850, pH-temp. combination electrode BlueLine 14 pH, calibration solutions (DIN).
Lab 850 BNC	285201360	Laboratory pH Meter	Measuring parameters pH, mV, temp., microprocessor, BNC connection. Including cover Z 880, stand S4D Z 865 and power supply Z 850.
Lab 850 BNC Set	285201370	Laboratory pH Meter	Measuring parameters pH, mV, temp., microprocessor, BNC connection. Including cover Z 880, stand S4D Z 865, power supply Z 850, pH-temp. combination electrode BlueLine 15 pH, calibration solutions (DIN).
Lab 860	285201320	Laboratory pH Meter	Measuring parameters pH, mV, temp., microprocessor, RS 232 C and USB (slave) interface, data storage for 800 data sets, GLP conform, DIN 19262 connection. Including cover Z 880, stand S4D Z 865 and power supply Z 850.
Lab 860 Set	285201330	Laboratory pH Meter	Measuring parameters pH, mV, temp., microprocessor, RS 232 C and USB (slave) interface, storage for 800 data sets, GLP conform, DIN 19262 connection. Incl. cover Z 880, stand S4D Z 865, power supply Z 850, pH-temp. combination electrode BlueLine 14 pH, calibration solutions (DIN).
Lab 860 BNC	285201380	Laboratory pH Meter	Measuring parameters pH, mV, temp., microprocessor, RS 232 C and USB (slave) interface, data storage for 800 data sets, GLP conform, BNC connection. Including cover Z 880, stand S4D Z 865 and power supply Z 850.
Lab 860 BNC Set	285201390	Laboratory pH Meter	Measuring parameters pH, mV, temp., microprocessor, RS 232 C and USB (slave) interface, storage for 800 data sets, GLP conform, BNC connection. Including cover Z 880, stand S4D Z 865, power supply Z 850, pH-temp. combination electrode BlueLine 15 pH, calibration solutions (DIN).
Lab 870	285201340	Laboratory pH Meter	Electrode recognition. Measuring parameters pH, mV, temp., microprocessor, RS 232 C and USB (slave) interface, GLP conform, DIN 19262 connection. Including cover Z 880, stand S4D Z 865 and power supply Z 850.
Lab 870 Set	285201350	Laboratory pH Meter	Electrode recognition. Measuring parameters pH, mV, temp., microprocessor, RS 232 C and USB (slave) interface, GLP conform, DIN 19262 connection. Including cover Z 880, stand S4D Z 865, power supply Z 850, pH-temp. combination electrode BlueLine 14 pH ID, calibration solutions (DIN).
Lab 870 BNC	285201400	Laboratory pH Meter	Electrode recognition. Measuring parameters pH, mV, temp., microprocessor, RS 232 C and USB (slave) interface, GLP conform, BNC connection. Including cover Z 880, stand S4D Z 865 and power supply Z 850.
Lab 870 BNC Set	285201410	Laboratory pH Meter	Electrode recognition. Measuring parameters pH, mV, temp., microprocessor, RS 232 C and USB (slave) interface, GLP conform, BNC connection. Including cover Z 880, stand S4D Z 865, power supply Z 850, pH-temp. combination electrode BlueLine 15 pH ID, calibration solutions (DIN).
Lab 960	285201420	Laboratory Conductivity Meter	Measuring ranges 0.000 µS/cm...500 mS/cm, salinity, total dissolved solids (TDS), temp., RS 232 C and USB (slave) interface, microprocessor, data storage for 800 data sets, GLP conform. Including cover Z 880, stand S4D Z 865 and power supply Z 850.
Lab 960 Set	285201430	Laboratory Conductivity Meter	Measuring ranges 0.000 µS/cm...500 mS/cm, salinity, total dissolved solids (TDS), temp., RS 232 C and USB (slave) interface, microprocessor, data storage for 800 data sets, GLP conform. Including cover Z 880, stand S4D Z 865, power supply Z 850, conductivity cell LF 413 T and conductivity testing solution.
Lab 970	285201440	Laboratory Conductivity Meter	Sensor recognition. Measuring ranges 0.000 µS/cm...500 mS/cm, salinity, total dissolved solids (TDS), temp., RS 232 C and USB (slave) interface, microprocessor, GLP conform. Including cover Z 880, stand S4D Z 865 and power supply Z 850.
Lab 970 Set	285201450	Laboratory Conductivity Meter	Sensor recognition. Measuring ranges 0.000 µS/cm...500 mS/cm, salinity, total dissolved solids (TDS), temp., RS 232 C and USB (slave) interface, microprocessor, GLP conform. Including cover Z 880, stand S4D Z 865, power supply Z 850, conductivity cell LF 413 T ID and conductivity testing solution.
ProLab series			
ProLab 1000	285201700	Digital laboratory pH Meter	Electrode recognition and user identification. Measuring parameters pH, mV, temp., microprocessor, RS 232 C and USB (slave) interface, GLP conform, DIN 19262 connection. Including cover Z 881, stand S4D Z 865 and power supply Z 850.
ProLab 1000 Set	285201710	Digital laboratory pH Meter	Electrode recognition and user identification. Measuring parameters pH, mV, temp., microprocessor, RS 232 C and USB (slave) interface, GLP conform, DIN 19262 connection. Including cover Z 881, stand S4D Z 865, power supply Z 850, pH-temp. combination electrode A 161 1M-DIN-ID, calibration solutions (DIN).
ProLab 1000 BNC	285201720	Digital laboratory pH Meter	Electrode recognition and user identification. Measuring parameters pH, mV, temp., microprocessor, RS 232 C and USB (slave) interface, GLP conform, BNC connection. Including cover Z 881, stand S4D Z 865 and power supply Z 850.
ProLab 1000 BNC Set	285201730	Digital laboratory pH Meter	Electrode recognition and user identification. Measuring parameters pH, mV, temp., microprocessor, RS 232 C and USB (slave) interface, GLP conform, BNC connection. Including cover Z 881, stand S4D Z 865, power supply Z 850, pH-temp. combination electrode A 161 1M-BNC-ID, calibration solutions (DIN).
ProLab 2000	285201740	Digital laboratory multi Meter	Electrode recognition and user identification. Measuring parameters pH, mV, ISE, conductivity, D.O. and temp., microprocessor, RS 232 C and USB (slave) interface, GLP conform, DIN 19262 connection. Including cover Z 881, stand S4D Z 865 and power supply Z 850.
ProLab 2000 Set	285201750	Digital laboratory multi Meter	Electrode recognition and user identification. Measuring parameters pH, mV, ISE, conductivity, D.O. and temp., microprocessor, RS 232 C and USB (slave) interface, GLP conform, DIN 19262 connection. Including cover Z 881, stand S4D Z 865, power supply Z 850, pH-temp. combination electrode A 161 1M-DIN-ID, combined conductivity and D.O. sensor LFOX 1400 ID, calibration solutions (DIN), conductivity testing solutions.

Type no.	Order no.	Product	Description
ProLab 2000 BNC	285201760	Digital laboratory multi Meter	Electrode recognition and user identification. Measuring parameters pH, mV, ISE, conductivity, D.O. and temp., microprocessor, RS 232 C and USB (slave) interface, GLP conform, BNC connection. Including cover Z 881, stand S4D Z 865 and power supply Z 850.
ProLab 2000 BNC Set	285201770	Digital laboratory multi Meter	Electrode recognition and user identification. Measuring parameters pH, mV, ISE, conductivity, D.O. and temp., microprocessor, RS 232 C and USB (slave) interface, GLP conform, BNC connection. Including cover Z 881, stand S4D Z 865, power supply Z 850, pH-temp. combination electrode A 161 1M-BNC-ID, combined conductivity and D.O. sensor LFOX 1400 ID, calibration solutions (DIN), conductivity testing solutions.
ProLab 3000	285203600	Digital laboratory pH Meter	Electrode recognition and user identification. QVGA colour display. Menu based operation. Recorder function. Measuring parameters: double-pH, mV, Temp, ISE. RS232, USB host + USB slave interfaces. DIN connection. Incl. Z880, Z865 + Z850.
ProLab 3000 Set	285203610	Digital laboratory pH Meter	Electrode recognition and user identification. QVGA colour display. Menu based operation. Recorder function. Measuring parameters: conductivity + double-pH, mV, Temp, ISE. RS232, USB host + USB slave interfaces. DIN connection. Incl. Z880, Z865 + Z850. Z880, Z865, Z850, IL-pHT-A170MF-DIN-N, DIN buffers.
ProLab 3000 BNC	285203620	Digital laboratory pH Meter	Electrode recognition and user identification. QVGA colour display. Menu based operation. Recorder function. Measuring parameters: double-pH, mV, Temp, ISE. RS232, USB host + USB slave interfaces. BNC connection. Incl. Z880, Z865 + Z850..
ProLab 3000 BNC Set	285203630	Digital laboratory pH Meter	Electrode recognition and user identification. QVGA colour display. Menu based operation. Recorder function. Measuring parameters: double-pH, mV, Temp, ISE. RS232, USB host + USB slave interfaces. BNC connection. Incl. Z880, Z865, Z850, IL-pHT-A170MF-BNC-N, DIN buffers.
ProLab 4000	285203640	Digital laboratory multi Meter	Electrode recognition and user identification. QVGA colour display. Menu based operation. Recorder function. Measuring parameters: conductivity + double-pH, mV, Temp, ISE. RS232, USB host + USB slave interfaces. DIN connection. Incl. Z880, Z865 + Z850.
ProLab 4000 Set	285203650	Digital laboratory multi Meter	Electrode recognition and user identification. QVGA colour display. Menu based operation. Recorder function. Measuring parameters: conductivity + double-pH, mV, Temp, ISE. RS232, USB host + USB slave interfaces. DIN connection. Incl. Z880, Z865, Z850, IL-pHT-A170MF-DIN-N, LF413TID, DIN buffer, conductivity testing solution.
ProLab 4000 BNC	285203660	Digital laboratory multi Meter	Electrode recognition and user identification. QVGA colour display. Menu based operation. Recorder function. Measuring parameters: conductivity + double-pH, mV, Temp, ISE. RS232, USB host + USB slave interfaces. BNC connection. Incl. Z880, Z865 + Z850.
ProLab 4000 BNC Set	285203670	Digital laboratory multi Meter	Electrode recognition and user identification. QVGA colour display. Menu based operation. Recorder function. Measuring parameters: conductivity + double-pH, mV, Temp, ISE. RS232, USB host + USB slave interfaces. BNC connection. Incl. Z880, Z865, Z850, IL-pHT-A170MF-BNC-N, LF413TID, DIN buffer, conductivity testing solution.
Accessories			
Logbook Lab 850	285201800	Logbook	for Lab 850 (DIN and BNC) incl. review by SCHOTT Instruments after resending the filled in documents.
Logbook Lab 860	285201810	Logbook	for Lab 860 (DIN and BNC) incl. review by SCHOTT Instruments after resending the filled in documents.
Logbook Lab 870	285201820	Logbook	for Lab 870 (DIN and BNC) incl. review by SCHOTT Instruments after resending the filled in documents.
Logbook Lab 960	285201840	Logbook	for Lab 960 incl. review by SCHOTT Instruments after resending the filled in documents.
Logbook Lab 970	285201850	Logbook	for Lab 970 incl. review by SCHOTT Instruments after resending the filled in documents.
Logbook ProLab 1000	285201830	Logbook	for ProLab 1000 (DIN and BNC) incl. review by SCHOTT Instruments after resending the filled in documents.
Logbook ProLab 2000	285201860	Logbook	for ProLab 2000 (DIN and BNC) incl. review by SCHOTT Instruments after resending the filled in documents.
Logbook ProLab 3000	285203680	Logbook	for ProLab 3000 (DIN and BNC) incl. review by SCHOTT Instruments after resending the filled in documents.
Logbook ProLab 4000	285203690	Logbook	for ProLab 4000 (DIN and BNC) incl. review by SCHOTT Instruments after resending the filled in documents.
Z 390	285201560	Cable for connection to PC	RS 232 6pole cable for connection to PC for Lab 860, Lab 870, Lab 960 and Lab 970 as well as for all instruments being part the ProLab series
Z 396	285201580	Software	Software for documentation for Lab 860, Lab 870, Lab 960, Lab 970, handylab 12 as well as for all instruments being part of the ProLab series
Z 850	285204889	Power supply	Universal power supply unit, 230 and 120 V for the Lab- and ProLab-meter family
Z 865	285201520	Stand set S4D	Stand set S4D, including arm and electrode holder for the Lab- and ProLab-meter family
Z 875	285201540	USB cable	for Lab 860, Lab 870, Lab 960 and Lab 970 as well as for all instruments of the ProLab-meter series with USB (slave)
Z 876	285201890	Transponder	User recognition transponder for ProLab instruments
Z 880	285201550	Cover	for the Lab-meter family
Z 881	285201880	Cover	for the ProLab-meter family
Z 890	285203700	Universal paper printer	Star SP-712 (9-matrix printer). Easy paper load. Serial interface. Dimensions: 160 (width) x 245 (depth) x 152 (height) mm. Weight 2.96 kg. Integrated power supply..
Z 891	285203710	ink ribbon (black)	for printer Z 890. Product life cycle: 3 million characters.
Z 892	285203720	printer paper role	for printer Z 890, 1 piece. Universal paper. Width 76 mm. External diameter 80 mm, inner core 12 mm.
Z 893	285203730	Connecting cable	for connection of printer Z 890 to the ProLab meters (except Lab 850) and ProLab-meter family.
	285209081	Manufacturer certificate	for pH-Meter, conductivity meter and pH/mV simulators from SCHOTT Instruments