

VWR®

Electrochemistry

01. METERS

02. ELECTRODES & SENSORS

03. BUFFERS & STANDARDS

04. pH INDICATORS

05. TITRATION

06. KARL FISCHER



Electrochemistry and titration

In this guide you will find meters from basic to high level, electrodes and sensors, buffers and standards and all you need to do your measurement in a correct and safe way.

It doesn't matter if you're measuring pH in the field or the laboratory, working within the strict boundaries of NIST or Pharmacopeia traceability, or just doing a quick check on a buffer solution you've just made up - everything you need is here.

pHenomenal® MD 8000 models, with Digital Intelligent Probes, take you into the future where complete data, accuracy and efficiency are becoming more and more important.

You'll notice several things about the VWR range of products for electrochemistry:

- **Choice** - enough to cover almost every application packed into a series of models without being overwhelming.
- **Performance** - market leading consistency and reliability backed up with warranties that run to many years.
- **Value for money** - well built products that last and don't cost a fortune to buy.
- **Specifications** - our VWR Chemicals buffers and standards are certificated for each and every batch - we don't quote just typical analyses but real results.

Our VWR Chemicals buffers and standards are certified for each and every batch. The use of Certified Reference Materials will guarantee accurate and reliable results and avoid duplicate measurements that are often expensive and time-consuming.



Table of contents

ELECTROCHEMISTRY INSTRUMENTS

pH/mV and ORP/ISE meters
Pages 7-15

Conductivity meters
Pages 16-22

Dissolved oxygen meters
Pages 23- 29

Multi-parameter meters
Pages 29-35

ELECTRODES & SENSORS

Intelligent electrodes
Pages 36-40

pHEnomenal electrodes
Page 41

pH and general use electrodes
Pages 42-43

Stands and cables
Page 44

Cleaning and maintenance
Pages 46

BUFFERS & STANDARDS

Conductivity
Pages 46-47

pH
Pages 48-49

pH indicator papers
Pages 50-51

TITRATION

Bottle-top titrators
Page 52

Burettes
Page 53

Volumetric solutions
Pages 53-56

Secondary reference standards
for volumetric titration
Page 57

Indicators
Pages 57-58

KARL FISCHER WATER DETERMINATION

Volumetric reagents
Page 59

Coulometric reagents
Page 60

Karl Fischer standards
Page 60

ACCESSORIES

Glassware
Pages 61-63

Safety and more
Pages 64-67

Electrochemistry Instruments

For every parameter you have a choice of testers, handheld and bench meters. This selector will guide you through this brochure to find the meter you need.



VWR® ENTRY LEVEL, PHENOMENAL® ROUTINE & PROFESSIONAL LEVEL

OVERVIEW OF PH-, REDOX- & ION SELECTIVE METERS

	VWR®					VWR® pHenomenal®				
Model	pH10 Pen	ORP15 Pen	pH/CO1030	pH20	pH-130	pH 1100 H	MD 8000 H	pH 1100L	IS 2100L	MD 8000 L
Type of instrument	Pen tester	Pen tester	Pen tester	Tester	Handheld	Handheld	Handheld	Bench	Bench	Bench
Accuracy level	+	+	+	+	++	+++	++++	+++	+++	++++
pH range	0...+14	-	0...+14	0...+14	0...+14	-2...+20	-2...+20	-2...+20	-2...+20	-2...+20
mV range	-	±1100	-	-	±1999	±2500	±2500	±2500	±2500	±2500
ISE range (mg/L)	-	-	-	-	-	Manual	Manual	Manual	0,001 - 9999	Manual
Other parameters	No	No	Yes	No	No	No	Yes	No	No	Yes
Temperature range (°C)	0...+10	-10...+100	-5...+60	-	-5... +110	-5...+105	-5...+105	-5...+105	-5...+105	-5...+105
Memory data sets	50	50	50	-	200	5000	4500	5000	5000	4500
Data logging	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Temperature compensation*	ATC	-	ATC	MTC	ATC - MTC	ATC - MTC	ATC - MTC	ATC - MTC	ATC - MTC	ATC - MTC
Automatic buffer recognition	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
pH calibration points	1, 2 or 3	-	1, 2 or 3	Up to 2	1, 2 or 3	Up to 5	Up to 5	Up to 5	Up to 5	Up to 5
ISE calibration	-	-	-	-	-	-	-	-	2 - 7 points	-
Protection class	IP 67	IP 67	IP 67	IP 65 / IP 67	IP 66	IP 67	IP 67	IP 43	IP 43	IP 43
PC outputs	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Page	7	7	30	8	9	10	11	12	13	14

* ATC: Automatic temperature compensation

* MTC: Manual temperature compensation

CONDUCTIVITY METERS

	VWR®					VWR® pHenomenal®		
Model	pH/CO1030	CO 30	HCO 304	LCO 304	CO-330	CO 3100 H	MD 8000 H	CO 3100 L
Type of instrument	Pen tester	Tester	Tester	Tester	Handheld	Handheld	Handheld	Bench
Accuracy level	+	+	+	+	++	+++	++++	+++
Conductivity range (mS/cm)	0 - 20	0 - 19,90	0 - 100	0 - 0,1	0 - 1000	0 - 1000	0 - 1000	0 - 1000
Resistivity range (MΩ·cm)	-	-	-	0 - 20,00	-	0 - 999,9	0 - 100	1 - 999,9
Salinity range (ppt)	0 - 10	-	0 - 50	-	NaCl 0,296 g/L KCl 0,239 g/L	0 - 70	0 - 70	0 - 70
TDS range (g/L)	0 - 20	0 - 10	0 - 2	-	0 - 200	0 - 200	0 - 200	0 - 200
Temperature range (°C)	-5...+60	0...+100	-5...+100	-5...+100	-5 ... 70	-5...+105	-5...+105	-5...+105
Other parameters	Yes	No	No	No	No	No	Yes	No
Memory data sets	50	-	-	-	200	5000	4500	5000
Data logging	No	No	No	No	No	Yes	Yes	Yes
Temperature compensation	ATC	ATC	0 - nlf - lin	0 - nlf - lin	0 - lin	0 - nlf - lin	0 - nlf - lin	0 - nlf - lin
Conductivity calibration points	-	1 or 2	1	1	1	1	1	1
Protection class	IP 67	IP 67	IP 65 / IP 67	IP 65 / IP 67	IP 66	IP 67	IP 67	IP 43
PC output	No	Np	No	No	No	Yes	Yes	Yes
Page	30	15	17	16	17	19	20	21

DISSOLVED OXYGEN METERS

	VWR®		VWR® pHenomenal®			
Model	DO 40	DO-230	OX 4100 H	OX 4110 H	MD 8000 H	OX 4100 L
Type of instrument	Tester	Handheld	Handheld	Handheld	Handheld multi-parameter	Bench
Accuracy level	+	++	+++	+++	++++	+++
DO range (mg/ml)	0 - 20	0 - 30	0 - 90	0 - 50	0 - 50	0 - 90
DO saturation range (%)	0 - 200	0 - 300	0 - 600	0 - 500	0 - 500	0 - 600
Oxygen probe*	AMP	AMP	AMP	OPT	OPT	AMP
Temperature range (°C)	-5...+50	0 - 40	0...+100	0...+50	-5...+105	0...+50
Other parameters	No	No	No	No	Yes	No
Memory data sets	-	200	5000	5000	4500	5000
Data logging	No	No	Yes	Yes	Yes	Yes
Protection	IP 65 / IP 67	IP 66	IP 67	IP 67	IP 67	IP 43
DO salinity compensation (g/L)	-	0,0 - 40,0	0,0 - 35	0,0 - 35	0,0 - 35	0,0 - 35
PC outputs	No	No	Yes	Yes	Yes	Yes
Page	23	24	26	27	28	29

MULTI-PARAMETER METERS

Brand	VWR®	VWR® pHenomenal®			
Type of instrument	Pen tester	Handheld		Bench	
Model	pH/CO 1030	MU 6100 H	MD 8000 H	MU 6100 L	MD 8000 L
Accuracy level	+	+++	++++	+++	++++
pH range	0...+14	-2...+20	-2...+20	-2...+20	-2...+20
mV range	-	±2500	±2500	±2500	±2500
ISE range (mg/L)		Manual	Manual	Manual	Manual
Conductivity range (mS/cm)	0 - 20	0 - 1000	0 - 1000	0 - 1000	0 - 1000
Resistivity range (MΩ·cm)	No	1 - 999	43485	1 - 999	43485
Salinity range (ppt)	0 - 10	0 - 70	0 - 70	0 - 70	0 - 70
TDS range (g/L)	0 - 20	0 - 200	0 - 200	0 - 200	0 - 200
DO range (mg/ml)	-	0 - 90	0 - 50	0 - 90	0 - 50
DO saturation range (%)	-	0 - 600	0 - 500	0 - 600	0 - 500
Oxygen probe	-	AMP*	OPT*	AMP*	OPT*
DO salinity compensation (g/L)	No	Yes	Yes	Yes	Yes
Temperature range (°C)	-5...+60	-5...+105	-5...+105	-5...+105	-5...+105
Memory data sets	50	5000	4500	5000	4500
Data logging	No	Yes	Yes	Yes	Yes
Temperature compensation	ATC	ATC - MTC	ATC - MTC	ATC - MTC	ATC - MTC
Automatic buffer recognition	Yes	Yes	Yes	Yes	Yes
pH calibration points	1, 2 or 3	Up to 5	Up to 5	Up to 5	Up to 5
Conductivity calibration points	-	1	-	1	-
Compliance	IP 67	IP 67	IP 67	IP 43	IP 43
Outputs	No	Yes	Yes	Yes	Yes
Page	30	32	31	34	36

*AMP: Amperometric measuring head

*OPT: Optical measuring head



pH/°C & ORP/°C TESTERS, pH10 PEN & ORP15 PEN

Simple, compact instruments designed for quick accurate results in an economical pen format. Ideal for agriculture, education, fruit and vegetable washing, swimming pools, wastewater, pulp bleaching and aquaculture.

- Graphic LCD, IP 67 waterproof housing
- Replaceable electrodes
- Non volatile memory stores 50 sets of data (pH or absolute/relative ORP, temperature, date and time stamp)
- GLP functionality - saves and displays last calibration data
- Automatic temperature compensation; automatic calibration and buffer recognition

Warranty: 1 year (instrument)/6 months (electrode)

Supplied with 4x LR44 batteries.

Model	pH10 Pen	ORP15 Pen
pH range	0,00...+14,00	-
pH resolution	0,01	
pH accuracy	±0,1	
pH calibration	1-, 2- or 3-point	
mV range		±1100
mV resolution	-	1
mV accuracy		1 ±1 last significant digit
Temperature range (°C)	0,0...+100	-10...+100
Temperature resolution (°C)		0,1
Temperature accuracy (°C)		±0,3
Temperature ATC probe		Thermistor, 10 kΩ/25 °C
Data logging capacity		50 data sets
Display		LCD
Power supply		4x LR44 batteries
Weight (kg)		0,105 (with batteries)
Compliance		IP 67/GLP

Description	Pk	Cat. No.
pH10 Pen	1	662-0121
ORP15 Pen	1	662-0126

Description	Pk	Cat. No.
Accessories		
Replacement pH electrode (gel, non refillable), blue	1	662-0122
Replacement ORP electrode kit, incl. electrode, collar, 3xO-rings, sensor cap, blue	1	662-0127
Replacement pH electrode kit, pH10, light grey	1	664-0167
Replacement ORP electrode kit ORP15A, incl. electrode, collar, 3xO-rings, sensor cap, light grey	1	664-0166
Replacement sensor cap	1	662-0123
Replacement battery compartment	1	662-0124
Carry case, soft-sided, for VWR pH10 and ORP15 pen meters	1	662-1117
Button, alkaline manganese	1	139-2264



pH METER, HANDHELD, pH 20

This handheld measuring device features an ergonomic design, dust and waterproof housing in accordance with IP 65/67 and an illuminated display. This compact pH meter is a perfect alternative to pH testers.

- Modern and functional ABS housing
- Three-line display with backlight
- HOLD function, min./max. function, low battery indicator
- Durable, long battery life
- BNC connection for alternating electrodes

Typical applications include: Aquariums and aquaculture, plant cultivation and agriculture, laboratories, quality assurance, service and food.

Supplied with epoxy pH electrode, buffer capsules (2x pH 4 and 2x pH 7), 2x AA batteries and manual.

Model	pH 20
pH range	0,00 - 14,00
pH resolution	0,01
pH accuracy	±0,02 pH ±1 digit
pH calibration	Up to 2 points
Temperature compensation	-5...+150 °C (manual)
Display	3-line display with backlight
Connections	BNC
Power supply	2 AA batteries
WxDxH (mm)	54x28x108
Weight (kg)	0,13 (without electrode)
Compliance	IP 65 / IP 67

Description	Pk	Cat. No.
Handheld pH meter, pH 20	1	662-2283

Description	Material	Electrolyte	ØxL	Diaphr.	Connection	pH value	Colour	Reference temperature	Pack type	Pk	Cat. No.
Universal pH electrodes											
Single junction	Epoxy	Gel	12x120	Ceramic	1 m cable with BNC connector					1	662-1382
Double junction	Epoxy	Gel	12x120	Ceramic	1 m cable with BNC connector					1	662-1385
Accessories											
Potassium chloride 3 mol/L (3 N) in aqueous solution AVS TITRINORM									Plastic bottle	100 ml	83605.180
Electrode cleaning solutions											
Electrode cleaning solution pepsin/hydrochloric acid for removal of proteins									Plastic bottle	100 ml	83603.180
Assorted buffer kits											
						4,00/7,00/10,00	Colourless		Sachet	1 KIT	85046.001
pH electrode maintenance kit											
Buffers, electrolyte and cleaning solutions (100 ml)						4,00/7,00/10,00	Colourless	20 °C	Plastic bottle	1 SET	83609.600



PH-130 pH meter

pH/mV METER, PORTABLE, pH 130 SET

These economical, robust, and waterproof pH meters are supplied in complete, ready to use kits that incorporate a robust carrying case, electrode and temperature sensor with different cable lengths and buffers.

- Colour, graphic touch screen - enables simultaneous read-out of the pH or mV and temperature value
- Waterproof housing (IP 66) enables work in difficult conditions
- Small size and low weight make working in the field easier
- Calibration of the pH electrode: 1 to 3 points (pH: 4,00; 7,00; 10,00)
- Automatic buffer detection; calibration time reminder
- Automatic temperature compensation
- Read-out of the electrode's slope and offset; memory of 200 results

Used for pH, mV (redox potential) and temperature measurements. Powered by rechargeable batteries or power adapter. Long lasting work in laboratory possible with use of the power adapter.

24 month warranty.

Equipped with a standard pH electrode with built-in temperature sensor.

pH range	0,00 - 14,00
pH resolution	0,01 pH
pH accuracy	±0,01 pH
mV range	±2000 mV
mV resolution	1 mV
mV accuracy	±1 mV
Temperature range (°C)	0,0...50,0
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,1
Temperature compensation	-5...+110,0 °C
Power supply	2× AA 1,2 V rechargeable battery, 5 V/1000 mA power adapter
Weight (kg)	0,240
Dimensions	149×82×22 mm
Input	10 ¹² Ω

Description	Pk	Cat. No.
Portable pH, mV meter set, pH 130, with a touch screen	1	662-2351

Description	pH value	pH accuracy	pH buffer type	Colour	Reference temperature	Pack type	Pk	Cat. No.
Accessories								
Redox electrode glass REG-1, (ORP, mV)							1	662-2357
Electrode holder, EH-10							1	662-2352
pH electrode EPH-1T, plastic with a built-in temperature sensor, 1 m cable, BNC							1	662-2353
Stainless steel temperature sensor PT1000B TS-2B							1	442-1264
Potassium chloride 3 mol/L (3 N) in aqueous solution AVS TITRINORM						Plastic bottle	100 ml	83605.180
Buffer solutions in bottles								
	4,00	±0,02	Phthalate	Colourless	20 °C	Plastic bottle	100 ml	32095.184
	4,00	±0,02	Phthalate	Colourless	20 °C	Plastic bottle	500 ml	32095.264
	7,00	±0,02	Phosphate	Colourless	20 °C	Plastic bottle	100 ml	32096.187
	7,00	±0,02	Phosphate	Colourless	20 °C	Plastic bottle	500 ml	32096.267
	10,00	±0,02	Carbonate	Colourless	20 °C	Plastic bottle	100 ml	32040.185
	10,00	±0,02	Carbonate	Colourless	20 °C	Plastic bottle	500 ml	32040.260



662-1659

pH/mV/°C METER, HANDHELD, PHENOMENAL® pH 1100 H

This user friendly, portable instrument with robust IP 67 rated housing provides high resolution and accuracy for precise measurements in field applications. Complete with waterproof USB output for connection to a computer. GLP compliant.

- Large graphic LCD with continuous LED backlight shows both pH/mV and temperature value simultaneously
- Data logging function selectable between 1 min and 1 h
- 5000 data set memory capacity with automatic storing; additional 200-point memory for manual storage
- Automatic power shut-off: Adjustable from 10 min to 24 h
- Automatic buffer recognition of DIN and NIST buffers (1,68 / 4,00 / 6,86 / 9,18 / 12,54)
- Three additional technical buffers at 25 °C (4,00 / 7,00 / 10,00) in memory (pH 10,00 not included in delivery)
- Advanced self-test and diagnostics (electrode efficiency diagnostic, drift control); calibration symbol shows when recalibration is required
- Low energy consumption: 4× AA batteries for over 1000 operating hours

Ready to use portable pH kit pH 1100 H includes instrument in robust plastic carry case, gel epoxy pH electrode with built-in temperature sensor 111 (1 m cable), starter kit (two buffers (4,00 + 7,00), one plastic beaker), stand and instruction manual (22 languages) on CD ROM.

Model	pH 1100 H
pH range	–2,000...+20,000
pH resolution	0,1/0,01/0,001 (selectable)
pH accuracy	±0,005 pH ±1 digit
pH calibration	Up to 5 points
Automatic buffer recognition	VWR® Chemicals TITRINORM® buffers at 25 °C: 4,00/6,98/9,94 NIST/DIN 19266 (1,68/4,00/6,86/9,18/12,54) Technical buffers at 25 °C: 4,00/7,00/10,00
mV range	±1200,0/±2500
mV resolution	0,1/1
mV accuracy	±0,3/±1
Temperature range (°C)	Auto: –5,0...+105,0; Manual: –25...+130
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2
Temperature compensation	Auto/Manual
Data logging capacity	5000 data sets
Data logging - log function	Selectable between 1 min and 1 h (selectable intervals: 1 s, 5 s, 10 s, 30 s, 1 min, 5 min, 10 min, 15 min, 30 min, 60 min)
Display	Graphic LCD with LED backlight
Connections	BNC for pH/banana for temperature
Outputs	Waterproof USB connection (slave, bidirectional)
Power supply	4× AA batteries
Compliance	IP 67/GLP

Description	Pk	Cat. No.
Handheld pH/mV/°C meter pH 1100 H, pHenomenal®	1 SET	662-1659

Description	Material	Electrolyte	Ø×L (mm)	Diaphr.	Connection	pH value	pH accuracy	pH buffer type	Pk	Cat. No.
pH electrodes, pHenomenal®										
pHenomenal® 111 pH electrode, 3 in 1, with temperature sensor	Epoxy	Gel	12×120	Ceramic	BNC, 1 m cable				1	662-1157
Accessories										
pHenomenal® electrode storage tube									1	662-1167
pHenomenal® storage/measuring vessel									1	662-1248
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP									1	662-1225
pHenomenal® field carrying case									1	662-1168
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor									1	662-1169
Potassium chloride 3 mol/L (3 N) in aqueous solution AVS TITRINORM									100 ml	83605.180
Electrode cleaning solutions										
Electrode cleaning solution pepsin/hydrochloric acid for removal of proteins									100 ml	83603.180
Buffer solutions in bottles										
						4,00	±0,02	Phthalate	100 ml	32095.184
						7,00	±0,02	Phosphate	100 ml	32096.187
						10,00	±0,02	Carbonate	100 ml	32040.185



Handheld MD 8000 H pH kit

MULTI-PARAMETER METERS, HANDHELD, PHENOMENAL® MD 8000 H

These digital meters combine six parameters in one instrument: pH, mV, temperature, conductivity, dissolved oxygen and turbidity. IDP technology optimises use and makes measurement easier (no need to recalibrate when changing the meter, and no need to adjust the meter's settings). The measured data is complete with serial number, settings and calibration data.

- One universal measuring channel
- Digital sensor recognition: Measured parameter and settings are recognised automatically
- Suitable for Intelligent Digital Probes (IDP)
- Suitable for measurements with cable length up to 100 metres
- 4500-point memory
- Easy to read backlit B/W graphic display
- Low energy consumption (1000 operating hours)

Each kit is supplied in a carrying case with digital meter MD 8000 H, IDP pH/temperature electrode or conductivity/temperature cell or dissolved oxygen/temperature sensor, stand, buffers or standards, accessories, calibration certificate and instruction manual. Additional probes for other parameters can be added. Please contact your local Avantor sales office for further information on other electrodes available.

pH range	0 - 14
pH resolution	0,1/0,01/0,001
pH accuracy	±0,1, ±0,01, ±0,005
mV range	±2500; ±1200
mV resolution	0,1; 1
mV accuracy	±0,3; ±1
Conductivity range	0,01 µS/cm - 1000 mS/cm (depending on sensor)
Conductivity accuracy	±0,5% of value
Conductivity cell constant (cm ⁻¹)	Automatic
Resistivity range	1 Ωcm - 20 MΩcm (depending on sensor)
Salinity range	0 - 70
TDS range	0 mg/L - 199,9 g/L
DO concentration (mg/L)	0,00 - 20,00; 0,0 - 50,0
DO saturation (%)	0,0 - 200,0; 0 - 500
Temperature range (°C)	Auto: -5...+105
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2 K
Memory	4500 points
Data logging capacity	Up to 4500 data sets in automatic
Data logging - log function	Manual/time controlled
Display	Backlit B/W graphic LCD
Connections	1 measurement input
Calibration	Anycal 5-point customer buffer calibration
Calibration points	1 to 5 (automatic buffer recognition)
Interfaces	Mini USB-B (USB 1.1) for data downloads
IP rating	IP 67
Parameters	pH, mV, temperature, conductivity, dissolved oxygen, turbidity
Reference temperature	20/25 °C

Description	Pk	Cat. No.
Digital handheld phenomenal® MD 8000 H multi-parameter meter, pH kit, with intelligent gel plastic pH/temperature electrode IDP 711, 2 bottles of 50 ml pH buffers (1x pH 4,00 and 1x pH 7,00)	1 SET	665-0494
Digital handheld phenomenal® MD 8000 H multi-parameter meter, conductivity kit, with intelligent conductivity/temperature cell IDP 761-C with 1 bottle of 50 ml conductivity standard (1413 µS)	1 SET	665-0495
Digital handheld phenomenal® MD 8000 H multi-parameter meter, dissolved oxygen kit, with intelligent optical D.O./temperature sensor OPOX 11-3	1 SET	665-0496

Description	Temp. (°C)	Material	Electrolyte	ØxL (mm)	Diaphr.	Connection	Pk	Cat. No.
IDP pH electrodes, pHenomenal®								
pHenomenal® IDP 711 pH electrode	0...+80	Noryl	Gel	12x120	Fibre	1,5 m cable, IDP-plug	1	662-2296
pHenomenal® IDP 721 pH electrode	0...+100	Glass	KCl 3 mol/L, refillable	12x120	Ceramic	1,5 m cable, IDP-plug	1	662-2297
pHenomenal® IDP 721-LS pH electrode	-5...+100	Glass	KCl 3 mol/L, refillable	12x120	Platinum wire	1,5 m cable, IDP-plug	1	662-2298
IDP conductivity cell, pHenomenal® IDP 761-C								
pHenomenal® IDP 761-C intelligent conductivity cell, 4-cell graphite	0...+100	Epoxy		15,3x120		IDP plug, 1,5 m cable and universal connector	1	663-0356
IDP optical dissolved oxygen sensor, pHenomenal® OPOX 11-3								
pHenomenal® OPOX 11-3 optical oxygen probe with built-in temperature sensor	0...+50	Epoxy		15,3x140		1,5 m cable, IDP-plug	1	664-0182
Accessories								
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP							1	662-1225



pH/mV/°C METER, BENCH, PHENOMENAL® pH 1100L

This user friendly instrument, with articulated electrode stand and IP 43-rated housing, provides high resolution and accuracy for precise measurements. Complete with USB output for connection to a computer. GLP compliant.

- Large graphic LCD with continuous LED backlight showing both pH/mV and temperature value simultaneously
- Data logging function selectable between 1 min and 1 h; memory capacity of 5000 data sets
- Automatic power shut-off: Adjustable from 10 min to 24 h
- Automatic buffer recognition of DIN and NIST buffers (1,68 / 4,00 / 6,86 / 9,18 / 12,54)
- Three additional technical buffers at 25 °C (4,00 / 7,00 / 10,00) in memory
- Advanced self-test and diagnostics (electrode efficiency diagnostic, drift control); calibration symbol shows when recalibration is required
- Low energy consumption. Choice of mains supply or 4× AA batteries for over 1000 operating hours
- Low battery indicator

Ready to use pH 1100 L kit includes instrument, glass pH electrode with built-in 221 temperature sensor, 1 m cable and articulated stand, 2× buffers (4,00 / 7,00), plastic beaker and instruction manual (22 languages) on CD ROM.

The life science kit pH 1100LB includes the LS 221 Biotech electrode with 1 m cable instead of the 221 electrode.

Model	pH 1100L	pH 1100LB
pH range	–2,000...+20,000	
pH resolution	0,1 / 0,01 / 0,001 (selectable)	
pH accuracy	±0,1 / ±0,01 / ±0,005	
pH calibration	Up to 5 points	
Automatic buffer recognition	VWR® Chemicals TITRINORM® buffers at 25 °C: 4,00/6,98/9,94 NIST / DIN 19266 (1,68 / 4,00 / 6,86 / 9,18 / 12,54) Technical buffers at 25 °C: 4,00 / 7,00 / 10,00	
mV range	±1200,0 / ±2500	
mV resolution	0,1 / 1 (selectable)	
mV accuracy	±0,3 / ±1	
Temperature range (°C)	Auto: –5,0...+105,0; manual: –25...+130	
Temperature resolution (°C)	0,1 / 1	
Temperature accuracy (°C)	±0,2	
Temperature compensation	Auto / manual	
Data logging capacity	5000 data sets	
Data logging - log function	Selectable between 1 min and 1 h (selectable intervals: 1 s, 5 s, 10 s, 30 s, 1 min, 5 min, 10 min, 15 min, 30 min, 60 min)	
Display	Graphic LCD with LED backlight	
Connections	BNC for pH / banana for temperature	
Power supply	Mains or 4× AA batteries	
Compliance	IP 43 / GLP	
Outputs	USB connection (slave, bidirectional)	

Description	Pk	Cat. No.
Bench pH/mV/°C meter pH 1100L, pHenomenal®, with 221 general purpose electrode	1 SET	662-1657
Bench pH/mV/°C meter pH 1100LB, pHenomenal®, with LS 221 electrode for biotech applications	1 SET	662-1861

Description	Material	Electrolyte	ØxL (mm)	Diaphr.	Connection	pH value	pH accuracy	pH buffer type	Pk	Cat. No.
pH electrodes, pHenomenal®										
pHenomenal® 221 pH electrode, with temperature sensor	Glass	Refillable	12x120	Ceramic	BNC, 1 m cable				1	662-1161
pHenomenal® LS 221 (Tris) pH electrode, with temperature sensor	Glass	KCl 3 mol/L, refillable	12x120	Platinum	BNC, 1 m cable				1	662-1247
Accessories										
pHenomenal® electrode storage tube									1	662-1167
pHenomenal® storage/measuring vessel									1	662-1248
pHenomenal® compact survival kit (incl. electrode storage tube, 4 slots for storage of pH buffer, cleaning solution, etc and 1 slot for a dropper bottle)									1	662-1166
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP									1	662-1225
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor									1	662-1169
Potassium chloride 3 mol/L (3 N) in aqueous solution AVS TITRINORM									100 ml	83605.180
Electrode cleaning solutions										
Electrode cleaning solution pepsin/hydrochloric acid for removal of proteins									100 ml	83603.180
Buffer solutions in bottles										
						4,00	±0,02	Phthalate	100 ml	32095.184
						7,00	±0,02	Phosphate	100 ml	32096.187
						10,00	±0,02	Carbonate	100 ml	32040.185



pH/mV/°C/ION METER, BENCH, PHENOMENAL® IS 2100L

This user friendly instrument, with articulated electrode stand and IP 43-rated housing, provides high resolution and accuracy for precise multi-parameter measurements. Complete with USB output for connection to a computer. GLP compliant.

- Large graphic LCD with continuous LED backlight shows both pH/mV and temperature value simultaneously
- Data logging function selectable between 1 min and 1 h; memory capacity of 5000 data sets
- Automatic power shut-off: Adjustable from 10 min to 24 h
- Automatic buffer recognition of DIN and NIST buffers (1,68 / 4,00 / 6,86 / 9,18 / 12,54)
- Three additional technical buffers at 25 °C (4,00 / 7,00 / 10,00) in memory
- Advanced self-test and diagnostics (electrode efficiency diagnostic, drift control); calibration symbol shows when recalibration is required
- Low energy consumption. Choice of mains supply or 4× AA batteries for over 1000 operating hours
- Low battery indicator

Ready to use IS 2100L kit includes instrument, glass pH electrode with built-in temperature sensor 221, 1 m cable and articulated stand, 2× buffers, plastic beaker and instruction manual (22 languages) on CD ROM.

Model	IS 2100L
pH range	–2,000...+20,000
pH resolution	0,1/0,01/0,001 (selectable)
pH accuracy	±0,1/±0,01/±0,001
pH calibration	Up to 5 points
Automatic buffer recognition	VWR Chemicals TITRINORM® buffers at 25 °C: 4,00/6,98/9,94 NIST/DIN 19266 (1,68/4,00/6,86/9,18/12,54) Technical buffers at 25 °C: 4,00/7,00/10,00
mV range	±1200,0/±2500
mV resolution	0,1/1 (selectable)
mV accuracy	±0,3/±1
ISE range	0,001 - 9999 mg/L; 10 ⁻⁹ - 99,999 mol/L; 0,001 - 99999 ppm
ISE calibration	2 - 7 points
ISE units	mol/L, mg/L, ppm
Temperature range (°C)	Auto: –5,0...+105,0; manual: –25...+130
Temperature resolution (°C)	0,1/1
Temperature accuracy (°C)	±0,2
Temperature compensation	Auto/manual
Data logging capacity	5000 data sets
Data logging - log function	Selectable between 1 min and 1 h (selectable intervals: 1 s, 5 s, 10 s, 30 s, 1 min, 5 min, 10 min, 15 min, 30 min, 60 min)
Display	Graphic LCD with LED back light
Connections	BNC for pH/banana for temperature
Power supply	Mains or 4× AA batteries
Compliance	IP 43/GLP
Outputs	USB connection (slave, bidirectional)

Description	Pk	Cat. No.
Bench pH/mV/°C/ion meter pHenomenal® IS 2100L	1 SET	662-1658

Description	Material	Electrolyte	Ø×L (mm)	Diaphr.	Connection	Pk	Cat. No.
pH electrodes, pHenomenal®							
pHenomenal® 221 pH electrode, with temperature sensor	Glass	Refillable	12×120	Ceramic	BNC, 1 m cable	1	662-1161
pHenomenal® LS 221 (Tris) pH electrode, with temperature sensor	Glass	KCl 3 mol/L, refillable	12×120	Platinum	BNC, 1 m cable	1	662-1247
Accessories							
pHenomenal® electrode storage tube						1	662-1167
pHenomenal® storage/measuring vessel						1	662-1248
pHenomenal® compact survival kit (incl. electrode storage tube, 4 slots for storage of pH buffer, cleaning solution, etc and 1 slot for a dropper bottle)						1	662-1166
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP						1	662-1225
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor						1	662-1169
Potassium chloride 3 mol/L (3 N) in aqueous solution AVS TITRINORM						100 ml	83605.180
Electrode cleaning solutions							
Electrode cleaning solution pepsin/hydrochloric acid for removal of proteins						100 ml	83603.180
Buffer solutions in bottles							
						100 ml	32095.184
						100 ml	32096.187
						100 ml	32040.185



General purpose bench MD 8000 L pH kit with certificate

BENCH TOP DIGITAL MULTI-PARAMETER INSTRUMENTS, PHENOMENAL® MD 8000 L

These digital meters combine six parameters in one instrument: pH, mV, temperature, conductivity, dissolved oxygen and turbidity. IDP technology optimises use and makes measurement easier (no need to recalibrate when changing the meter, and no need to adjust the meter's settings). The measured data is complete with serial number, settings and calibration data.

- One universal measuring channel
- Digital sensor recognition: Measured parameter and settings are recognised automatically
- Suitable for Intelligent Digital Probes (IDP)
- Suitable for measurements with cable length up to 100 metres
- 4500-point memory
- Easy to read backlit B/W graphic display
- Low energy consumption (1000 operating hours)

Each kit is supplied with a bench top MD 8000 L or LB multi-parameter instrument, 1 intelligent refillable glass combined pH/temperature electrode, 2 bottles of 50 ml pH buffers (pH 4,00 and 7,00), 1 articulated stand, calibration certificate and instruction manual in 6 languages on CD. Please contact your local Avantor sales office for further information on other available electrodes.

pH range	0 - 14
pH resolution	0,1/0,01/0,001
pH accuracy	±0,1; ±0,01; ±0,005
mV range	±2500; ±1200
mV resolution	0,1; 1
mV accuracy	±0,3; ±1
Conductivity range	0,01 µS/cm - 1000 mS/cm (depending on sensor)
Conductivity accuracy	±0,5% of value
Conductivity cell constant (cm ⁻¹)	Automatic
Resistivity range	1 Ωcm - 20 MΩcm (depending on sensor)
Salinity range	0 - 70
TDS range	0 mg/L - 199,9 g/L
DO concentration (mg/L)	0,00 - 20,00; 0,0 - 50,0
DO saturation (%)	0,0 - 200,0; 0 - 500
Temperature range (°C)	Auto: -5...+105
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2 K
Data logging capacity	Up to 4500 data sets in automatic
Data logging - log function	Yes
Display	Backlit B/W graphic
Connections	1 measurement input
Power supply	230 V with power supply or 4x 1,5 V AA (supplied) or via USB port
Calibration	Any cal 5-point customer buffer calibration Max. 10 calibration storage 1 - 999 days calibration timer
Calibration points	1 - 5 (automatic buffer recognition)
Interfaces	Mini USB-B (USB 1.1) for data downloads
IP rating	IP 43
Parameters	pH, mV, temperature, conductivity, dissolved oxygen, turbidity
Reference temperature	20 / 25 °C

Description	Pk	Cat. No.
Digital bench top pHenomenal® MD 8000 L multi-parameter meter pH kit with 1 intelligent refillable glass, single junction combined pH/temperature electrode IDP 721	1 SET	665-0498
Digital bench top pHenomenal® MD 8000 LB multi-parameter meter pH kit for Life Science applications with 1 intelligent refillable glass, double platinum junction combined pH/temperature electrode IDP 721-LS	1 SET	665-0499

Description	Temp. (°C)	Material	Electrolyte	Ø×L (mm)	Diaphr.	Connection	Pk	Cat. No.
IDP pH electrodes, pHenomenal®								
pHenomenal® IDP 711 pH electrode	0...+80	Noryl	Gel	12×120	Fibre	1,5 m cable, IDP-plug	1	662-2296
pHenomenal® IDP 721 pH electrode	0...+100	Glass	KCl 3 mol/L, refillable	12×120	Ceramic	1,5 m cable, IDP-plug	1	662-2297
pHenomenal® IDP 721-LS pH electrode	-5...+100	Glass	KCl 3 mol/L, refillable	12×120	Platinum wire	1,5 m cable, IDP-plug	1	662-2298
IDP conductivity cell, pHenomenal® IDP 761-C								
pHenomenal® IDP 761-C intelligent conductivity cell, 4-cell graphite	0...+100	Epoxy		15,3×120		IDP plug, 1,5 m cable and universal connector	1	663-0356
IDP optical dissolved oxygen sensor, pHenomenal® OPOX 11-3								
pHenomenal® OPOX 11-3 optical oxygen probe with built-in temperature sensor	0...+50	Epoxy		15,3×140		1,5 m cable, IDP-plug	1	664-0182
Accessories								
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP							1	662-1225
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor							1	662-1169



CONDUCTIVITY/TDS/°C TESTER, WATERPROOF, EC30

- Conductivity, TDS and temperature measurement with simultaneous display of two parameters
- Calibration, one or two points
- Automatic temperature compensation, auto-ranging selection
- Replaceable conductivity cell
- IP 67 waterproof casing, low battery indicator

Supplied with 8× LR44 batteries.

Model	EC30
Conductivity range	0 – 1990 µS/cm (2 – 19,90 mS/cm with auto-ranging)
Conductivity resolution	5 µS/0,05 mS/0,10 mS
Conductivity accuracy	±1% full scale
Conductivity calibration	Manual, 1- or 2-point
TDS range	0,00 – 10,00 g/L
TDS resolution	0,10 g/L
TDS accuracy	±1% full scale
Temperature range (°C)	0,00...+99,5
Temperature resolution (°C)	0,5
Temperature accuracy (°C)	±0,5
Temperature compensation	Automatic
Temperature coefficient	1,91%/°C
Reference temperature	+25 °C
Compliance	IP 67

Description	Pk	Cat. No.
Waterproof conductivity/°C tester EC30	1	663-0160

Description	Pk	Cat. No.
Accessories		
Sensor replacement kit	1	663-0161
Replacement sensor cap	1	662-0123
Replacement battery compartment	1	662-0124



CONDUCTIVITY METER, HANDHELD, LCO 304

This high resolution device for measuring the conductivity up to 100 $\mu\text{S}/\text{cm}$ is supplied with a stainless steel measuring cell for measurements in pure and ultra-pure water.

- Measures conductivity and specific resistance
- Permanently connected 2-pole measuring cell (stainless steel) with integrated temperature sensor
- Dust- and waterproof (IP 65/IP 67) ABS housing
- 3-line display with battery status indicator and backlight, protected by an unbreakable pane, overhead display at the push of a button
- HOLD function, min./max. values, automatic measuring range shifting and automatic temperature compensation

Typical applications include: Laboratories, quality assurance and service.

Supplied with stainless steel measuring cell ($\varnothing$ 12 mm, 1,2 m cable), calibration log, two batteries and manual.

Waterproof VWR conductivity meter, LCO 304

Model	LCO 304
Conductivity range	0,000 - 2,000 $\mu\text{S}/\text{cm}$ 0,00 - 20,00 $\mu\text{S}/\text{cm}$ 0,0 - 100,0 $\mu\text{S}/\text{cm}$
Conductivity accuracy	($\pm 1\%$ of mV) $\pm 0,5\%$ FS
Resistivity range	0,0100 - 0,2000 $\text{M}\Omega\cdot\text{cm}$ 0,010 - 2,000 $\text{M}\Omega\cdot\text{cm}$ 0,01 - 20,00 $\text{M}\Omega\cdot\text{cm}$
Temperature range (°C)	-5,0...+100,0
Temperature accuracy (°C)	$\pm 0,3$
Temperature compensation	Off: Deactivated nLF: Non linear, according to EN 27888 LIN: Linear with variable coefficients NaCl: For weak NaCl solutions in accordance with EN 60746-3
Display	3-line display with backlight
WxDxH (mm)	54x28x108
Weight (kg)	0,23
Compliance	IP 65/IP 67
Sensor type	2-pole stainless steel measuring cell

Description	Pk	Cat. No.
Handheld conductivity meter, LCO 304	1	663-0349



CONDUCTIVITY METER, HANDHELD, HCO 304

This precise device for measuring conductivity up to 100 mS/cm is supplied with a durable wide range graphite measuring cell for universal use from DI water to salt water.

- Measures conductivity, salinity and TDS
- Permanently connected 2-pole measuring cell (graphite) with integrated temperature sensor
- Dust- and waterproof (IP 65/IP 67) ABS housing
- 3-line display with battery status indicator and backlight, protected by an unbreakable pane, overhead display at the push of a button
- HOLD function, min./max. values, automatic measuring range shifting, automatic temperature compensation

Typical applications include: Freshwater and salt water aquariums, reverse osmosis and similar filters, cleaning processes, cooling/lubricating processes, plant cultivation also agriculture, laboratories and quality assurance.

Supplied with graphite measuring cell (Ø 12 mm, 1,2 m cable), calibration log, two batteries and manual.

Waterproof conductivity meter HCO 304

Model	HCO 304
Conductivity range	0 - 2000 µS/cm 0,00 - 20,00 mS/cm 0,0 - 100,0 mS/cm
Conductivity accuracy	(±0,5% of mV) ±0,5% FS
Salinity range	0,0 - 50,0 g/kg water
TDS range	0 - 2000 mg/L
Temperature range (°C)	-5,0...+100,0
Temperature accuracy (°C)	±0,3
Temperature compensation	Off: Deactivated nLF: Non linear, according to EN 27888
Display	3-line display with backlight
WxDxH (mm)	54x28x108
Weight (kg)	0,2
Compliance	IP 65/IP 67
Sensor type	2-pole graphite measuring cell

Description	Pk	Cat. No.
Handheld conductivity meter, HCO 304	1	663-0348



Conductivity, TDS meter set with a touch screen CO-330

PORTABLE CONDUCTIVITY/SALINITY TDS METER, CO-330

These portable, economical meters can simultaneously measure conductivity, specific conductance, salinity, TDS (Total Dissolved Solids) and temperature.

- Colour, graphic touch screen enables simultaneous read out
- Six sub ranges switched automatically (auto range)
- Measures salinity with conversion to NaCl and KCl
- TDS measurement, constant coefficient 0,5; automatic temperature compensation
- Constant a coefficient (the temperature compensation coefficient) $-2\%/^{\circ}\text{C}$
- The reference temperature may be chosen between 25 or 20 $^{\circ}\text{C}$
- Memory of 200 results with time and date; calibration time reminding; powered by rechargeable batteries or power adapter

It converts conductivity into salinity according to real characteristics and not a constant coefficient. Measures conductivity in liquids with conductivity up to 1000 mS/cm. 1-point calibration by entering the constant K of the cell or by determining it with use of a standard solution.

Waterproof housing (IP 66) enables work in difficult conditions. Small size and low weight make working in the field easier.

Conductivity K constant = 0,010 to 20,000 cm^{-1}

24 month warranty.

Conductivity range	0 - 1000,0 S/cm, auto range - 6 subranges
Conductivity accuracy	$\pm 0,25\%$ up to 19,99 mS/cm $\pm 0,5\%$ above 20 mS/cm; (± 1 digit)
Salinity range	NaCl 0 - 296 g/L KCl 0 - 239 g/L
Salinity accuracy	$\pm 2,00\%$ (± 1 digit)
Temperature range ($^{\circ}\text{C}$)	$-50...+70$
Temperature accuracy ($^{\circ}\text{C}$)	$\pm 0,2$ (± 1 digit)
Temperature compensation	$-5...+70$ $^{\circ}\text{C}$
Temperature coefficient	Constant $2\%/^{\circ}\text{C}$
WxDxH (mm)	149x82x22
Weight (kg)	0,245

Description	Pk	Cat. No.
Conductivity, TDS meter set with a touch screen CO-330	1	663-0359

Description	Pack type	Pk	Cat. No.
Accessories			
Conductivity cell ECS-1T with a built-in temperature sensor, K=0,45/cm		1	663-0360
Electrode holder, EH-10		1	662-2352
Stainless steel temperature sensor PT1000B TS-2B		1	442-1264
Standard values (25 $^{\circ}\text{C}$)			
Conductivity standard 1413 $\mu\text{S}/\text{cm}$ (25 $^{\circ}\text{C}$)	Plastic bottle	100 ml	84135.180
Conductivity standard 12880 $\mu\text{S}/\text{cm}$ (25 $^{\circ}\text{C}$)	Plastic bottle	100 ml	84136.180



663-0234

CONDUCTIVITY/TDS/°C METER, HANDHELD, PHENOMENAL® CO 3100 H

This user friendly portable instrument with robust IP 67 rated housing provides high resolution and accuracy for precise measurements in field applications. Complete with waterproof USB output for connection to a computer. GLP compliant.

- Large graphic LCD with continuous LED backlight showing conductivity, TDS and temperature values simultaneously
- Data logging function selectable between 1 min and 1 h
- 5000 data set memory capacity with automatic storing; additional 200 data set memory for manual storage
- Automatic power shut-off: Adjustable from 10 min to 24 h
- Advanced self-test and diagnostics (electrode efficiency diagnostic, drift control); calibration symbol shows when re-calibration is required
- Low energy consumption: 4x AA batteries for over 1000 operating hours

Ready to use portable kit CO 3100 H includes instrument in robust plastic carrying case, conductivity probe with built-in temperature sensor CO 11 (1,5 m cable), starter kit (conductivity standard and plastic beaker), stand and instruction manual (22 languages) on CD ROM.

Conductivity probes for low conductivities are available on request. Please contact your Avantor local sales office for further information.

Model	CO 3100 H
Conductivity range	0,001 μ S/cm - 1000 mS/cm
Conductivity resolution	Min. 0,001 μ S/cm (depending on probe)
Conductivity accuracy	$\pm$ 0,5% of measured value
Conductivity cell constant	Depending on probe
Conductivity calibration	1 point
Resistivity range	1,000 Ω /cm - 999,9 M Ω /cm
Resistivity resolution	0,001 Ω /cm - 0,1 M Ω /cm
Resistivity accuracy	$\pm$ 0,5% of measured value
Salinity range	0,00 - 70 ppt
TDS range	0 - 1999 mg/L / 2,00 - 19,99 g/L / 20,0 - 199,9 g/L
TDS resolution	1 mg/L / 0,01 g/L / 0,1 g/L
TDS accuracy	$\pm$ 1% of measured value $\pm$ 1 digit
Temperature range (°C)	-5...+105,0
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	$\pm$ 0,2
Temperature compensation	Automatic and manual: 0,000 - 10,000%/K or without compensation
Display	Graphic LCD with LED backlight
Data logging capacity	5000 data sets
Data logging - log function	Selectable between 1 min and 1 h
Connections	8-pin connection for conductivity and temperature
Outputs	Watertight USB connection (slave, bidirectional)
Compliance	IP 67/GLP

Description	Pk	Cat. No.
Digital handheld CO 3100 H conductivity/TDS/°C meter, pHenomenal®	1 SET	663-0234

Description	Conductivity	Cell constant	Connection	Pack type	Reference temperature	Pk	Cat. No.
Conductivity cell, pHenomenal®							
pHenomenal® CO11, 2-pole graphite, integrated NTC 30	10 μ S/cm - 20	0,84 cm ⁻¹	8 pin, 1,5 m cable			1	663-0147
Accessories							
pHenomenal® electrode storage tube						1	662-1167
pHenomenal® storage/measuring vessel						1	662-1248
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP						1	662-1225
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor						1	662-1169
Conductivity standards at 25 °C, potassium chloride solutions							
KCl 0,01 mol/L	1,41			Plastic bottle	25 °C	100 ml	83607.180
KCl 0,1 mol/L	12,88			Plastic bottle	25 °C	500 ml	83608.260

MULTI-PARAMETER METERS, HANDHELD, PHENOMENAL® MD 8000 H

These digital meters combine six parameters in one instrument: pH, mV, temperature, conductivity, dissolved oxygen and turbidity. IDP technology optimises use and makes measurement easier (no need to recalibrate when changing the meter and no need to adjust the meter's settings). The measured data is complete with serial number, settings and calibration data.

- One universal measuring channel
- Digital sensor recognition: The measured parameter and settings are recognised automatically
- Suitable for Intelligent Digital Probes (IDP)
- Suitable for measurements with cable length up to 100 metres
- 4500 points memory
- Easy to read backlit B/W graphic display
- Low energy consumption (1000 operating hours)

Each kit is supplied in a carry case with digital meter MD 8000 H, IDP pH/temperature electrode or conductivity/temperature cell or dissolved oxygen/temperature sensor, stand, buffers or standards, accessories, calibration certificate and instruction manual. Additional probes for other parameters can be added. Please contact your local Avantor sales office for further information on other electrodes available.



Handheld MD 8000 H pH kit

pH range	0 - 14
pH resolution	0,1/0,01/0,001
pH accuracy	±0,1, ±0,01, ±0,005
mV range	±2500; ±1200
mV resolution	0,1; 1
mV accuracy	±0,3; ±1
Conductivity range	0,01 µS/cm - 1000 mS/cm (depending on sensor)
Conductivity accuracy	±0,5% of value
Conductivity cell constant (cm ⁻¹)	Automatic
Resistivity range	1 Ωcm - 20 MΩcm (depending on sensor)
Salinity range	0 - 70
TDS range	0 mg/L - 199,9 g/L
DO concentration (mg/L)	0,00 - 20,00; 0,0 - 50,0
DO saturation (%)	0,0 - 200,0; 0 - 500
Temperature range (°C)	Auto: -5...+105
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2 K
Memory	4500 points
Data logging capacity	Up to 4500 data sets in automatic
Data logging - log function	Manual/time controlled
Display	Backlit B/W graphic LCD
Connections	1 measurement input
Calibration	Anycal 5-point customer buffer calibration
Calibration points	1 to 5 (automatic buffer recognition)
Interfaces	Mini USB-B (USB 1.1) for data downloads
IP rating	IP 67
Parameters	pH, mV, temperature, conductivity, dissolved oxygen, turbidity
Reference temperature	20/25 °C

Description	Pk	Cat. No.
Digital handheld phenomenal® MD 8000 H multi-parameter meter, pH kit, with intelligent gel plastic pH/temperature electrode IDP 711, 2 bottles of 50 ml pH buffers (1x pH 4,00 and 1x pH 7,00)	1 SET	665-0494
Digital handheld phenomenal® MD 8000 H multi-parameter meter, conductivity kit, with intelligent conductivity/temperature cell IDP 761-C with 1 bottle of 50 ml conductivity standard (1413 µS)	1 SET	665-0495
Digital handheld phenomenal® MD 8000 H multi-parameter meter, dissolved oxygen kit, with intelligent optical D.O./temperature sensor OPOX 11-3	1 SET	665-0496

Description	Temp. (°C)	Material	Electrolyte	ØxL (mm)	Diaphr.	Connection	Pk	Cat. No.
IDP pH electrodes, pHenomenal®								
pHenomenal® IDP 711 pH electrode	0...+80	Noryl	Gel	12x120	Fibre	1,5 m cable, IDP-plug	1	662-2296
pHenomenal® IDP 721 pH electrode	0...+100	Glass	KCl 3 mol/L, refillable	12x120	Ceramic	1,5 m cable, IDP-plug	1	662-2297
pHenomenal® IDP 721-LS pH electrode	-5...+100	Glass	KCl 3 mol/L, refillable	12x120	Platinum wire	1,5 m cable, IDP-plug	1	662-2298
IDP conductivity cell, pHenomenal® IDP 761-C								
pHenomenal® IDP 761-C intelligent conductivity cell, 4-cell graphite	0...+100	Epoxy		15,3x120		IDP plug, 1,5 m cable and universal connector	1	663-0356
IDP optical dissolved oxygen sensor, pHenomenal® OPOX 11-3								
pHenomenal® OPOX 11-3 optical oxygen probe with built-in temperature sensor	0...+50	Epoxy		15,3x140		1,5 m cable, IDP-plug	1	664-0182
Accessories								
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP							1	662-1225



CONDUCTIVITY/TDS/°C METER, BENCH, PHENOMENAL® CO 3100L

This user friendly instrument, with articulated electrode stand and IP 43-rated housing, provides high resolution and accuracy for precise measurements. Complete with USB output for connection to a computer. GLP compliant.

- Large graphic LCD with continuous LED backlight showing both conductivity/TDS and temperature values simultaneously
- Data logging function selectable between 1 min and 1 h; memory capacity of 5000 data sets
- Automatic power shut-off: Adjustable from 10 min to 24 h
- Advanced self-test and diagnostics (electrode efficiency diagnostic, drift control); calibration symbol shows when re-calibration is required
- Low energy consumption. Choice of mains supply or 4× AA batteries for over 1000 operating hours

Ready to use conductivity CO 3100L kit includes instrument, conductivity probe CO 11 with built-in temperature sensor, 1,5 m cable and articulated stand, conductivity standard and plastic beaker and instruction manual (22 languages) on CD ROM.

Conductivity probes for low conductivities are available on request. Please contact your local Avantor sales office for further information.

Model	CO 3100L
Conductivity range	0,001 µS/cm - 1000 mS/cm
Conductivity resolution	Up to 0,001 µS/cm (depending on probe)
Conductivity accuracy	±0,5% of measured value
Conductivity cell constant	0,001 - 25 (depending on probe)
Conductivity calibration	1 point
Resistivity range	1,000 Ω/cm - 999,9 MΩ/cm
Resistivity resolution	0,001 Ω/cm - 0,1 MΩ/cm
Resistivity accuracy	±0,5% of measured value
Salinity range	0,00 - 70 ppt
TDS range	0 - 1999 mg/L / 2,00 - 19,99 g/L / 20,0 - 199,9 g/L
TDS resolution	1 mg/L / 0,01 g/L / 0,1 g/L
TDS accuracy	±0,5% of measured value
Temperature range (°C)	-5...+105,0
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2
Temperature compensation	Automatic and manual: 0,000 - 10,000%/K (linear or non linear); or no compensation
Display	Graphic LCD with LED backlight
Data logging capacity	5000 data sets
Data logging - log function	Selectable between 1 min and 1 h
Connections	8-pin connection for conductivity and temperature
Outputs	Watertight (IP 43) USB connection (slave, bidirectional)
Compliance	IP 43 / GLP

Description	Pk	Cat. No.
Bench conductivity/TDS/°C meter CO 3100L, pHenomenal®	1 SET	663-0233

Description	Conductivity	Cell constant	Connection	Pack type	Reference temperature	Pk	Cat. No.
Conductivity cell, pHenomenal®							
pHenomenal® CO11, 2-pole graphite, integrated NTC 30	10 µS/cm - 20	0,84 cm ⁻¹	8 pin, 1,5 m cable			1	663-0147
Accessories							
pHenomenal® electrode storage tube						1	662-1167
pHenomenal® storage/measuring vessel						1	662-1248
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP						1	662-1225
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor						1	662-1169
Conductivity standards at 25 °C, potassium chloride solutions							
KCl 0,01 mol/L	1,41			Plastic bottle	25 °C	100 ml	83607.180
KCl 0,1 mol/L	12,88			Plastic bottle	25 °C	500 ml	83608.260



General purpose bench MD 8000 L pH kit with certificate

BENCH TOP DIGITAL MULTI-PARAMETER INSTRUMENTS, PHENOMENAL® MD 8000 L

These digital meters combine six parameters in one instrument: pH, mV, temperature, conductivity, dissolved oxygen and turbidity. IDP technology optimises use and makes measurement easier (no need to recalibrate when changing the meter, and no need to adjust the meter's settings). The measured data is complete with serial number, settings and calibration data.

- One universal measuring channel
- Digital sensor recognition: Measured parameter and settings are recognised automatically
- Suitable for Intelligent Digital Probes (IDP)
- Suitable for measurements with cable length up to 100 metres
- 4500-point memory
- Easy to read backlit B/W graphic display
- Low energy consumption (1000 operating hours)

Each kit is supplied with a bench top MD 8000 L or LB multi-parameter instrument, 1 intelligent refillable glass combined pH/temperature electrode, 2 bottles of 50 ml pH buffers (pH 4,00 and 7,00), 1 articulated stand, calibration certificate and instruction manual in 6 languages on CD. Please contact your local Avantor sales office for further information on other available electrodes.

pH range	0 - 14
pH resolution	0,1/0,01/0,001
pH accuracy	±0,1; ±0,01; ±0,005
mV range	±2500; ±1200
mV resolution	0,1; 1
mV accuracy	±0,3; ±1
Conductivity range	0,01 µS/cm - 1000 mS/cm (depending on sensor)
Conductivity accuracy	±0,5% of value
Conductivity cell constant (cm ⁻¹)	Automatic
Resistivity range	1 Ωcm - 20 MΩcm (depending on sensor)
Salinity range	0 - 70
TDS range	0 mg/L - 199,9 g/L
DO concentration (mg/L)	0,00 - 20,00; 0,0 - 50,0
DO saturation (%)	0,0 - 200,0; 0 - 500
Temperature range (°C)	Auto: -5...+105
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2 K
Data logging capacity	Up to 4500 data sets in automatic
Data logging - log function	Yes
Display	Backlit B/W graphic
Connections	1 measurement input
Power supply	230 V with power supply or 4x 1,5 V AA (supplied) or via USB port
Calibration	Anycal 5-point customer buffer calibration Max. 10 calibration storage 1 to 999 days calibration timer
Calibration points	1 - 5 (automatic buffer recognition)
Interfaces	Mini USB-B (USB 1.1) for data downloads
IP rating	IP 43
Parameters	pH, mV, temperature, conductivity, dissolved oxygen, turbidity
Reference temperature	20 / 25 °C

Description	Pk	Cat. No.
Digital bench top pHenomenal® MD 8000 L multi-parameter meter pH kit with 1 intelligent refillable glass, single junction combined pH/temperature electrode IDP 721	1 SET	665-0498
Digital bench top pHenomenal® MD 8000 LB multi-parameter meter pH kit for Life Science applications with 1 intelligent refillable glass, double platinum junction combined pH/temperature electrode IDP 721-LS	1 SET	665-0499

Description	Temp. (°C)	Material	Electrolyte	Ø×L (mm)	Diaphr.	Connection	Pk	Cat. No.
IDP pH electrodes, pHenomenal®								
pHenomenal® IDP 711 pH electrode	0...+80	Noryl	Gel	12×120	Fibre	1,5 m cable, IDP-plug	1	662-2296
pHenomenal® IDP 721 pH electrode	0...+100	Glass	KCl 3 mol/L, refillable	12×120	Ceramic	1,5 m cable, IDP-plug	1	662-2297
pHenomenal® IDP 721-LS pH electrode	-5...+100	Glass	KCl 3 mol/L, refillable	12×120	Platinum wire	1,5 m cable, IDP-plug	1	662-2298
IDP conductivity cell, pHenomenal® IDP 761-C								
pHenomenal® IDP 761-C intelligent conductivity cell, 4-cell graphite	0...+100	Epoxy		15,3×120		IDP plug, 1,5 m cable and universal connector	1	663-0356
IDP optical dissolved oxygen sensor, pHenomenal® OPOX 11-3								
pHenomenal® OPOX 11-3 optical oxygen probe with built-in temperature sensor	0...+50	Epoxy		15,3×140		1,5 m cable, IDP-plug	1	664-0182
Accessories								
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP							1	662-1225
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor							1	662-1169



DISSOLVED OXYGEN METER, HANDHELD, DO 40

This portable oxygen meter, with maintenance friendly galvanic sensor, is an entry level device suitable for everyday use. Concentrations in mg/L (ppm) and saturation in percentage can be read directly without using tables.

- Ergonomic, dust- and waterproof ABS housing (IP 65/67)
- 3-line display with battery status indicator and backlight, protected by an unbreakable pane, overhead display at the push of a button
- Easy calibration at the push of a button
- HOLD function, min./max. values, stability recognition, automatic adjustment for environmental air
- Long battery life (>3000 h)

Ideal for use in fresh water and salt water aquariums, aquaculture/fish breeding, and for the monitoring of wells and bodies of water. The use of a protective cap is recommended for use in bodies of water in order to protect the membrane.

Supplied with galvanic sensor (with 2 m cable and integrated temperature sensor), spare membrane cap, 100 spare electrolytes, 2 batteries and manual.

Waterproof recalibratable VWR dissolved oxygen tester DO 40

Model	DO 40
DO concentration (mg/L)	0,0 - 20,0
DO accuracy	Concentration: ($\pm 1,5\%$ of mV) $\pm 0,2$ mg/L Saturation: ($\pm 1,5\%$ of mV) $\pm 2\%$
DO saturation (%)	0 - 200
Temperature range (°C)	0,0...+40,0
Temperature accuracy (°C)	$\pm 0,3$
Temperature compensation	Automatic with integrated temperature measurement
Display	3-line display with backlight
Power supply	2× AA battery
W×D×H (mm)	54×28×108 (without sensor)
Weight (kg)	0,24 (incl. sensor)
Compliance	IP 65/ 67

Description	Pk	Cat. No.
Handheld DO meter, DO 40	1	664-0234

Description	Pk	Cat. No.
Accessories		
Maintenance kit for DO 40, incl. 3 spare membranes and 100 ml electrolyte	1	664-0235

Designed for protection

VWR® Lab Safety

- Eyewear
- Footwear
- First aid kits
- Gloves
- Hand cleaning
- Labcoats and apparel
- Respirators
- Spill kits

Discover this
VWR Handy
Solution Guide
on **vwr.com**

PB18003-EN



DISSOLVED OXYGEN METER SET, PORTABLE, DO-230

These precise instruments measure dissolved oxygen in % and ppm (mg/L) and temperature. A built-in microprocessor stores, calculates and compensates for all parameters related to DO determinations.

- Colour, graphic touch screen - enables simultaneous read-out of the oxygen and temperature value
- Low weight and small size make working in the field easier
- Easy to use, accurate galvanic oxygen sensor with 1 m cable
- When properly maintained, the sensor may work efficiently for several years
- 1- or 2-point oxygen sensor calibration (at 0% and 100% or in the air 0% and 20,9%)
- Automatic temperature compensation; calibration time reminder
- Memory of 200 results with time and date; automatic switch-off function

Enables entering manually the values of air pressure and salinity for automatic correction of their influence on the result of oxygen concentration in water or sewage measured in mg/L. Used for field and laboratory work. Waterproof housing (IP 66) enables work in difficult conditions.

24 month warranty.

The standard set includes galvanic oxygen sensor with a built in PT1000B resistor for temperature measurement.

DO accuracy	±0,02 mg/L; ±0,2% (±1 digit)
Temperature range (°C)	-5,0...+40,0
Temperature accuracy (°C)	±0,1 (±1 digit)
Temperature compensation	0...40 °C
Power supply	2×AA 1,2 V rechargeable battery, 5 V/1000 mA power adapter
W×D×H (mm)	149×82×22
Weight (kg)	0,240
DO range	0 - 30,00 mg/L; 0 - 300,0%; 0 - 100,0% in air

Description	Pk	Cat. No.
Portable oxygen meter set DO-230 with a touch screen	1	664-0236

Description	Pk	Cat. No.
Accessories		
DO sensor DO OSG-1T, with a built-in temperature sensor	1	664-0237
Electrode holder, EH-10	1	662-2352
Maintenance set for the DO sensor MS-OSG-1, set includes: 3× spare membrane, 2×30 ml bottle of electrolyte, sandpaper	1	664-0238
Stainless steel temperature sensor PT1000B TS-2B	1	442-1264



664-0176

DISSOLVED OXYGEN METER, HANDHELD, PHENOMENAL® OX 4100 H

This user friendly portable instrument with robust IP 67 rated housing provides high resolution and accuracy for precise measurements in field applications. Complete with waterproof USB output for connection to a computer. GLP compliant.

- Large graphic LCD with continuous LED backlight showing both oxygen and temperature values simultaneously
- Data logging function selectable between 1 min and 1 h
- 5000 data set memory capacity with automatic storing; additional 200 data set memory for manual storage
- Automatic power shut-off: Adjustable from 10 min to 24 h
- Advanced self-test and diagnostics (electrode efficiency diagnostic, drift control); calibration symbol shows when re-calibration is required
- Low energy consumption: 4× AA batteries for over 1000 operating hours

Ready to use portable oxygen kit OX 4100 H includes instrument in robust plastic carrying case, galvanic oxygen probe OXY11-3 with built-in temperature sensor, 3 m cable and stand, maintenance kit and instruction manual (22 languages) on CD ROM.

Model	OX 4100 H
DO concentration (mg/L)	0,00 - 20,00/0 - 90,0 (according to the sensor)
DO concentration resolution (mg/L)	0,01/0,1 (according to the sensor)
DO accuracy	±0,5% (between +5 and +30 °C)
DO calibration	Water saturated air
DO saturation (%)	0,0 - 200,0/0 - 600 (according to the sensor)
DO barometric pressure range	500 - 1100 mbar
DO salinity compensation (g/L)	Manual input
DO salinity factor (ppt)	0,0 - 35
Temperature range (°C)	0,0...+100,0
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2
Temperature compensation	0 to +50 °C (automatic)
Data logging capacity	5000 points
Data logging - log function	Selectable between 1 min and 1 h
Display	Graphic LCD with LED backlight
Connections	8-pin connection for oxygen and temperature
Outputs	Watertight USB connection (slave, bidirectional)
Compliance	IP 67/GLP

Description	Pk	Cat. No.
Handheld dissolved oxygen meter OX 4100 H, pHenomenal®, with galvanic oxygen probe	1 SET	664-0176

Description	Connection	Pk	Cat. No.
Dissolved oxygen probe, pHenomenal®			
pHenomenal® OXY11-3, galvanic (resolution 0,1 mg/L) probe	3 m cable, 8-pin	1	664-0042
Accessories			
CellOx® 325 with OxiCal®-SL calibration vessel	1,5 m cable	1	715-2917
CellOx® 325-3 with OxiCal®-SL calibration vessel	3 m cable	1	664-0511
CellOx® 325-6 with OxiCal®-SL calibration vessel	6 m cable	1	662-0391
CellOx® 325-10 with OxiCal®-SL calibration vessel	10 m cable	1	662-0392
CellOx® 325-15 with OxiCal®-SL calibration vessel	15 m cable	1	662-0393
CellOx® 325-20 with OxiCal®-SL calibration vessel	20 m cable	1	662-0394
pHenomenal® storage/measuring vessel		1	662-1248
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP		1	662-1225
pHenomenal® dissolved oxygen maintenance kit (incl. abrasive foil, electrolyte (40 ml), cleaning solution (30 ml), 3 exchange membrane caps)		1	664-0049
pHenomenal® field carrying case		1	662-1168
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor		1	662-1169



664-0177

DISSOLVED OXYGEN METER, HANDHELD, PHENOMENAL® OX 4110 H, WITH OPTICAL OXYGEN PROBE

This user friendly portable instrument with robust IP 67 rated housing provides high resolution and accuracy for precise optical oxygen measurements in field applications. Complete with waterproof USB output for connection to a computer. GLP compliant.

- Large graphic LCD with continuous LED backlight shows both oxygen and temperature values simultaneously
- Data logging function selectable between 1 min and 1 h
- 5000 data set memory capacity with automatic storing; additional 200 data set memory for manual storage
- Automatic power shut-off: Adjustable from 10 min to 24 h
- Advanced self-test and diagnostics (electrode efficiency diagnostic, drift control); calibration symbol shows when re-calibration is required
- Low energy consumption: 4× AA batteries for over 1000 operating hours

Ready to use portable oxygen kit OX 4110 H includes instrument in robust plastic carry case, optical oxygen probe OPOX 11-3 with built-in temperature sensor, 3 m cable and stand, maintenance kit and instruction manual (22 languages) on CD ROM.

Model	OX 4110 H
DO concentration (mg/L)	0,00 - 20,00/0 - 50
DO concentration resolution (mg/L)	0,01/0,1%
DO accuracy	±0,1 mg/L or ±1% (0 - 20,00 mg/L / 0 - 200%); ±10% of value (>20 mg/L/200%)
DO calibration	Water saturated air
DO saturation (%)	0 - 200/200 - 500
DO barometric pressure range	500 - 1100 mbar
DO salinity compensation (g/L)	Manual input
DO salinity factor (ppt)	0,0 - 35
Temperature range (°C)	0,0...+50,0
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2
Temperature compensation	0 to +50 °C (automatic)
Data logging capacity	5000 data sets
Data logging - log function	Selectable between 1 min and 1 h
Display	Graphic LCD with LED backlight
Connections	8-pin connection for oxygen and temperature
Outputs	Watertight USB connection (slave, bidirectional)
Compliance	IP 67/GLP

Description	Pk	Cat. No.
Handheld dissolved oxygen meter OX 4110 H, pHenomenal®, with optical oxygen sensor OPOX 11-3	1 SET	664-0177

Description	Connection	Pk	Cat. No.
IDP optical dissolved oxygen sensor, pHenomenal® OPOX 11-3			
pHenomenal® OPOX 11-3 optical oxygen probe with built-in temperature sensor	8-pin, 1,5 m cable	1	664-0182
Accessories			
Replacement cap for optical oxygen probe OPOX 11-3		1	664-0183
pHenomenal® storage/measuring vessel		1	662-1248
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP		1	662-1225
pHenomenal® field carry case		1	662-1168



Handheld MD 8000 H pH kit

MULTI-PARAMETER METERS, HANDHELD, PHENOMENAL® MD 8000 H

These digital meters combine six parameters in one instrument: pH, mV, temperature, conductivity, dissolved oxygen and turbidity. IDP technology optimises use and makes measurement easier (no need to recalibrate when changing the meter and no need to adjust the meter's settings). The measured data is complete with serial number, settings and calibration data.

- One universal measuring channel
- Digital sensor recognition: The measured parameter and settings are recognised automatically
- Suitable for Intelligent Digital Probes (IDP)
- Suitable for measurements with cable length up to 100 metres
- 4500-point memory
- Easy to read backlit B/W graphic display
- Low energy consumption (1000 operating hours)

Each kit is supplied in a carry case with digital meter MD 8000 H, IDP pH/temperature electrode or conductivity/temperature cell or dissolved oxygen/temperature sensor, stand, buffers or standards, accessories, calibration certificate and instruction manual. Additional probes for other parameters can be added. Please contact your local Avantor sales office for further information on other electrodes available.

pH range	0 - 14
pH resolution	0,1/0,01/0,001
pH accuracy	±0,1, ±0,01, ±0,005
mV range	±2500; ±1200
mV resolution	0,1; 1
mV accuracy	±0,3; ±1
Conductivity range	0,01 µS/cm - 1000 mS/cm (depending on sensor)
Conductivity accuracy	±0,5% of value
Conductivity cell constant (cm ⁻¹)	Automatic
Resistivity range	1 Ωcm - 20 MΩcm (depending on sensor)
Salinity range	0 - 70
TDS range	0 mg/L - 199,9 g/L
DO concentration (mg/L)	0,00 - 20,00; 0,0 - 50,0
DO saturation (%)	0,0 - 200,0; 0 - 500
Temperature range (°C)	Auto: -5...+105
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2 K
Memory	4500 points
Data logging capacity	Up to 4500 data sets in automatic
Data logging - log function	Manual/time controlled
Display	Backlit B/W graphic LCD
Connections	1 measurement input
Calibration	Anycal 5-point customer buffer calibration
Calibration points	1 to 5 (automatic buffer recognition)
Interfaces	Mini USB-B (USB 1.1) for data downloads
IP rating	IP 67
Parameters	pH, mV, temperature, conductivity, dissolved oxygen, turbidity
Reference temperature	20/25 °C

Description	Pk	Cat. No.
Digital handheld phenomenal® MD 8000 H multi-parameter meter, pH kit, with intelligent gel plastic pH/temperature electrode IDP 711, 2 bottles of 50 ml pH buffers (1x pH 4,00 and 1x pH 7,00)	1 SET	665-0494
Digital handheld phenomenal® MD 8000 H multi-parameter meter, conductivity kit, with intelligent conductivity/temperature cell IDP 761-C with 1 bottle of 50 ml conductivity standard (1413 µS)	1 SET	665-0495
Digital handheld phenomenal® MD 8000 H multi-parameter meter, dissolved oxygen kit, with intelligent optical D.O./temperature sensor OPOX 11-3	1 SET	665-0496

Description	Temp. (°C)	Material	Electrolyte	ØxL (mm)	Diaphr.	Connection	Pk	Cat. No.
IDP pH electrodes, pHenomenal®								
pHenomenal® IDP 711 pH electrode	0...+80	Noryl	Gel	12x120	Fibre	1,5 m cable, IDP-plug	1	662-2296
pHenomenal® IDP 721 pH electrode	0...+100	Glass	KCl 3 mol/L, refillable	12x120	Ceramic	1,5 m cable, IDP-plug	1	662-2297
pHenomenal® IDP 721-LS pH electrode	-5...+100	Glass	KCl 3 mol/L, refillable	12x120	Platinum wire	1,5 m cable, IDP-plug	1	662-2298
IDP conductivity cell, pHenomenal® IDP 761-C								
pHenomenal® IDP 761-C intelligent conductivity cell, 4-cell graphite	0...+100	Epoxy		15,3x120		IDP plug, 1,5 m cable and universal connector	1	663-0356
IDP optical dissolved oxygen sensor, pHenomenal® OPOX 11-3								
pHenomenal® OPOX 11-3 optical oxygen probe with built-in temperature sensor	0...+50	Epoxy		15,3x140		1,5 m cable, IDP-plug	1	664-0182
Accessories								
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP							1	662-1225



DISSOLVED OXYGEN METER, BENCH, PHENOMENAL® OX 4100L

This user friendly instrument with articulated electrode stand and IP 43-rated housing provides high resolution and accuracy for precise measurements. With USB output for connection to a computer. GLP compliant.

- Large graphic LCD with continuous LED backlight showing both DO and temperature values simultaneously
- Data logging function selectable between 1 min and 1 h
- Memory capacity of 5000 data sets
- Automatic power shut-off: Adjustable from 10 min to 24 h
- Advanced self-test and diagnostics (electrode efficiency diagnostic, drift control); calibration symbol shows when re-calibration is required
- Low energy consumption. Choice of mains supply or 4x 'AA' batteries for over 1000 operating hours

Ready to use oxygen OX 4100L kit includes instrument, galvanic oxygen probe OXY 11-3 with built-in temperature sensor, 3 m cable and articulated stand, maintenance kit and instruction manual (22 languages) on CD ROM.

Model	OX 4100L
DO concentration (mg/L)	0,00 - 20,00/0 - 90,0 (according to the sensor)
DO concentration resolution (mg/L)	0,01/0,1 (according to the sensor)
DO accuracy	±0,5% (between +5 and +30 °C)
DO calibration	Water saturated air
DO saturation (%)	0,0 - 200,0/0 - 600 (according to the sensor)
DO barometric pressure range	6 - 1100 mbar (automatic)
DO salinity compensation (g/L)	Manual input
DO salinity factor (ppt)	0,0 - 35
Temperature range (°C)	0,0...+50,0
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2
Temperature compensation	0 to +50 °C (automatic)
Data logging capacity	5000 data sets
Data logging - log function	Selectable between 1 min and 1 h
Display	Graphic LCD with LED backlight
Connections	8-pin connection for oxygen and temperature
Outputs	Watertight (IP 43) USB connection (slave, bidirectional)
Compliance	IP 43/GLP

Description	Pk	Cat. No.
Bench dissolved oxygen meter OX 4100L, pHenomenal®	1 SET	664-0175

Description	Material	Connection	Pk	Cat. No.
Dissolved oxygen probe, pHenomenal®				
pHenomenal® OXY11-3, galvanic (resolution 0,1 mg/L) probe	Epoxy	3 m cable, 8-pin	1	664-0042
Accessories				
CellOx® 325 with OxiCal®-SL calibration vessel		1,5 m cable	1	715-2917
CellOx® 325-3 with OxiCal®-SL calibration vessel		3 m cable	1	664-0511
CellOx® 325-6 with OxiCal®-SL calibration vessel		6 m cable	1	662-0391
pHenomenal® electrode storage tube			1	662-1167
pHenomenal® storage/measuring vessel			1	662-1248
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP			1	662-1225
pHenomenal® dissolved oxygen maintenance kit (incl. abrasive foil, electrolyte (50 ml), cleaning solution (30 ml), 3 exchange membrane caps)			1	664-0049
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor			1	662-1169



pH/CONDUCTIVITY TESTER, pH/CO1030

This tester is a convenient pen instrument for measuring the following water quality parameters: pH, conductivity, TDS, salinity and temperature.

- Graphic LCD, IP 67 waterproof housing
- Replaceable electrode
- Automatic temperature compensation; automatic calibration and buffer recognition
- HOLD function, battery indicator, automatic power off function after 10 minutes of non use
- Non volatile memory stores up to 50 sets of data (pH/conductivity/TDS/salinity and temperature) even if power is lost
- Belt clip for easy storage when not in use

Warranty: 1 year (instrument)/6 months (electrode)

Supplied with pre-installed pH/conductivity electrode assembly and electrode cap, manual and set of 4 batteries.

Model	pH/CO1030
pH range	0,00 - 14,00
pH resolution	0,01
pH accuracy	±0,2
pH calibration	1-, 2- or 3-point
Automatic buffer recognition	pH 7,00/4,01/10,01 or pH 6,86/4,00/9,18
Conductivity range	0 µS/cm - 20,00 mS/cm
Conductivity resolution	Minimum 1 µS/cm
Conductivity accuracy	±1% FS
Salinity range	0,0 - 10,0 ppt
Salinity resolution	0,1 ppt
Salinity accuracy	±1% FS
TDS range	0 mg/L - 20,00 g/L
TDS resolution	Minimum 1 mg/L
TDS accuracy	±1% FS
TDS conversion factor	0,30 - 1,00 (default: 0,65)
Temperature range (°C)	-5,0...+60,0
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,5
Temperature compensation	Automatic (-5,0...+60,0 °C)
Data logging capacity	50 data sets
Power supply	4× LR44 batteries
W×D×H (mm)	44×25×200
Weight (kg)	0,095
Compliance	IP 67
Reference temperature	15,0 - 25,0 °C

Description	Pk	Cat. No.
pH/conductivity tester, pH/CO1030	1	665-0480
Description	Pk	Cat. No.
Accessories		
pH/conductivity electrode replacement kit (incl. replacement electrode, electrode collar, 2× O-rings, and electrode cap)	1	662-2271
Electrode storage cap, white	1	665-0481
Replacement battery compartment	1	662-0124



Handheld MD 8000 H pH kit

MULTI-PARAMETER METERS, HANDHELD, PHENOMENAL® MD 8000 H

These digital meters combine six parameters in one instrument: pH, mV, temperature, conductivity, dissolved oxygen and turbidity. IDP technology optimises use and makes measurement easier (no need to recalibrate when changing the meter and no need to adjust the meter's settings). The measured data is complete with serial number, settings and calibration data.

- One universal measuring channel
- Digital sensor recognition: The measured parameter and settings are recognised automatically
- Suitable for Intelligent Digital Probes (IDP)
- Suitable for measurements with cable length up to 100 metres
- 4500-point memory
- Easy to read backlit B/W graphic display
- Low energy consumption (1000 operating hours)

Each kit is supplied in a carrying case with digital meter MD 8000 H, IDP pH/temperature electrode or conductivity/temperature cell or dissolved oxygen/temperature sensor, stand, buffers or standards, accessories, calibration certificate and instruction manual. Additional probes for other parameters can be added. Please contact your local Avantor sales office for further information on other electrodes available.

pH range	0 - 14
pH resolution	0,1/0,01/0,001
pH accuracy	±0,1, ±0,01, ±0,005
mV range	±2500; ±1200
mV resolution	0,1; 1
mV accuracy	±0,3; ±1
Conductivity range	0,01 µS/cm - 1000 mS/cm (depending on sensor)
Conductivity accuracy	±0,5% of value
Conductivity cell constant (cm ⁻¹)	Automatic
Resistivity range	1 Ωcm - 20 MΩcm (depending on sensor)
Salinity range	0 - 70
TDS range	0 mg/L - 199,9 g/L
DO concentration (mg/L)	0,00 - 20,00; 0,0 - 50,0
DO saturation (%)	0,0 - 200,0; 0 - 500
Temperature range (°C)	Auto: -5...+105
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2 K
Memory	4500 points
Data logging capacity	Up to 4500 data sets in automatic
Data logging - log function	Manual/time controlled
Display	Backlit B/W graphic LCD
Connections	1 measurement input
Calibration	Anycal 5-point customer buffer calibration
Calibration points	1 to 5 (automatic buffer recognition)
Interfaces	Mini USB-B (USB 1.1) for data downloads
IP rating	IP 67
Parameters	pH, mV, temperature, conductivity, dissolved oxygen, turbidity
Reference temperature	20/25 °C

Description	Pk	Cat. No.
Digital handheld phenomenal® MD 8000 H multi-parameter meter, pH kit, with intelligent gel plastic pH/temperature electrode IDP 711, 2 bottles of 50 ml pH buffers (1 x pH 4,00 and 1 x pH 7,00)	1 SET	665-0494
Digital handheld phenomenal® MD 8000 H multi-parameter meter, conductivity kit, with intelligent conductivity/temperature cell IDP 761-C with 1 bottle of 50 ml conductivity standard (1413 µS)	1 SET	665-0495
Digital handheld phenomenal® MD 8000 H multi-parameter meter, dissolved oxygen kit, with intelligent optical D.O./temperature sensor OPOX 11-3	1 SET	665-0496

Description	Temp. (°C)	Material	Electrolyte	ØxL (mm)	Diaphr.	Connection	Pk	Cat. No.
IDP pH electrodes, pHenomenal®								
pHenomenal® IDP 711 pH electrode	0...+80	Noryl	Gel	12x120	Fibre	1,5 m cable, IDP-plug	1	662-2296
pHenomenal® IDP 721 pH electrode	0...+100	Glass	KCl 3 mol/L, refillable	12x120	Ceramic	1,5 m cable, IDP-plug	1	662-2297
pHenomenal® IDP 721-LS pH electrode	-5...+100	Glass	KCl 3 mol/L, refillable	12x120	Platinum wire	1,5 m cable, IDP-plug	1	662-2298
IDP conductivity cell, pHenomenal® IDP 761-C								
pHenomenal® IDP 761-C intelligent conductivity cell, 4-cell graphite	0...+100	Epoxy		15,3x120		IDP plug, 1,5 m cable and universal connector	1	663-0356
IDP optical dissolved oxygen sensor, pHenomenal® OPOX 11-3								
pHenomenal® OPOX 11-3 optical oxygen probe with built-in temperature sensor	0...+50	Epoxy		15,3x140		1,5 m cable, IDP-plug	1	664-0182
Accessories								
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP							1	662-1225



665-0311

MULTI-PARAMETER METER (pH/CONDUCTIVITY/DO), HANDHELD, PHENOMENAL® MU 6100 H

This user friendly portable instrument with robust IP 67 rated housing provides high resolution and accuracy for precise measurements of pH, mV, conductivity and oxygen in field applications (can only be used to measure any two of these at the same time). Complete with waterproof USB output for connection to a computer. GLP compliant.

- Large graphic LCD with continuous LED backlight showing the measured parameter and temperature value simultaneously
- Data logging function selectable between 1 min and 1 h
- 5000 data set memory capacity with automatic storing; additional 200-point memory for manual storage
- Automatic power shut-off: Adjustable from 10 min to 24 h
- Automatic buffer recognition of DIN and NIST buffers
- (1,68 / 4,00 / 6,86 / 9,18 / 12,54)
- Three additional technical buffers at 25 °C (4,00 / 7,00 / 10,00) in memory
- Advanced self-test and diagnostics (electrode efficiency diagnostic, drift control); calibration symbol shows when recalibration is required
- Low energy consumption: 4× AA batteries for over 1000 operating hours

Ready to use kit **MU 6100 H S1** includes multi-parameter meter in robust plastic carrying case, gel epoxy pH electrode 111 with built-in temperature sensor (1 m cable), starter kit (two pH buffers, one plastic beaker), conductivity probe CO 11 with built-in temperature sensor (1,5 m cable), stand and instruction manual (22 languages) on CD ROM. The kit **MU 6100 H S2** additionally includes the galvanic oxygen probe OXY 11-3 with built-in temperature sensor (3 m cable) and maintenance kit.

Conductivity probes for low conductivities are available on request. Please contact your local Avantor sales office for further information.

Model	MU 6100 H
pH range	–2,000...+20,000
pH resolution	0,1/0,01/0,001 (selectable)
pH accuracy	±0,005 + 1 digit
pH calibration	Up to 5 points
Automatic buffer recognition	TITRINORM® buffers at 25 °C: 4,00/6,98/9,94 NIST/DIN 19266 (1,68/4,00/6,86/9,18/12,54) Technical buffers at 25 °C: 4,00/7,00/10,00
mV range	±1200,0/±2500
mV resolution	0,1/1
mV accuracy	±0,3/±1
Conductivity range	0,001 µS/cm - 1000 mS/cm
Conductivity resolution	0,1 µS/cm
Conductivity accuracy	±0,5% of measured value
Conductivity cell constant (cm ⁻¹)	Depending on probe
Conductivity calibration	1 point
Resistivity range	1 Ω/cm - 999 MΩ/cm
Resistivity accuracy	±0,5% of measured value
Salinity range	0,00 - 70 ppt
TDS range	0 - 1999 mg/L / 2,00 - 19,99 g/L / 20,0 - 199,9 g/L
TDS resolution	1 mg/L / 0,01 g/L / 0,1 g/L
DO concentration (mg/L)	0,00 - 20,00; 0,0 - 90,0
DO concentration resolution (mg/L)	0,1%; 0,01
DO saturation (%)	0,0 - 200,0; 0 - 600
DO accuracy	±0,5% of value (between 5...30 °C)
DO calibration	Water saturated air
Temperature range (°C)	Auto: –5,0...+105,0; manual: –25...+130
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2
Temperature compensation	Automatic/manual
Data logging capacity	5000 data sets
Data logging - log function	Selectable between 1 s and 1 h (selectable intervals: 1 s, 5 s, 10 s, 30 s, 1 min, 5 min, 10 min, 15 min, 30 min, 60 min)
Display	Graphic LCD with LED backlight
Connections	BNC for pH/banana for temperature/8-pin for conductivity and DO
Power supply	4× AA batteries
Compliance	IP 67/GLP
Outputs	Waterproof USB connection (slave, bidirectional)

Description	Pk	Cat. No.
MU 6100 H S1 kit, with pH electrode and conductivity probe	1 SET	665-0311
MU 6100 H S2 kit, with pH electrode, conductivity and oxygen probes	1 SET	665-0312

Description	Temp.	Material	Electrolyte	Ø×L mm	Diaphr.	Connection	pH value	pH accuracy	pH buffer type	Pk	Cat. No.
Conductivity cell, pHenomenal®											
pHenomenal® CO11, 2-pole graphite, integrated NTC 30	0...+80	Epoxy		15,3×120		8 pin, 1,5 m cable				1	663-0147
Dissolved oxygen probe, pHenomenal®											
pHenomenal® OXY11-3, galvanic (resolution 0,1 mg/L) probe		Epoxy				3 m cable, 8-pin				1	664-0042
pH electrodes, pHenomenal®											
pHenomenal® 111 pH electrode, 3 in 1, with temperature sensor		Epoxy	Gel	12×120	Ceramic	BNC, 1 m cable				1	662-1157
Accessories											
pHenomenal® electrode storage tube										1	662-1167
pHenomenal® storage/measuring vessel										1	662-1248
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP										1	662-1225
pHenomenal® dissolved oxygen maintenance kit (incl. abrasive foil, electrolyte (50 ml), cleaning solution (30 ml), 3 exchange membrane caps)										1	664-0049
pHenomenal® field carrying case										1	662-1168
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor										1	662-1169
Conductivity standards at 25 °C, potassium chloride solutions											
KCl 0,01 mol/L										100 ml	83607.180
KCl 0,1 mol/L										500 ml	83608.260
Accessories											
Potassium chloride 3 mol/L (3 N) in aqueous solution AVS TITRINORM										100 ml	83605.180
Potassium chloride saturated with silver chloride aqueous solution 3 mol/L (3 N) in aqueous solution AVS TITRINORM for filling electrodes										500 ml	83606.260
Electrode cleaning solutions											
Electrode cleaning solution pepsin/hydrochloric acid for removal of proteins										100 ml	83603.180
Buffer solutions in bottles											
							4,00	±0,02	Phthalate	100 ml	32095.184
							7,00	±0,02	Phosphate	100 ml	32096.187
							10,00	±0,02	Carbonate	100 ml	32040.185

Designed for protection

VWR® Lab bric-a-brac

- Storage and organisation
- Transportation
- Recording and labelling
- Lighting
- Other handy stuff

Discover this
VWR Handy
Solution Guide
on **vwr.com**



MULTI-PARAMETER METER (pH/CONDUCTIVITY/DO), BENCH, PHENOMENAL® MU 6100 L

This user friendly instrument, with articulated electrode stand and IP 43-rated housing, provides high resolution and accuracy for precise multi-parameter measurements. This meter can either measure pH/mV and conductivity or pH/mV and oxygen simultaneously. Complete with USB output for connection to a computer. GLP compliant.

- Large graphic LCD with continuous LED backlight shows the measured parameter and the temperature value simultaneously
- Data logging function selectable between 1 min and 1 h; memory capacity of 5000 data sets
- Automatic power shut-off: Adjustable from 10 min to 24 h
- Automatic buffer recognition of DIN and NIST buffers (1,68 / 4,00 / 6,86 / 9,18 / 12,54)
- Three additional technical buffers at 25 °C (4,00 / 7,00 / 10,00) in memory
- Advanced self-test and diagnostics (electrode efficiency diagnostic, drift control); calibration symbol shows when recalibration is required
- Low energy consumption. Choice of mains supply or 4x AA batteries for over 1000 operating hours

Ready to use **MU 6100 L S1** kit includes bench multi-parameter meter, glass pH electrode 221 with built-in temperature sensor (1 m cable), conductivity probe CO 11 with built-in temperature sensor (1,5 m cable), articulated stand, two pH buffers, one conductivity standard and one plastic beaker, and instruction manual (22 languages) on CD ROM. The **MU 6100 L S2** kit also includes a galvanic oxygen probe OX 11-3 with built-in temperature sensor (3 m cable).

Conductivity probes for low conductivities are available on request. Please contact your local Avantor sales office for further information.

Model	MU 6100 L, S1 kit	MU 6100 L, S2 kit
pH range	-2,000...+19,999	
pH resolution	0,1/0,01/0,001 (selectable)	
pH accuracy	±0,1/±0,01/±0,005	
pH calibration	Up to 5 points	
Automatic buffer recognition	VWR® Chemicals TITRINORM® buffers at 25 °C: 4,00/6,98/9,94 NIST/DIN 19266 (1,68/4,00/6,86/9,18/12,54) Technical buffers at 25 °C: 4,00/7,00/10,00	
mV range	±1200,0/±2500	
mV resolution	0,1/1	
mV accuracy	±0,3/±1	
Conductivity range	0,001 µS/cm - 1000 mS/cm	
Conductivity resolution	0,1 µS/cm	
Conductivity accuracy	±0,5% of measured value	
Conductivity cell constant (cm ⁻¹)	0,001 - 25 (depending on probe)	
Conductivity calibration	1 point	
Resistivity range	1 Ω/cm - 999 MΩ/cm	
Resistivity accuracy	±0,5% of measured value	
Salinity range	0,00 - 70 ppt	
TDS range	0 - 1999 mg/L / 2,00 - 19,99 g/L / 20,0 - 199,9 g/L	
TDS resolution	1 mg/L / 0,01 g/L / 0,1 g/L	
DO concentration (mg/L)	0,00 - 20,00; 0,0 - 90,0	
DO concentration resolution (mg/L)	0,1%; 0,01 (depending on sensor)	
DO saturation (%)	0,0 - 200,0; 0 - 600 (depending on sensor)	
DO accuracy	±0,5% of value (between 5...30 °C)	
DO calibration	Saturated air	
Temperature range (°C)	Auto: -5,0...+105,0; manual: -25...+130	
Temperature resolution (°C)	0,1/1	
Temperature accuracy (°C)	±0,2	
Temperature compensation	Automatic/manual	
Data logging capacity	5000 data sets	
Data logging - log function	Selectable between 1 s and 1 h (selectable intervals: 1 s, 5 s, 10 s, 30 s, 1 min, 5 min, 10 min, 15 min, 30 min, 60 min)	
Display	Graphic LCD with LED backlight	
Connections	BNC for pH/banana for temperature/8-pin for conductivity and DO	
Power supply	Mains supply or 4x AA batteries	
Compliance	IP 43/GLP	
Outputs	Waterproof USB connection (slave, bidirectional)	

Description	Pk	Cat. No.
Bench top pH/mV/conductivity/DO meter pHenomenal® MU 6100 L S1 kit	1 SET	665-0309
Bench top pH/mV/conductivity/DO meter pHenomenal® MU 6100 L S2 kit	1 SET	665-0310

Description	Temp.	Material	Electrolyte	ØxL	Diaphr.	Connection	Pack type	Reference temperature	Pk	Cat. No.
Conductivity cell, pHenomenal®										
pHenomenal® CO11, 2-pole graphite, integrated NTC 30	0...+80	Epoxy		15,3x120		8 pin, 1,5 m cable			1	663-0147
Dissolved oxygen probe, pHenomenal®										
pHenomenal® OXY11-3, galvanic (resolution 0,1 mg/L) probe		Epoxy				3 m cable, 8-pin			1	664-0042
pH electrodes, pHenomenal®										
pHenomenal® 111 pH electrode, 3 in 1, with temperature sensor		Epoxy	Gel	12x120	Ceramic	BNC, 1 m cable			1	662-1157
Accessories										
pHenomenal® electrode storage tube									1	662-1167
pHenomenal® storage/measuring vessel									1	662-1248
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP									1	662-1225
pHenomenal® dissolved oxygen maintenance kit (incl. abrasive foil, electrolyte (50 ml), cleaning solution (30 ml), 3 exchange membrane caps)									1	664-0049
pHenomenal® field carrying case									1	662-1168
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor									1	662-1169
Conductivity standards at 25 °C, potassium chloride solutions										
KCl 0,01 mol/L							Plastic bottle	25 °C	100 ml	83607.180
KCl 0,1 mol/L							Plastic bottle	25 °C	500 ml	83608.260
Accessories										
Potassium chloride 3 mol/L (3 N) in aqueous solution AVS TITRINORM							Plastic bottle		100 ml	83605.180
Potassium chloride saturated with silver chloride aqueous solution 3 mol/L (3 N) in aqueous solution AVS TITRINORM for filling electrodes							Plastic bottle		500 ml	83606.260
Electrode cleaning solutions										
Electrode cleaning solution pepsin/hydrochloric acid for removal of proteins							Plastic bottle		100 ml	83603.180
Buffer solutions in bottles										
							Plastic bottle	20 °C	100 ml	32095.184
							Plastic bottle	20 °C	100 ml	32096.187
							Plastic bottle	20 °C	100 ml	32040.185

designed for your space

VWR® for your space

- Chairs
- Seating
- Stools
- Lights
- Trolleys
- Ladders
- PCR workstation
- Glove boxes
- Organisers
- Mats
- Log books
- Markers

Discover this
VWR Handy
Solution Guide
on **vwr.com**

PB18001-EN



General purpose bench MD 8000 L pH kit with certificate

BENCH TOP DIGITAL MULTI-PARAMETER INSTRUMENTS, PHENOMENAL® MD 8000 L

These digital meters combine six parameters in one instrument: pH, mV, temperature, conductivity, dissolved oxygen and turbidity. IDP technology optimises use and makes measurement easier (no need to recalibrate when changing the meter, and no need to adjust the meter's settings). The measured data is complete with serial number, settings and calibration data.

- One universal measuring channel
- Digital sensor recognition: Measured parameter and settings are recognised automatically
- Suitable for Intelligent Digital Probes (IDP)
- Suitable for measurements with cable length up to 100 metres
- 4500-point memory
- Easy to read backlit B/W graphic display
- Low energy consumption (1000 operating hours)

Each kit is supplied with a bench top MD 8000 L or LB multi-parameter instrument, 1 intelligent refillable glass combined pH/temperature electrode, 2 bottles of 50 ml pH buffers (pH 4,00 and 7,00), 1 articulated stand, calibration certificate and instruction manual in 6 languages on CD. Please contact your local Avantor sales office for further information on other available electrodes.

pH range	0 - 14
pH resolution	0,1/0,01/0,001
pH accuracy	±0,1; ±0,01; ±0,005
mV range	±2500; ±1200
mV resolution	0,1; 1
mV accuracy	±0,3; ±1
Conductivity range	0,01 µS/cm - 1000 mS/cm (depending on sensor)
Conductivity accuracy	±0,5% of value
Conductivity cell constant (cm ⁻¹)	Automatic
Resistivity range	1 Ωcm - 20 MΩcm (depending on sensor)
Salinity range	0 - 70
TDS range	0 mg/L - 199,9 g/L
DO concentration (mg/L)	0,00 - 20,00; 0,0 - 50,0
DO saturation (%)	0,0 - 200,0; 0 - 500
Temperature range (°C)	Auto: -5...+105
Temperature resolution (°C)	0,1
Temperature accuracy (°C)	±0,2 K
Data logging capacity	Up to 4500 data sets in automatic
Data logging - log function	Yes
Display	Backlit B/W graphic
Connections	1 measurement input
Power supply	230 V with power supply or 4x 1,5 V AA (supplied) or via USB port
Calibration	Anycal 5-point customer buffer calibration Max. 10 calibration storage 1 to 999 days calibration timer
Calibration points	1 - 5 (automatic buffer recognition)
Interfaces	Mini USB-B (USB 1.1) for data downloads
IP rating	IP 43
Parameters	pH, mV, temperature, conductivity, dissolved oxygen, turbidity
Reference temperature	20 / 25 °C

Description	Pk	Cat. No.
Digital bench top pHenomenal® MD 8000 L multi-parameter meter pH kit with 1 intelligent refillable glass, single junction combined pH/temperature electrode IDP 721	1 SET	665-0498
Digital bench top pHenomenal® MD 8000 LB multi-parameter meter pH kit for Life Science applications with 1 intelligent refillable glass, double platinum junction combined pH/temperature electrode IDP 721-LS	1 SET	665-0499

Description	Temp. (°C)	Material	Electrolyte	ØxL (mm)	Diaphr.	Connection	Pk	Cat. No.
IDP pH electrodes, pHenomenal®								
pHenomenal® IDP 711 pH electrode	0...+80	Noryl	Gel	12x120	Fibre	1,5 m cable, IDP-plug	1	662-2296
pHenomenal® IDP 721 pH electrode	0...+100	Glass	KCl 3 mol/L, refillable	12x120	Ceramic	1,5 m cable, IDP-plug	1	662-2297
pHenomenal® IDP 721-LS pH electrode	-5...+100	Glass	KCl 3 mol/L, refillable	12x120	Platinum wire	1,5 m cable, IDP-plug	1	662-2298
IDP conductivity cell, pHenomenal® IDP 761-C								
pHenomenal® IDP 761-C intelligent conductivity cell, 4-cell graphite	0...+100	Epoxy		15,3x120		IDP plug, 1,5 m cable and universal connector	1	663-0356
IDP optical dissolved oxygen sensor, pHenomenal® OPOX 11-3								
pHenomenal® OPOX 11-3 optical oxygen probe with built-in temperature sensor	0...+50	Epoxy		15,3x140		1,5 m cable, IDP-plug	1	664-0182
Accessories								
pHenomenal® communication kit (CD-ROM, USB cable, manual), software is compatible with Windows 7, 8, 10 and XP							1	662-1225
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor							1	662-1169

Electrodes & Sensors

For every application you can find a selection of electrodes, from basic electrodes to routine and even the newest Intelligent Digital Probes, (IDP). This selector will guide you through this brochure to find the electrode you need.

VWR® has an extended range of electrodes:

Professional IDP electrodes for pH, conductivity and oxygen:
For other parameters like redox and turbidity. Contact your local Avantor sales office.

- Digital signals for best results
- Intelligent for best DATA
- To be used with MD 8000 models

Routine pHenomenal® electrodes for pH, redox, conductivity and dissolved oxygen

- Good quality
- Professional use

Universal pH electrodes

- For entry level

Special pH electrodes

- For special applications
- Professional use



Applications		Routine pHenomenal® electrodes								Professional IDP pH electrodes			Universal pH electrodes						
pHenomenal® electrodes		Page 42								Page 40			Page 43						
		pHenomenal 110, gel	pHenomenal 111, 3 i 1 gel *	pHenomenal 211, refillable *	pHenomenal 220, refillable	pHenomenal 221, refillable *	pHenomenal LS 221 (Tris) *	pHenomenal SPEAR 220, spear type	pHenomenal MIC 220, refillable, Micro	pHenomenal IDP 711	pHenomenal IDP 721	pHenomenal IDP 721-LS	Single junction SJ 113/114/115	Glass, single junction sj 223/224/225	Double junction dj 113/114/115	Surface sf 113/114/115	Surface 223/224/225	Semi-micro sm 223/224/225	Spear 223/224/225
General purpose		s	r	r	s	r	r			r	r	r	s	s	s				
Agriculture	Fertiliser solutions				s	r	r				r	r		r	r				
	Fruit							r											r
	Vegetables							r											r
Beverages	Beer/lemonade			r	r	r	r				r	r		s	s				
	Fruit juice			r	r	r	r				r	r		s	s				
	Mineral water	s	s	r	r	r	r			s	r	r	s	s	s				
	Spirits/wine			r	r	r	r				r	r		s	s				
Chemistry	Acid solutions			r	s	r	r				r	r		s	s				
	Ammonia			s	s	s	s				s	s		s					
	Bleach and dying solutions			s	s	s	s				s	s		s	s				
	Emulsions			r	r	r	r	r			r	r		r	s				
	Viscous samples						s	r				s							r
	Semi-solid samples						s	r				s							r
	Tris buffers						r					r							
Cosmetics	Cream						s	r				s							r
	Lotion			r	s	r	r				r	r							s
	Make-up (viscous)						s	r											r
	Shaving foam															s	s		
	Soap							r											r
	Toothpaste			s		s		r			s								r
Field measurements	Ground, lake and river	s	r	r		s	s			r	s	s	s		s				
Food	Bread							r											r
	Sugar-containing products	s	s	r	s	r	r	s		s	r	r		s	s				s
	Coffee extract			r	s	r	r		r		r	r		r	r			r	
	Soups		s	r	s	r	r	s		s	r	r	s	r	r				s
	Meat/fish							r								s	s		r
Dairy	Butter							s											s
	Cheese							r											r
	Cream		s	s	s	r	s	r	r	s	r	s							r
	Milk		s	s	r	r	r			s	r	r		s	s				
	Yoghurt		s	r	s	r	r	r	r	s	r	r		s	s				r
Pharma/biotech	Small sample quantities								r									r	
	Cell culture						r		r			r						r	
	Agar/agar							r								r	r		r
	Protein-rich samples						r					r							
Surfaces	Skin/textiles/agar															r	r		
Small volumes	Micro titration plates/test tubes								r									r	
Solids								r											r
Washing agents	Detergents			s	s	r	r			s	r	r		s	s				
	Dishwashing liquid			s	s	r	r			s	r	r		s	s				
	Disinfectants				s	r	r				r	r		s	s				
	Soap solutions			s	s	r	r			s	r	r		s	s				
Water	Demineralised water					s	s				s	s			s				
	Aquariums	s	r	r	s	s	s			r	s	s	s	s	r				
	Cooling water		s	r	s	s	s			s	s	s			s				
	Drinking water	s	r	r	s	r	r			r	r	r	s	s	s				
	Salt water	s	r	r	s	r	r			r	r	r	s	r	r				
	Pool water	s	r	r	s	s	s			r	s	s	s	s	s				
	Surface/rain water	s	r	r	s	s	s			r	s	s	s	s	s				
	Wastewater	s	r	r	s	s	s			r	s	s	s	s	s				
Non aqueous samples (solvents/alcohols)					s	s	s				s	s							

r recommended s suggested

Applications		Special pH electrodes																	
pHenomenal® electrodes		Page 44																	
		Thin, Pellon junction	Thin, ceramic junction	Thin, Pellon junction	Thin, Pellon junction	Semi-micro, ceramic junction	Semi-micro, Pellon junction	Semi-micro, Pellon junction	Semi-micro, Pellon junction	Flat tip, double junction (HDPE/ Pellon)	Flat tip, double junction (HDPE/ Pellon)	Flat tip, double junction (HDPE/ Pellon)	Flat tip, double junction (HDPE/ Pellon)	Flat tip, double junction (HDPE/ Pellon)	Flat tip, double junction (HDPE/ Pellon), fluoride resistant bulb	Large surface flat tip, HDPE junction	Large surface flat tip, HDPE junction	Spear tip, double junction (PVDF/ Pellon)	Spear tip, double junction (PVDF/ Pellon)
General purpose																			
Agriculture	Fertiliser solutions																		
	Fruit																		
	Vegetables																		
Beverages	Beer/lemonade																		
	Fruit juice																		
	Mineral water																		
	Spirits/wine																		
Chemistry	Acid solutions																		
	Ammonia																		
	Bleach and dying solutions																		
	Emulsions																		
	Viscous samples																		
	Semi-solid samples																		
	Tris buffers																		
Cosmetics	Cream																		
	Lotion																		
	Make-up (viscous)																		
	Shaving foam																		
	Soap																		
	Toothpaste																		
Field measurements	Ground, lake and river																		
Food	Bread																		
	Sugar-containing products																		
	Coffee extract																		
	Soups																		
	Meat/fish																		
Dairy	Butter																		
	Cheese																		
	Cream																		
	Milk																		
	Yoghurt																		
Pharma/biotech	Small sample quantities																		
	Cell culture																		
	Agar/agar																		
	Protein-rich samples																		
Surfaces	Skin/textiles/agar																		
Small volumes	Micro titration plates/test tubes																		
Solids																			
Washing agents	Detergents																		
	Dishwashing liquid																		
	Disinfectants																		
	Soap solutions																		
Water	Demineralised water																		
	Aquariums																		
	Cooling water																		
	Drinking water																		
	Salt water																		
	Pool water																		
	Surface/rain water																		
	Wastewater																		
Non aqueous samples (solvents/alcohols)																			



pHenomenal® IDP 711 pH electrode

IDP pH ELECTRODES, PHENOMENAL®

These IDP (Intelligent Digital Probe) pH/temperature electrodes can be used with the pHenomenal® MD 8000 H and MD 8000 L multi-parameter meters.

- Calibration data (serial number, calibration status) is stored in the electrode/probe, transmitted to the meter and displayed
- Proven reliability and accuracy
- Correct measurement results due to direct signal processing in the sensor and digital transmission of values
- All parameters are easily measured with cable lengths of up to 100 m
- Same universal connector for all electrodes and probes

Temperature probe: NTC 30 kOhm

The electrodes can provide the following data shown on the meter's screen:

- Model name
- Serial number
- Calibration status (+++, ++, +, –, blank)
- Calibration history includes the last 10 calibrations, including buffers used, mV values, etc.

Type	pH	Temp. (°C)	Material	Electrolyte	Diaphr.	Ø×L (mm)	Connection	Pk	Cat. No.
pHenomenal® IDP 711	0,000 - 14,000 (±0,004)	0...+80	Noryl	Gel	Fibre	12×120	1,5 m cable, IDP-plug	1	662-2296
pHenomenal® IDP 721	0,000 - 14,000 (±0,004)	0...+100	Glass	KCl 3 mol/L, refillable	Ceramic	12×120	1,5 m cable, IDP-plug	1	662-2297
pHenomenal® IDP 721-LS	0,000 - 14,000 (±0,004)	-5...+100	Glass	KCl 3 mol/L, refillable	Platinum wire	12×120	1,5 m cable, IDP-plug	1	662-2298



pHenomenal® IDP 761-C intelligent conductivity cell

IDP CONDUCTIVITY CELL, PHENOMENAL® IDP 761-C

This IDP (Intelligent Digital Probe) conductivity/temperature cell can be used with the pHenomenal® MD 8000 H and MD 8000 L multi-parameter meters.

- Calibration data (serial number, calibration status) is stored in the electrode/probe, transmitted to the meter and displayed
- Proven reliability and accuracy
- Correct measurement results due to direct signal processing in the sensor and digital transmission of values
- All parameters are easily measured with cable lengths of up to 100 m
- Same universal connector for all electrodes and probes

Temperature probe: NTC 30 kOhm

The electrodes can provide the following data, shown on the meter's screen

- Model name
- Serial number
- Calibration status (+++, ++, +, –, blank)
- Calibration history includes the last 10 calibrations, including buffers used, mV values, etc.

Description	Type	Conductivity (mS/cm)	Cell constant	Temp. (°C)	Material	Ø×L (mm)	Connection	Pk	Cat. No.
pHenomenal® IDP 761-C intelligent conductivity cell, 4-cell graphite	pHenomenal® IDP 761-C	1 µS/cm - 2000	0,475 cm ⁻¹	0...+100	Epoxy	15,3×120	IDP-plug, 1,5 m cable and universal connector	1	663-0356



Intelligent dissolved oxygen probe OPOX 11-3

IDP OPTICAL DISSOLVED OXYGEN SENSOR, PHENOMENAL® OPOX 11-3

This IDP (Intelligent Digital Probe) dissolved oxygen/temperature sensor can be used with the pHenomenal® MD 8000 H and MD 8000 L multi-parameter meters.

- Post modern type of oxygen measurement: No chemicals, no electrolytes
- Calibration data (serial number, calibration status) is stored in the electrode/probe, transmitted to the meter and displayed
- Proven reliability and accuracy
- Correct measurement results due to direct signal processing in sensor and digital transmission of values
- All parameters are easily measured with cable lengths of up to 100 metres
- Same universal connector for all electrodes and probes

Measuring range concentration: 0,00 to 20,00 mg/L

Measuring range saturation: 0,0 to 200,0%

Measuring range partial pressure: 0,0 to 400 hPa

Accuracy: ±0,2 °C

The electrodes can provide the following data, shown on the meter's screen:

- Model name
- Serial number
- Calibration status (+++, ++, +, -, blank)
- Calibration history includes the last 10 calibrations, including buffers used, mV values, etc.

Description	Type	Temp. (°C)	Material	Connection	ØxL (mm)	Pk	Cat. No.
pHenomenal® OPOX 11-3 optical oxygen probe with built-in temperature sensor	pHenomenal® OPOX 11-3	0...+50	Epoxy	8-pin, 1,5 m cable	15,3x140	1	664-0182

Description	Pk	Cat. No.
Accessories		
Replacement cap for optical oxygen probe OPOX 11-3	1	664-0183



662-1156



662-1157



662-1159

pH ELECTRODE, PHENOMENAL®

pH electrodes with BNC connector and cable.

These electrodes are checked at five points during the manufacturing process and then lot stamped to ensure quality. Every electrode is supplied with a soaker storage bottle and cap to ensure the pH-sensitive glass and reference junction remain in top condition and are instantly ready for use.

* Integrated temperature probe

Type	Material	Electrolyte	Diaphr.	Ø×L (mm)	Connection	Pk	Cat. No.
pHenomenal® 110, gel	Epoxy	Gel	Ceramic	12×120	BNC, 1 m cable	1	662-1156
pHenomenal® 111, 3 in 1, gel *	Epoxy	Gel	Ceramic	12×120	BNC, 1 m cable	1	662-1157
pHenomenal® 111-3, 3 in 1, gel *	Epoxy	Gel	Ceramic	12×120	BNC, 3 m cable	1	662-1158
pHenomenal® 220, refillable	Glass	Refillable	Ceramic	12×120	BNC, 1 m cable	1	662-1159
pHenomenal® 221, refillable *	Glass	Refillable	Ceramic	12×120	BNC, 1 m cable	1	662-1161
pHenomenal® 211, refillable *	Epoxy	Refillable	Ceramic	12×120	BNC, 1 m cable	1	662-1162
pHenomenal® MIC 220, refillable, Micro	Glass	Refillable	Ceramic	6/12×120	BNC, 1 m cable	1	662-1163
pHenomenal® SPEAR 220, spear type	Glass	Gel	Ceramic	6/12×120	BNC, 1 m cable	1	662-1164
pHenomenal® LS 221 (Tris) *	Glass	KCl 3 mol/L, refillable	Platinum	12×120	BNC, 1 m cable	1	662-1247

Type	Material	Connection	Pk	Cat. No.
Temperature sensor pHenomenal® TEMP21				
pHenomenal® TEMP21	Epoxy	4 mm banana, 1 m cable	1	620-1659

**REDOX ELECTRODE, PHENOMENAL®**

Redox electrode with BNC connector and cable.

Type	Material	Connection	Pk	Cat. No.
pHenomenal® ORP220, refillable	Glass	BNC, 1 m cable	1	662-1165



663-0147

CONDUCTIVITY CELL, PHENOMENAL®

Description	Type	Conductivity (mS/cm)	Cell constant	Temp. (°C)	Material	Ø×L (mm)	Connection	Pk	Cat. No.
pHenomenal® CO11, 2-pole graphite, integrated NTC 30	pHenomenal® CO11	10 µS/cm - 20	0,84 cm ⁻¹	0...+80	Epoxy	15,3×120	8 pin, 1,5 m cable	1	663-0147

DISSOLVED OXYGEN PROBE, PHENOMENAL®

Description	Type	Material	Connection	Pk	Cat. No.
pHenomenal® OXY11-3, galvanic (resolution 0,1 mg/L) probe	pHenomenal® OXY11-3, galvanic	Epoxy	3 m cable, 8-pin	1	664-0042



Electrodes with different connections



Cable with BNC connector

UNIVERSAL pH ELECTRODES

Laboratory and field electrodes for general applications. Supplied with a fixed cable or plug head, VWR electrodes can be connected to most pH meters on the market.

- Comfortable handling
- Reliable, rapid readings
- Gel or liquid electrolyte, glass or epoxy body shaft
- Available with different connections: Plug head or fixed cable (1 metre) with either DIN or BNC type plug

All VWR electrodes are checked at two points during the manufacturing process and then lot stamped to ensure quality. They are supplied with a soaker storage bottle and cap to make sure the pH-sensitive glass and reference junction remain in top condition, and are instantly ready for use.

Type	Application
SJ 113 / SJ 114 / SJ 115	General purpose, education
DJ 113 / DJ 114 / DJ 115	Harsh environment, rugged use, field or plant; water, wastewater
SF 113 / SF 114 / SF 115 / SF 223 / SF 224 / SF 225 (flat)	Flat surface - cheese, meat, agar/paper
SM 123 / SM 124 / SM 125 (semi-micro)	Small sample size - Tris buffers, proteins, enzymes; semi-solids - fruit, meat, cheese, jam
SJ 223 / SJ 224 / SJ 225	General purpose; Tris buffers, proteins, enzymes
SM 223 / SM 224 / SM 225 (semi-micro)	Small sample size - Tris buffers, proteins, enzymes/test tubes, small flasks and beakers; semi-solids - fruit, meat, cheese, jam
SP 223 / SP 224 / SP 225 (spear)	Semi-solids - fruit, meat, cheese, jam; small sample size - Tris buffers, proteins, enzymes/test tubes, small flasks and beakers

Description	Type	Material	Electrolyte	Diaphr.	Ø×L (mm)	Connection	Pk	Cat. No.
Single junction	SJ 113	Epoxy	Gel	Ceramic	12×120	1 m cable with BNC connector	1	662-1382
Single junction	SJ 114	Epoxy	Gel	Ceramic	12×120	1 m cable with DIN connector	1	662-1383
Single junction	SJ 115	Epoxy	Gel	Ceramic	12×120	Plug head (S7)	1	662-1384
Single junction	SJ 223	Glass	KCl 3 mol/L	Ceramic	12×120	1 m cable with BNC connector	1	662-1395
Single junction	SJ 224	Glass	KCl 3 mol/L	Ceramic	12×120	1 m cable with DIN connector	1	662-1396
Single junction	SJ 225	Glass	KCl 3 mol/L	Ceramic	12×120	Plug head (S7)	1	662-1397
Double junction	DJ 113	Epoxy	Gel	Ceramic	12×120	1 m cable with BNC connector	1	662-1385
Double junction	DJ 114	Epoxy	Gel	Ceramic	12×120	1 m cable with DIN connector	1	662-1386
Double junction	DJ 115	Epoxy	Gel	Ceramic	12×120	Plug head (S7)	1	662-1387
Single junction	SM 123 (semi-micro)	Glass	Gel	Ceramic	12/6×120	1 m cable with BNC connector	1	662-1391
Single junction	SM 124 (semi-micro)	Glass	Gel	Ceramic	12/6×120	1 m cable with DIN connector	1	662-1392
Single junction	SM 125 (semi-micro)	Glass	Gel	Ceramic	12/6×120	Plug head (S7)	1	662-1393
Single junction	SM 223 (semi-micro)	Glass	KCl 3 mol/L	Ceramic	12/6×120	1 m cable with BNC connector	1	662-1402
Single junction	SM 224 (semi-micro)	Glass	KCl 3 mol/L	Ceramic	12/6×120	1 m cable with DIN connector	1	662-1403
Single junction	SM 225 (semi-micro)	Glass	KCl 3 mol/L	Ceramic	12/6×120	Plug head (S7)	1	662-1404
Single junction	SP 223 (spear)	Glass	KCl 3 mol/L	Ceramic	12/6×120	1 m cable with BNC connector	1	662-1405
Single junction	SP 224 (spear)	Glass	KCl 3 mol/L	Ceramic	12/6×120	1 m cable with DIN connector	1	662-1406
Single junction	SP 225 (spear)	Glass	KCl 3 mol/L	Ceramic	12/6×120	Plug head (S7)	1	662-1407
Single junction	SF 113 (flat)	Epoxy	Gel	Ceramic	12×120	1 m cable with BNC connector	1	662-1388
Single junction	SF 114 (flat)	Epoxy	Gel	Ceramic	12×120	1 m cable with DIN connector	1	662-1389
Single junction	SF 115 (flat)	Epoxy	Gel	Ceramic	12×120	Plug head (S7)	1	662-1390
Single junction	SF 223 (flat)	Glass	KCl 3 mol/L	Ceramic	12×120	1 m cable with BNC connector	1	662-1398
Single junction	SF 224 (flat)	Glass	KCl 3 mol/L	Ceramic	12×120	1 m cable with DIN connector	1	662-1399
Single junction	SF 225 (flat)	Glass	KCl 3 mol/L	Ceramic	12×120	Plug head (S7)	1	662-1401

Description	Pk	Cat. No.
Cables for electrodes		
BNC connector, 1 m cable, coaxial, Coax53	1	662-1410
DIN connector, 1 m cable, coaxial, Coax54	1	662-1411
Radiometer connector, 1 m cable, coaxial, Coax56	1	662-1412
Lemo (metrohm) connector, 1 m cable, coaxial, Coax57	1	662-1413



SPECIALITY pH ELECTRODES

pH electrodes with 1 m fixed cable or S7 connector.

- Checked at five points during the manufacturing process and lot stamped to ensure quality
- Storage soaker bottle to protect the electrode, keeping the item in top condition and instantly ready for use

pH range: 0 to 14

Temperature range: 0 to +100 °C (10 to 100 °C for flat tips)

Response time: 95% <1 second (95% <5 seconds for flat tips)

Electrode	Applications
Simple junction / ceramic junction	Aqueous media
Double junction	Aqueous media, microbiology samples, beer
Flat tip, double junction	Agar, food and beverage, serum, soil, Tris buffers, viscous samples
Semi-micro	Tap water, seawater, disinfectants, soap
Large surface flat tip	Agar, food, cosmetics, leather, water, viscous samples
Large surface flat tip, fluoride resistant bulb	Low flow cells, Agar plates, electrophoresis plates
Spear tip, double junction	Bread, butter, cheese, fats, meat
Thin, ceramic / Pellon junction	Tap water, seawater, disinfectants, soap, toothpaste

Type	Temp. (°C)	Material	Electrolyte	Ø×L (mm)	Connection	Pk	Cat. No.
With 1 m fixed cable							
Thin, ceramic junction	0...100	Glass	3,5 M KCl	9,5×300	BNC	1	662-1793
Thin, Pellon junction	0...100	Epoxy	Gel	9×300	BNC	1	662-1765
Semi-micro, ceramic junction	0...100	Glass	3,5 M KCl	6×150	BNC	1	662-1794
Semi-micro, Pellon junction	0...100	Epoxy	Gel	6×150	BNC	1	662-1767
Semi-micro, Pellon junction	0...100	Epoxy	Gel	6×150	DIN	1	662-1768
Large surface flat tip, HDPE junction	0...100	Epoxy	Gel	15×115	BNC	1	662-1769
Large surface flat tip, HDPE junction	0...100	Epoxy	Gel	15×115	DIN	1	662-1770
Flat tip, double junction (HDPE/Pellon)	10...100	Epoxy	Gel	12×150	BNC	1	662-1763
Flat tip, double junction (HDPE/Pellon)	10...100	Glass	3,5 M KCl	12×150	BNC	1	662-1797
Flat tip, double junction (HDPE/Pellon)	0...100	Epoxy	Gel	12×150	DIN	1	662-1764
Spear tip, double junction (PVDF/Pellon)	0...100	Epoxy	Gel	12/9×150	BNC	1	662-0084
Spear tip, double junction (PVDF/Pellon)	0...100	Epoxy	Gel	12/9×150	DIN	1	662-0085
With S7 connector							
Thin, Pellon junction	0...100	Epoxy	Gel	9×300	S7	1	662-1774

Description	Pk	Cat. No.
Low flow cells for pH measurement		
Low flow cell 200 µl, acrylic	1	662-0457
Cables for electrodes		
BNC connector, 1 m cable, coaxial, Coax53	1	662-1410
DIN connector, 1 m cable, coaxial, Coax54	1	662-1411



REDOX ELECTRODES

Type	Material	Electrolyte	Ø×L (mm)	Connection	Pk	Cat. No.
RD 113 (redox)	Epoxy	Gel	12×120	BNC, 1 m cable	1	662-1408
RD 223 (redox)	Glass	Gel	12×120	BNC, 1 m cable	1	662-1409



CABLES FOR ELECTRODES

Description	Pk	Cat. No.
BNC connector, 1 m cable, coaxial, Coax53	1	662-1410
DIN connector, 1 m cable, coaxial, Coax54	1	662-1411
Radiometer connector, 1 m cable, coaxial, Coax56	1	662-1412
Lemo (metrohm) connector, 1 m cable, coaxial, Coax57	1	662-1413



ELECTRODE STAND

Grey iron stand for two electrodes.

- Sturdy painted cast iron stand, provides a firm footing
- Stainless steel support rod
- Acrylic electrode holder fitted using knurling screws



Description	For	Pk	Cat. No.
Electrode stand, h-shaped	2 electrodes	1	241-0114

ELECTRODE STAND, PHENOMENAL®

Electrode arm moves smoothly in almost any direction, holding up to four electrodes plus one temperature sensor safely and securely in selected positions. Fingertip control raises, lowers, and pivots the holder. The arm articulates at three points while maintaining electrodes in a vertical position.

- Ideal for multiple readings
- Accepts all standard electrodes
- Pivots 360°, extends 53 cm

Description	Pk	Cat. No.
pHenomenal® electrode stand, holds up to 4 electrodes + 1 temperature sensor	1	662-1169

ELECTRODE CLEANING SOLUTIONS

For full information concerning health and safety data please see the www.vwr.com website.

Description	Pk	Cat. No.
Electrode cleaning solution pepsin/hydrochloric acid for removal of proteins	100 ml	83603.180

CONDUCTIVITY STANDARDS AT 25 °C, POTASSIUM CHLORIDE SOLUTIONS

Description	Conductivity (mS/cm)	Pack type	Pk	Cat. No.
KCl 0,01 mol/L	1,41	Plastic bottle	100 ml	83607.180
KCl 0,1 mol/L	12,88	Plastic bottle	500 ml	83608.260

POTASSIUM CHLORIDE ELECTROLYTIC SOLUTIONS, AVS TITRINORM®

Potassium chloride 3M solution may also be used as an electrode storage solution.

For full information concerning health and safety data please see the SDS on the www.vwr.com website.

Description	Pk	Cat. No.
Potassium chloride 3 mol/L (3 N) in aqueous solution AVS TITRINORM	100 ml	83605.180
Potassium chloride 3 mol/L (3 N) in aqueous solution AVS TITRINORM	500 ml	83605.260
Potassium chloride 3 mol/L (3 N) in aqueous solution AVS TITRINORM	1 L	83605.290
Potassium chloride saturated with silver chloride aqueous solution 3 mol/L (3 N) in aqueous solution AVS TITRINORM for filling electrodes	500 ml	83606.260
Potassium chloride saturated with silver chloride aqueous solution 3 mol/L (3 N) in aqueous solution AVS TITRINORM for filling electrodes	1 L	83606.290

pH ELECTRODE MAINTENANCE KIT

Description	pH value	Colour	Pack type	Pk	Cat. No.
Buffers, electrolyte and cleaning solutions (100 ml)	4,00/7,00/10,00	Colourless	Plastic bottle	1 SET	83609.600

Avantor Services



Equipment and instrument services

Avantor Services helps you simplify equipment and instrument services, in and around the laboratory.

Our team specialises in providing a quick and targeted response to your needs. We also offer consultative and customised solutions. This enables you to:

- Improve efficiency by keeping your equipment in compliance
- Optimise your budget and maximise your equipment investment

With our network of ISO 9001 / IEC17025 accredited service providers, we can be your single point of contact for all equipment and instrument service needs.

We are focused on helping you in the following areas:

- Calibration
- Qualification and validation
- Preventive maintenance
- Certification
- Temperature mapping
- Warranty management

Visit vwr.com/avantorservices for more information.



Conductivity standards, certified reference materials

CONDUCTIVITY STANDARDS, CERTIFIED REFERENCE MATERIALS (CRMS) FOR PRIMARY CALIBRATION OF CONDUCTIVITY METERS

VWR offers a comprehensive line of conductivity standards as certified reference materials with primary use for the calibration of conductivity meters.

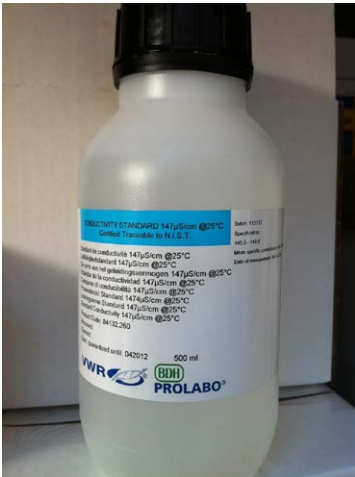
- Accredited acc. ISO 17025 / ISO 7034
- Traceable to NIST
- Certificate of Analysis including temperature correction chart

Intended uses

- Calibration, qualification and monitoring of instruments for conductivity measurement
- Validation of analytical methods
- Preparation of working reference samples
- Detection limit and linearity studies

These standards are produced by dissolving potassium chloride (KCl) in 18 MOhm deionised water, except where indicated then filtered through a 0,22 um filter in equilibrium with atmospheric carbon dioxide. The certified value and expanded uncertainty are obtained using conductivity meter calibration according to ISO/IEC 17025. Homogeneity and stability studies are performed according to the requirement of ISO 17034 and ISO Guide 35. All conductivity standards are traceable to SI (NIST).

Description	Conductivity	Pack type	Pk	Cat. No.
Conductivity standard CRM	0 - 2 µS/cm (nominal)	Plastic bottle	250 ml	89001.270
Conductivity standard CRM	5	Plastic bottle	500 ml	89002.270
Conductivity standard CRM	10	Plastic bottle	500 ml	89003.270
Conductivity standard CRM	15	Plastic bottle	500 ml	89005.270
Conductivity standard CRM	20	Plastic bottle	500 ml	89006.270
Conductivity standard CRM	25	Plastic bottle	500 ml	89007.270
Conductivity standard CRM	50	Plastic bottle	500 ml	89008.270
Conductivity standard CRM	84	Plastic bottle	500 ml	89009.270
Conductivity standard CRM	100	Plastic bottle	500 ml	89010.270
Conductivity standard CRM	147	Plastic bottle	500 ml	89011.270
Conductivity standard CRM	200	Plastic bottle	500 ml	89012.270
Conductivity standard CRM	500	Plastic bottle	500 ml	89013.270
Conductivity standard CRM	718	Plastic bottle	500 ml	89014.270
Conductivity standard CRM	1000	Plastic bottle	500 ml	89015.270
Conductivity standard CRM	1413	Plastic bottle	500 ml	89018.270
Conductivity standard CRM	1500	Plastic bottle	500 ml	89019.270
Conductivity standard CRM	2000	Plastic bottle	500 ml	89020.270
Conductivity standard CRM	3000	Plastic bottle	500 ml	89021.270
Conductivity standard CRM	10000	Plastic bottle	500 ml	89023.270
Conductivity standard CRM	12880	Plastic bottle	500 ml	89025.270
Conductivity standard CRM	15000	Plastic bottle	500 ml	89026.270
Conductivity standard CRM	20000	Plastic bottle	500 ml	89027.270
Conductivity standard CRM	30000	Plastic bottle	500 ml	89028.270
Conductivity standard CRM	50000	Plastic bottle	500 ml	89029.270
Conductivity standard CRM	100000	Plastic bottle	500 ml	89030.270
Conductivity standard CRM	111.3	Plastic bottle	500 ml	89031.270



Conductivity standard solutions

CONDUCTIVITY STANDARD SOLUTIONS

A complete range of certified control standards with values ranging from 1,3 to 500000 µS to meet all the requirements for electrochemical analysis.

- Accurate to ±1%
- Traceable to NIST, meeting Ph. Eur. and USP requirements
- Tested using INAB accredited test methods to ISO 17025

Standard values (25 °C)

Used for determining cell constant - see recommendations of instrument manufacturer for the relevant cell design.

Premium values (25 °C)

These standards are for verifying that the measuring system (instrument, probe and operator) can accurately detect sample values in the area of interest (e.g. 20 µS/cm for low conductivity water used in the pharmaceutical sector, or 100000 µS/cm for environmental samples).

Description	Pack type	Pk	Cat. No.
Standard values (25 °C)			
Conductivity standard 84 µS/cm (25 °C)	Plastic bottle	100 ml	84131.180
Conductivity standard 84 µS/cm (25 °C)	Plastic bottle	500 ml	84131.260
Conductivity standard 147 µS/cm (25 °C)	Plastic bottle	500 ml	84132.260
Conductivity standard 1413 µS/cm (25 °C)	Plastic bottle	100 ml	84135.180
Conductivity standard 1413 µS/cm (25 °C)	Plastic bottle	500 ml	84135.260
Conductivity standard 1413 µS/cm (25 °C)	Plastic bottle	1 L	84135.290
Conductivity standard 12880 µS/cm (25 °C)	Plastic bottle	100 ml	84136.180
Conductivity standard 12880 µS/cm (25 °C)	Plastic bottle	500 ml	84136.260
Conductivity standard 12880 µS/cm (25 °C)	Plastic bottle	1 L	84136.290
Premium values (25 °C)			
Premium conductivity standard 20 µS/cm	Plastic bottle	500 ml	84140.260
Premium conductivity standard 50 µS/cm	Plastic bottle	500 ml	84143.260
Premium conductivity standard 100 µS/cm	Plastic bottle	500 ml	84139.260
Premium conductivity standard 200 µS/cm	Plastic bottle	500 ml	84145.260
Premium conductivity standard 500 µS/cm	Plastic bottle	500 ml	84138.260
Premium conductivity standard 1000 µS/cm	Plastic bottle	500 ml	84141.260
Premium conductivity standard 10000 µS/cm	Plastic bottle	500 ml	84146.260
Premium conductivity standard 50000 µS/cm	Plastic bottle	500 ml	84142.260
Premium conductivity standard 100000 µS/cm	Plastic bottle	500 ml	84144.260
Premium conductivity standard 111800 µS/cm	Plastic bottle	500 ml	84108.260
Premium conductivity standard 150000 µS/cm	Plastic bottle	500 ml	85917.260
Premium conductivity standard 200000 µS/cm	Plastic bottle	500 ml	85918.260
Premium conductivity standard 500000 µS/cm	Plastic bottle	500 ml	85919.260



pH BUFFER SOLUTIONS IN SACHETS, 20 °C, AVS TITRINORM

For calibration of pH meters.

- Practical colour coded 30 ml sachets - single use per sachet - no risk of contamination
- Ideal for on-site analyses
- Accuracy: pH is $\pm 0,02$ at 20 °C
- Traceable to SRM from NIST

pH value	pH buffer type	Colour	Packed	Pk	Cat. No.
4,00	Phthalate	Colourless	30×30 ml sachets per kit	1 KIT	85041.001
7,00	Phosphate	Colourless	30×30 ml sachets per kit	1 KIT	85042.001
9,00	Borate	Colourless	30×30 ml sachets per kit	1 KIT	85043.001
10,00	Borate	Colourless	30×30 ml sachets per kit	1 KIT	85044.001

pH value	Colour	Packed	Pk	Cat. No.
Assorted buffer kits				
4,00/7,00/9,00	Colourless	10×30 ml sachets of pH 4,01; 10×30 ml sachets of pH 7,00; 10×30 ml sachets of pH 9,00	1 KIT	85045.001
4,00/7,00/10,00	Colourless	10×30 ml sachets of pH 4,01; 10×30 ml sachets of pH 7,00; 10×30 ml sachets of pH 10,00	1 KIT	85046.001



BUFFER SOLUTIONS, 25 °C AVS TITRINORM

- Certified Reference Materials (CRMs) according to ISO 17034
- Solutions prepared from AnalaR® NORMAPUR® grade analytical reagents
- True analytical value on the label to an accuracy of $\pm 0,02$ pH units
- Traceable to SRM from NIST
- Batch number and packing date for traceability

Certificates of Analysis available at vwr.com

pH value	pH buffer type	Colour	Pack type	Pk	Cat. No.
1,68	Oxalate	Colourless	Plastic bottle	500 ml	85506.260
4,01	Phthalate	Colourless	Plastic bottle	500 ml	85511.260
6,87	Phosphate	Colourless	Plastic bottle	500 ml	85515.260
7,41	Phosphate	Colourless	Plastic bottle	500 ml	85516.260
9,18	Borate	Colourless	Plastic bottle	500 ml	85517.260
10,01	Carbonate	Colourless	Plastic bottle	500 ml	85518.260



Buffer solutions, secondary standards

BUFFER SOLUTIONS, SECONDARY STANDARDS VWR CHEMICALS

- Accurate to $\pm 0,010$ pH units (except buffer 12,454 with accuracy $\pm 0,050$)
- Solution standardised at 25 °C
- Fully traceable for optimum pH calibration (traceable to NIST, DIN 19266 and IUPAC)
- Temperature dependence data is printed on the labels as are batch number and expiry date

pH value	pH accuracy	Pack type	Pk	Cat. No.
1,679	$\pm 0,010$	Plastic bottle	500 ml	84580.260
4,005	$\pm 0,010$	Plastic bottle	500 ml	84582.260
6,865	$\pm 0,010$	Plastic bottle	500 ml	84583.260
7,413	$\pm 0,010$	Plastic bottle	500 ml	84584.260
9,180	$\pm 0,010$	Plastic bottle	500 ml	84585.260
10,012	$\pm 0,010$	Plastic bottle	500 ml	84586.260
12,454	$\pm 0,050$	Plastic bottle	500 ml	84587.260



BUFFER SOLUTIONS, 20 °C AVS TITRINORM

- Solutions prepared from AnalAR® NORMAPUR® grade analytical reagents
- Reference temperature 20 °C
- True analytical value on the label to an accuracy of $\pm 0,02$ pH units (pH 1,00 to 11,00); $\pm 0,05$ for pH 12,00 buffer
- Traceable to SRM from NIST
- Batch number and packing date for traceability
- Certificate of Analysis available at vwr.com

If significantly large volumes are required please contact your local Avantor sales office for a customised offer.

pH value	pH accuracy	Accreditation	pH buffer type	Colour	Pack type	Pk	Cat. No.
Buffer solutions in bottles							
1,00	$\pm 0,02$	-	Glycine	Colourless	Plastic bottle	1 L	32031.297
2,00	$\pm 0,02$	ISO 17034	Citrate	Colourless	Plastic bottle	500 ml	32032.260
2,00	$\pm 0,02$	ISO 17034	Citrate	Colourless	Plastic bottle	1 L	32032.291
3,00	$\pm 0,02$	ISO 17034	Citrate	Colourless	Plastic bottle	1 L	32033.294
3,00	$\pm 0,02$	ISO 17034	Citrate	Colourless	Bag-in-box (Cubitainer)	5 L	32033.374
4,00	$\pm 0,02$	ISO 17034	Phthalate	Colourless	Plastic bottle	100 ml	32095.184
4,00	$\pm 0,02$	ISO 17034	Phthalate	Colourless	Plastic bottle	500 ml	32095.264
4,00	$\pm 0,02$	ISO 17034	Phthalate	Colourless	Plastic bottle	1 L	32095.297
4,00	$\pm 0,02$	ISO 17034	Phthalate	Colourless	Plastic bottle	5 L	32095.366
4,00	$\pm 0,02$	ISO 17034	Phthalate	Red	Plastic bottle	500 ml	32044.268
4,00	$\pm 0,02$	ISO 17034	Phthalate	Red	Dosing bottle (plastic)	1 L	32044.290
4,00	$\pm 0,02$	ISO 17034	Phthalate	Red	Plastic bottle	1 L	32044.292
4,66	$\pm 0,02$	ISO 17034	Acetate	Colourless	Plastic bottle	500 ml	98192.260
4,66	$\pm 0,02$	ISO 17034	Acetate	Colourless	Plastic bottle	1 L	98192.290
5,00	$\pm 0,02$	ISO 17034	Citrate	Colourless	Plastic bottle	1 L	32035.291
6,00	$\pm 0,02$	ISO 17034	Citrate	Colourless	Plastic bottle	1 L	32036.294
6,88	$\pm 0,02$	ISO 17034	Phosphate	Colourless	Plastic bottle	500 ml	83601.260
6,88	$\pm 0,02$	ISO 17034	Phosphate	Colourless	Plastic bottle	1 L	83601.290
7,00	$\pm 0,02$	ISO 17034	Phosphate	Colourless	Plastic bottle	100 ml	32096.187
7,00	$\pm 0,02$	ISO 17034	Phosphate	Colourless	Plastic bottle	500 ml	32096.267
7,00	$\pm 0,02$	ISO 17034	Phosphate	Colourless	Plastic bottle	1 L	32096.291
7,00	$\pm 0,02$	ISO 17034	Phosphate	Colourless	Plastic bottle	5 L	32096.360
7,00	$\pm 0,02$	ISO 17034	Phosphate	Colourless	Bag-in-box (cubitainer)	10 L	32096.400
7,00	$\pm 0,02$	ISO 17034	Phosphate	Green	Plastic bottle	500 ml	32045.262
7,00	$\pm 0,02$	ISO 17034	Phosphate	Green	Dosing bottle (plastic)	1 L	32045.290
7,00	$\pm 0,02$	ISO 17034	Phosphate	Green	Plastic bottle	1 L	32045.295
7,00	$\pm 0,02$	ISO 17034	Phosphate	Green	Bag-in-box (cubitainer)	5 L	32045.375
8,00	$\pm 0,02$	ISO 17034	Borate	Colourless	Plastic bottle	1 L	32038.291
9,00	$\pm 0,02$	ISO 17034	Borate	Colourless	Plastic bottle	500 ml	32039.261
9,00	$\pm 0,02$	ISO 17034	Borate	Colourless	Plastic bottle	1 L	32039.294
9,00	$\pm 0,02$	ISO 17034	Borate	Blue	Plastic bottle	500 ml	32046.265
9,00	$\pm 0,02$	ISO 17034	Borate	Blue	Plastic bottle	1 L	32046.298
9,00	$\pm 0,02$	ISO 17034	Borate	Blue	Bag-in-box (cubitainer)	5 L	32046.378
9,22	$\pm 0,02$	ISO 17034	Borate	Colourless	Plastic bottle	500 ml	32097.261
9,22	$\pm 0,02$	ISO 17034	Borate	Colourless	Plastic bottle	1 L	32097.290
10,00	$\pm 0,02$	ISO 17034	Carbonate	Colourless	Plastic bottle	100 ml	32040.185
10,00	$\pm 0,02$	ISO 17034	Carbonate	Colourless	Plastic bottle	500 ml	32040.260
10,00	$\pm 0,02$	ISO 17034	Carbonate	Colourless	Plastic bottle	1 L	32040.298
10,00	$\pm 0,05$	-	Ammonia	Colourless	Plastic bottle	500 ml	98213.260
10,00	$\pm 0,02$	ISO 17034	Borate	Yellow	Plastic bottle	500 ml	85680.260
10,00	$\pm 0,02$	ISO 17034	Borate	Yellow	Dosing bottle (plastic)	1 L	85680.290
10,00	$\pm 0,02$	ISO 17034	Borate	Yellow	Plastic bottle	1 L	85680.295
11,00	$\pm 0,02$	-	Phosphate	Colourless	Plastic bottle	1 L	32041.292
12,00	$\pm 0,05$	-	Phosphate	Colourless	Plastic bottle	1 L	32042.295
Buffer solution sets							
10,00/7,00/4,00	$\pm 0,02$	ISO 17034		Blue/green/red	Plastic bottle (3x100 ml)	1	83610.600
10,00/7,00/4,00	$\pm 0,02$	ISO 17034		Blue/green/red	Plastic bottle (3x250 ml)	1	83610.610



85406.600

pH INDICATOR PAPERS, DUO, ROTA

Duo indicator papers show two different colours for each pH value.

- Easy to use for qualitatively accurate readings
- Produced from high quality paper to give good colour matching of paper to printed calibration scale
- Narrow range papers with graduation intervals of 0,3 pH units on the colour scale
- Wide range papers with graduation intervals up to 1 pH unit on the colour scale

Supplied in plastic reels that ensure protection and long-term stability. Reel of 5 m length, width: 10 mm

pH range	pH gradation	Pk	Cat. No.
1,0 - 12,0	1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 · 11 · 12	5	85403.600
1,0 - 4,3	1,0 · 1,3 · 1,6 · 1,9 · 2,2 · 2,5 · 2,8 · 3,1 · 3,4 · 4,0 · 4,3	5	85404.600
3,5 - 6,8	3,5 · 3,8 · 4,1 · 4,4 · 4,7 · 5,0 · 5,3 · 5,6 · 5,9 · 6,2 · 6,5 · 6,8	5	85405.600
5,0 - 8,0	5,0 · 5,3 · 5,6 · 5,9 · 6,2 · 6,5 · 6,8 · 7,1 · 7,4 · 7,7 · 8,0	5	85406.600
7,0 - 10,0	7,0 · 7,3 · 7,6 · 7,9 · 8,2 · 8,5 · 8,8 · 9,1 · 9,4 · 9,7 · 10,0	5	85407.600
9,5 - 14,0	9,5 · 10,0 · 10,5 · 11,0 · 11,5 · 12,0 · 12,5 · 13,0 · 13,5 · 14,0	5	85408.600



85424.602

pH INDICATOR STRIPS FOR COLOURED SAMPLES, DOSATEST

Dosatest strips incorporate the colour scale and are ideal for determining pH values for coloured solutions.

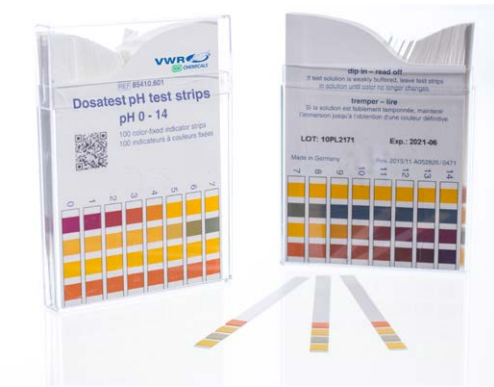
- Reliable even in coloured samples
- Versatile and economic
- Handle remains dry and clean whatever the sample

Due to the scale in the strip, any sample colour will have the same effect on the reference colour as on the reactive strip ensuring accurate readings even in coloured samples.

Invisible hydrophobic barrier above the top colour field on the strip stops capillary action of the test solution and prevents contact with the user.

Box with 200 test strips 6×95 mm

pH range	pH gradation	Pk	Cat. No.
0 - 12	1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 · 11 · 12	200	85424.602
0 - 1,8	0 · 0,3 · 0,6 · 0,8 · 1,0 · 1,2 · 1,5 · 1,8	200	85425.602
1,8 - 3,8	1,8 · 2,1 · 2,4 · 2,7 · 3,0 · 3,2 · 3,5 · 3,8	200	85426.602
3,8 - 5,5	3,8 · 4,0 · 4,2 · 4,4 · 4,6 · 4,9 · 5,2 · 5,5	200	85427.602
5,2 - 6,8	5,2 · 5,5 · 5,7 · 5,9 · 6,1 · 6,3 · 6,5 · 6,8	200	85428.602
6,0 - 8,1	6,0 · 6,3 · 6,6 · 6,9 · 7,2 · 7,5 · 7,8 · 8,1	200	85429.602
8,0 - 9,7	8,0 · 8,2 · 8,4 · 8,6 · 8,8 · 9,1 · 9,4 · 9,7	200	85430.602
9,5 - 12,0	9,5 · 10,0 · 10,5 · 11,0 · 11,5 · 12,0	200	85431.602
12 - 14	12,0 · 12,5 · 13,0 · 13,5 · 14,0	200	85432.602



85410.601

pH INDICATOR TEST STRIPS, NON BLEEDING, DOSATEST

Dosatest test strips provide precise and rapid pH determination, with up to four different colour blocks for each pH value.

- Easier to work with due to the long handle
- Colour-fixed reactive pads
- Brilliant colour chart

pH indicator is chemically bound onto the cellulose fibre preventing bleeding. This effectively protects the sample against contamination and enables measurements to be taken even in weakly buffered or strongly alkaline solutions.

Better access to different types of containers and prevents fingers getting into contact with the sample.

Supplied as a box with 100 test strips 6×85 mm.

pH range	pH gradation	Pk	Cat. No.
0,0 - 14,0	0 · 1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 · 11 · 12 · 13 · 14	100	85410.601
0,0 - 6,0	0 · 0,5 · 1 · 1,5 · 2 · 2,5 · 3 · 3,5 · 4 · 4,5 · 5 · 5,5 · 6,0	100	85411.601
0,3 - 2,3	0,3 · 0,7 · 1,0 · 1,3 · 1,6 · 1,9 · 2,3	100	85421.601
1,7 - 3,8	1,7 · 2,0 · 2,3 · 2,6 · 2,9 · 3,2 · 3,5 · 3,8	100	85422.601
2,0 - 9,0	2,0 · 2,5 · 3,0 · 3,5 · 4,0 · 4,5 · 5,0 · 5,5 · 6,0 · 6,5 · 7,0 · 7,5 · 8,0 · 8,5 · 9,0	100	85412.601
3,6 - 6,1	3,6 · 4,1 · 4,4 · 4,7 · 5,0 · 5,3 · 5,6 · 6,1	100	85416.601
4,0 - 7,0	4,0 · 4,4 · 4,7 · 5,0 · 5,3 · 5,5 · 5,8 · 6,1 · 6,5 · 7,0	100	85423.601
4,5 - 10,0	4,5 · 5,0 · 5,5 · 6,0 · 6,5 · 7,0 · 7,5 · 8,0 · 8,5 · 9,0 · 9,5 · 10,0	100	85413.601
5,1 - 7,2	5,1 · 5,4 · 5,7 · 6,0 · 6,3 · 6,6 · 6,9 · 7,2	100	85417.601
6,0 - 7,7	6,0 · 6,4 · 6,7 · 7,0 · 7,3 · 7,7	100	85418.601
6,0 - 10,0	6,0 · 6,4 · 6,7 · 7,0 · 7,3 · 7,6 · 7,9 · 8,2 · 8,4 · 8,6 · 8,8 · 9,1 · 9,5 · 10,0	100	85414.601
7,0 - 14,0	7,0 · 7,5 · 8,0 · 8,5 · 9,0 · 9,5 · 10,0 · 10,5 · 11,0 · 11,5 · 12,0 · 12,5 · 13,0 · 13,5 · 14,0	100	85415.601
7,5 - 9,5	7,5 · 7,9 · 8,2 · 8,4 · 8,6 · 8,8 · 9,1 · 9,5	100	85419.601
7,9 - 9,8	7,9 · 8,3 · 8,6 · 8,9 · 9,1 · 9,4 · 9,8	100	85420.601

INDICATOR STRIPS, NON BLEEDING

Non bleeding special indicator dyes that are covalently bound onto the reagent paper and then adhered to plastic strips.

Description	pH range	Pk	Cat. No.
Indicator strips, non bleeding	0 - 14	100	315082P

VWR Chemicals volumetric solutions for titration

All you need for titration.

- AVS TITRINORM: 'Ready to use' volumetric solutions, traceable to NIST available in different packs
- Convol NORMADOSE: Concentrated volumetric solutions
- Secondary reference standards for reliable calibration in volumetric analysis



DISCOVER MORE

Titration

From simple manual burettes, to the most complicated automatic instruments, Avantor can help you find the right configuration and brand for your application.

Visit our website to find all you need to know about titration, some theory and practice, but also a broad selection of instruments.



DIGITAL BURETTE, DIGITRATE PRO™

Digitrate Pro™ combines modern design, with precise, accurate and convenient dispensing. Its head can be conveniently rotated 360° for operator safety and comfort, whilst the see-through barrel ensures bubble-free titration. The robust outer casing does not move during priming or dispensing sequences, and the PTFE plunger and borosilicate glass barrel allow dispensing of aqueous solutions and some aggressive liquids.

- Continuous display of volume dispensed with zero reset feature for multiple titrations
- Automatic switch-off when left unattended without losing the previous titration volume
- All wetted parts are chemically resistant and autoclavable at +121 °C
- Safety pedestal valve allows the burette to be turned off to prevent accidental delivery
- Visible borosilicate glass barrel, protected with a transparent PP sleeve, can be easily removed and cleaned

Digitrate Pro™ is powered by a 3,6 V lithium battery giving a minimum life of 60000 3 minute titrations. An automatic low battery indication is shown on the large easy to read LCD window. Simple user-calibration and factory reset for ISO 9000 and GLP requirements.

The Digitrate Pro™ has a standard 30 mm neck fitting. It is supplied with three bottle neck adapters (33, 38 and 45 mm), individual calibration certificate and instruction manual. They are not supplied with a reservoir, to be ordered separately.



613-5287

Volume (ml)	Division (ml)	Accuracy (%)	Imprecision (%)	Pk	Cat. No.
0 - 30	0,01	±0,2	≤0,1	1	612-3875
0 - 50	0,01	±0,2	≤0,1	1	613-5287

BULB PIPETTES, ONE MARK, CLASS AS

Borosilicate 3.3 glass.

- Calibrated to deliver (TD)
- Ring mark and inscriptions in high contrast amber stain
- Not available with individual certificate

DIN EN ISO 648

Dated batch identification and batch certificate included.



Capacity (ml)	Tolerance (± ml)	Length (mm)	Pk	Cat. No.
1	0,007	300	3	612-4129
2	0,010	330	3	612-4130
3	0,010	350	3	612-4131
4	0,015	410	3	612-4132
5	0,015	410	3	612-4133
10	0,020	450	3	612-4134
20	0,030	520	2	612-4135
25	0,030	530	2	612-4136
50	0,050	550	2	612-4137
100	0,080	600	2	612-4138



BURETTES, LATERAL STOPCOCK

Borosilicate 3.3 glass, class AS.

- Schellbach stripe, stopcock with glass key
- High contrast blue enamel graduations
- Batch certificate included

DIN EN ISO 385

Capacity (ml)	Division (ml)	Tolerance ($\pm$ ml)	Scale length (mm)	Pk	Cat. No.
10	0,05	0,02	500	1	612-4142
25	0,1	0,03	500	1	612-4143
50	0,1	0,05	500	1	612-4144



BURETTES, STRAIGHT STOPCOCK

Borosilicate 3.3 glass, class AS.

- Schellbach stripe, stopcock with glass key
- High contrast blue enamel graduations
- Batch certificate included

DIN EN ISO 385

Capacity (ml)	Division (ml)	Tolerance ($\pm$ ml)	Scale length (mm)	Pk	Cat. No.
10	0,05	0,02	500	1	612-4139
25	0,05	0,03	500	1	612-4140
50	0,1	0,05	500	1	612-4141

VOLUMETRIC SOLUTIONS, CONVO NORMADOSE

Concentrated analytical solutions that save space and cost without compromising on quality.

- Concentrated solutions in an ampoule for dilution to 1 litre
- Solutions prepared from analytical reagents
- Economical and space saving
- Final concentration can be user-specified
- Instructions for use written on the boxes
- Accuracy of 0,2%

Description	Pk	Cat. No.
EDTA disodium salt concentrate for dilution to 0,01 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	60 ml	32068.603
Hydrochloric acid concentrate for dilution to 0,1 mol/L in a queous solution, ConvoL NORMADOSE volumetric solution	60 ml	32051.605
Hydrochloric acid concentrate for dilution to 0,5 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	210 ml	84589.600
Hydrochloric acid concentrate for dilution to 1 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	160 ml	32050.602
Iodide Iodate concentrate for dilution to 1/128 mol/L (1/64 N) in aqueous solution, ConvoL NORMADOSE volumetric solution	50 ml	84103.600
Iodine concentrate for dilution to 0,05 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	30 ml	84591.600
Nitric acid concentrate for dilution to 0,1 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	60 ml	32069.606
Potassium dichromate concentrate for dilution to 1/60 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	60 ml	32061.600
Silver nitrate concentrate for dilution to 0,1 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	60 ml	32056.602
Sodium chloride concentrate for dilution to 0,1 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	60 ml	32064.600
Sodium hydroxide concentrate for dilution to 0,01 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	60 ml	84596.600
Sodium hydroxide concentrate for dilution to 0,1 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	60 ml	32067.600
Sodium hydroxide concentrate for dilution to 0,5 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	210 ml	84597.600
Sodium hydroxide concentrate for dilution to 1 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	170 ml	32066.606
Sodium thiosulphate concentrate for dilution to 0,01 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	60 ml	84598.600
Sodium thiosulphate concentrate for dilution to 0,1 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	60 ml	32065.603
Sulphuric acid concentrate for dilution to 0,01 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	6	180321X
Sulphuric acid concentrate for dilution to 0,5 mol/L in aqueous solution, ConvoL NORMADOSE volumetric solution	170 ml	32053.602

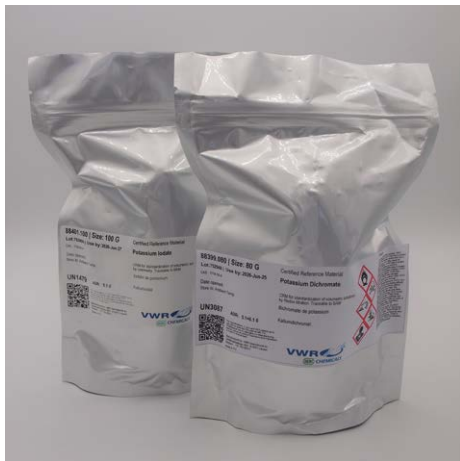
VOLUMETRIC SOLUTIONS, AVS TITRINORM

- Traceable to SRM from NIST
- No costly preparation time
- Variety of pack sizes/pack types: 250 ml up to 20 L, in bottles, bag-in-box or bulk packs
- Manufactured from analytical grade products, within an accuracy of 0,2%
- High reproducibility, labelled with minimum shelf life/batch number

Description	Pk	Cat. No.
Acetic acid 0.1 mol/L (0.1 N), AVS TITRINORM volumetric solution	1 L	300652.1000
Acetic acid 0.5 mol/L 0.5 N, AVS TITRINORM volumetric solution	1 L	85803.290
Acetic acid 1 mol/L (1 N), AVS TITRINORM volumetric solution	1 L	30010.292
Ammonium cerium(IV) sulphate 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	2678.1000
Ammonium thiocyanate 0.02 mol/L (0.02 N) in aqueous solution volumetric solution	1 L	302634.1000
Ammonium thiocyanate 0.05 mol/L (0.05 N) in aqueous solution	1 L	302635.1000
Barium chloride 20% in aqueous solution	5 L	240314.5000
Benzethonium chloride 0.004 mol/L, AVS TITRINORM volumetric solution	1 L	30497.293
Benzethonium chloride 0.004 mol/L, AVS TITRINORM volumetric solution	2,5 L	30497.327
Benzethonium chloride 0.01 N, AVS TITRINORM volumetric solution	2,5 L	89576.320
Benzethonium chloride 0.03 N, AVS TITRINORM volumetric solution	2,5 L	89577.320
Calcium chloride 1 mol/L in aqueous solution, AVS TITRINORM volumetric solution	1 L	190464K
Carrez II solution zinc acetate 1 mol/L in acetic acid solution (0,5 mol/L)	1 L	5056.1000
Carrez I solution [potassium hexacyanoferrate(II)] 0.25 mol/L in aqueous solution	1 L	85733.290
Cerium(IV) sulphate 0.05 mol/L (0.05 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31307.294
Cerium(IV) sulphate 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM Reag. Ph. Eur., Reag. USP volumetric solution	2,5 L	190475N
Cerium(IV) sulphate 0.25 mol/L (0.25 N) in 0.25 N sulphuric acid, AVS TITRINORM volumetric solution	1 L	85804.290
EDTA disodium salt 0.0178 mol/L (N/28) in water, AVS TITRINORM for hardness of water determinations	1 L	30029.290
EDTA disodium salt 0.0178 mol/L (N/28) in water, AVS TITRINORM for hardness of water determinations	5 L	30029.360
EDTA disodium salt 0.0178 mol/L (N/28) in water, AVS TITRINORM for hardness of water determinations	10 L	30029.400
EDTA disodium salt 0.01 mol/L (0.02 N) in aqueous solution, AVS TITRINORM volumetric solution	5 L	160226G
EDTA disodium salt 0.05 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30031.294
EDTA disodium salt 0.05 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	30031.408
EDTA disodium salt 0.1 mol/L (0.2 N) in aqueous solution, AVS TITRINORM for hardness of water determinations	1 L	28662.290
EDTA disodium salt 0.1 mol/L (0.2 N) in aqueous solution, AVS TITRINORM for hardness of water determinations	5 L	28662.370
EDTA disodium salt 7,444 g/l in aqueous solution, AVS TITRINORM	10 L	88826.9011
Hydrochloric acid 0.01 mol/L (0.01 N), VOLUSOL® volumetric solution	1 L	311341.1000
Hydrochloric acid 0.02 mol/L (0.02 N), AVS TITRINORM volumetric solution	1 L	98052.296
Hydrochloric acid 0.04 mol/L (0.04 N), AVS TITRINORM according to the NF T 90-036 standard, volumetric solution	1 L	30022.293
Hydrochloric acid 0.0714 mol/L (0.1N/1.4), AVS TITRINORM volumetric solution	10 L	307902.400
Hydrochloric acid 0.1 mol/L (0.1 N), AVS TITRINORM Reag. Ph. Eur. volumetric solution	1 L	31955.293
Hydrochloric acid 0.1 mol/L (0.1 N), AVS TITRINORM Reag. Ph. Eur. volumetric solution	2,5 L	31955.327
Hydrochloric acid 0.1 mol/L (0.1 N), AVS TITRINORM Reag. Ph. Eur. volumetric solution	5 L	31955.373
Hydrochloric acid 0.1 mol/L (0.1 N), AVS TITRINORM Reag. Ph. Eur. volumetric solution	10 L	31955.407
Hydrochloric acid 0.1 mol/L (0.1 N), AVS TITRINORM Reag. Ph. Eur. volumetric solution	20 L	31955.442
Hydrochloric acid 0.2 mol/L (0.2 N), AVS TITRINORM volumetric solution	1 L	31983.290
Hydrochloric acid 0.2 mol/L (0.2 N), AVS TITRINORM volumetric solution	5 L	31983.370
Hydrochloric acid 0.357 mol/L (N/2.8), AVS TITRINORM volumetric solution	1 L	30023.296
Hydrochloric acid 0.5 mol/L (0.5 N), AVS TITRINORM Reag. Ph. Eur. volumetric solution	1 L	31954.290
Hydrochloric acid 0.5 mol/L (0.5 N), AVS TITRINORM Reag. Ph. Eur. volumetric solution	5 L	31954.368
Hydrochloric acid 0.714 mol/L (N/1.4), AVS TITRINORM volumetric solution	10 L	307904.400
Hydrochloric acid 1,128% (w/v) analytical reagent	1 L	86132.290
Hydrochloric acid 1,128% (w/v) analytical reagent	5 L	86132.360
Hydrochloric acid 1 mol/L (1 N), AVS TITRINORM Reag. Ph. Eur., Reag. USP, NF volumetric solution	1 L	30024.290
Hydrochloric acid 1 mol/L (1 N), AVS TITRINORM Reag. Ph. Eur., Reag. USP, NF volumetric solution	2,5 L	30024.324
Hydrochloric acid 1 mol/L (1 N), AVS TITRINORM Reag. Ph. Eur., Reag. USP, NF volumetric solution	5 L	30024.370
Hydrochloric acid 1 mol/L (1 N), AVS TITRINORM Reag. Ph. Eur., Reag. USP, NF volumetric solution	10 L	30024.404
Hydrochloric acid 1 mol/L (1 N), AVS TITRINORM Reag. Ph. Eur., Reag. USP, NF volumetric solution	10 L	30024.415
Hydrochloric acid 1 mol/L (1 N), AVS TITRINORM Reag. Ph. Eur., Reag. USP, NF volumetric solution	20 L	30024.448
Hydrochloric acid 2 mol/L (2 N), AVS TITRINORM volumetric solution	1 L	30025.293
Hydrochloric acid 2 mol/L (2 N), AVS TITRINORM volumetric solution	2,5 L	30025.320
Hydrochloric acid 2 mol/L (2 N), AVS TITRINORM volumetric solution	5 L	30025.362
Hydrochloric acid 2 mol/L (2 N), AVS TITRINORM volumetric solution	5 L	30025.373
Hydrochloric acid 2 mol/L (2 N), AVS TITRINORM volumetric solution	10 L	30025.407
Hydrochloric acid 3.571 mol/L (N/0.28), AVS TITRINORM volumetric solution	1 L	5610.1000
Hydrochloric acid 3.571 mol/L (N/0.28), AVS TITRINORM volumetric solution	10 L	5610.9010
Hydrochloric acid 4 mol/L (4 N), VOLUSOL® volumetric solution	1 L	310701.1000
Hydrochloric acid 5 mol/L (5 N), AVS TITRINORM volumetric solution	1 L	30018.298

Description	Pk	Cat. No.
Hydrochloric acid 5 mol/L (5 N), AVS TITRINORM volumetric solution	2,5 L	30018.320
Hydrochloric acid 5 mol/L (5 N), AVS TITRINORM volumetric solution	5 L	30018.360
Hydrochloric acid 5 mol/L (5 N), AVS TITRINORM volumetric solution	20 L	30018.447
Hydrochloric acid 6 mol/L (6 N), AVS TITRINORM Reag. Ph. Eur. 3001500 volumetric solution	5 L	2611.5000
Iodine 0.0241 M (0.0482 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	85806.320
Iodine 0.025 M (0.05 N) in aqueous solution, AVS TITRINORM volumetric solution	500 ml	85805.260
Iodine 0.05 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30917.295
Iodine 0.05 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	30917.320
Iodine 0.5 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	250 ml	30914.238
Iodine 0.5 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30914.295
Lead(II) nitrate 0.1 mol/L (0.2 N) in aqueous solution	500 ml	307227.0500
Mercury(II) nitrate 0.01 mol/L (0.02 N) in aqueous solution	1 L	310274.1000
Nitric acid 1 mol/L (1 N), AVS TITRINORM volumetric solution	1 L	30065.291
Nitric acid 2 mol/L (2 N), AVS TITRINORM volumetric solution	1 L	310568.1000
Nitric acid 6 mol/L (6 N), AVS TITRINORM volumetric solution	1 L	310547.1000
Orthophosphoric acid 150 ml/l, AVS TITRINORM for TOC	2,5 L	310337.2500
Oxalic acid 0.005 mol/L (0.01 N), AVS TITRINORM volumetric solution	1 L	89619.290
Oxalic acid 0.05 mol/L (0.1 N), AVS TITRINORM volumetric solution	1 L	30093.297
Oxalic acid 0.1 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	85807.290
Oxalic acid 0.5 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30086.293
Perchloric acid 0.01 mol/L (0.01 N) in anhydrous acetic acid	1 L	87116.290
Perchloric acid 0.1 mol/L (0.1 N) in anhydrous acetic acid, AVS TITRINORM Reag. Ph. Eur. volumetric solution	500 ml	30110.264
Perchloric acid 0.1 mol/L (0.1 N) in anhydrous acetic acid, AVS TITRINORM Reag. Ph. Eur. volumetric solution	1 L	30110.297
Perchloric acid 0.1 mol/L (0.1 N) in anhydrous acetic acid, AVS TITRINORM Reag. Ph. Eur. volumetric solution	2,5 L	30110.320
Perchloric acid 1 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30111.291
Periodic acid 0.1 mol/L (0.1 N) in aqueous solution	1 L	309746.1000
Potassium bromide 0.1 M in aqueous solution	1 L	85808.290
Potassium chloride 0.2 mol/L (0.2 N) in aqueous solution volumetric solution	1 L	89511.290
Potassium chloride 1 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	85809.290
Potassium dichromate 0.04 mol/L (0.24 N) in aqueous solution, AVS TITRINORM volumetric solution, for COD determination according to NF T 90-101 standard	1 L	30892.298
Potassium dichromate 0.04 mol/L (0.24 N) with mercury (II) sulphate 80 g/l in sulphuric acid solution, AVS TITRINORM volumetric solution, for COD determination in water	1 L	30891.295
Potassium dichromate 0.04 mol/L (0.24 N) with mercury (II) sulphate 80 g/l in sulphuric acid solution, AVS TITRINORM volumetric solution, for COD determination in water	2,5 L	30891.420
Potassium dichromate 1/60 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	191005X
Potassium dichromate 1/6 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31396.291
Potassium hydroxide 0.05 mol/L (0.05 N) in ethanol, AVS TITRINORM volumetric solution	1 L	31305.297
Potassium hydroxide 0.1 mol/L (0.1 N) in ethanol, AVS TITRINORM volumetric solution	1 L	31303.291
Potassium hydroxide 0.1 mol/L (0.1 N) in methanol, AVS TITRINORM volumetric solution	1 L	32304.291
Potassium hydroxide 0.1 mol/L (0.1 N) in methanol, AVS TITRINORM volumetric solution	2,5 L	32304.427
Potassium hydroxide 0.23 mol/L (0.23 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	5045.9010
Potassium hydroxide 0.5 mol/L (0.5 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31950.296
Potassium hydroxide 0.5 mol/L (0.5 N) in ethanol, AVS TITRINORM volumetric solution	500 ml	31308.264
Potassium hydroxide 0.5 mol/L (0.5 N) in ethanol, AVS TITRINORM volumetric solution	1 L	31308.297
Potassium hydroxide 0.5 mol/L (0.5 N) in methanol, AVS TITRINORM volumetric solution	1 L	31984.293
Potassium hydroxide 1 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31300.291
Potassium hydroxide 1 mol/L (1 N) in methanol, AVS TITRINORM volumetric solution	500 ml	89346.260
Potassium hydroxide 29,5 - 30,5% in aqueous solution	2,5 L	310550.2500
Potassium permanganate 0.002 mol/L (0.01 N) in aqueous solution	1 L	85021.290
Potassium permanganate 0.01 mol/L (0.05 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	85810.290
Potassium permanganate 0.02 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31455.295
Potassium permanganate 0.02 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	31455.320
Potassium permanganate 0.05 mol/L (0.25 N) in aqueous solution	1 L	85178.290
Potassium permanganate 0.2 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31451.292
Potassium permanganate 0.2 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	31451.326
Potassium thiocyanate 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31481.295
Silver nitrate 0.01 mol/L (0.01 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30476.291
Silver nitrate 0.01 N in 2-propanol, AVS TITRINORM	1 L	85102.290
Silver nitrate 0.025 mol/L (0.025 N)	2,5 L	88017.320
Silver nitrate 0.02 mol/L (0.02 N) in 2-propanol	1 L	89278.290
Silver nitrate 0.02 mol/L (0.02 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	191265J
Silver nitrate 0.04 mol/L (0.04 N) in aqueous solution	1 L	302636.1000
Silver nitrate 0.05 mol/L (0.05 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30475.297
Silver nitrate 0.05 mol/L (0.05 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	30475.322
Silver nitrate 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM Reag. Ph. Eur., USP volumetric solution	1 L	30472.290
Silver nitrate 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM Reag. Ph. Eur., USP volumetric solution	1 L	30472.297
Silver nitrate 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM Reag. Ph. Eur., USP volumetric solution	2,5 L	30472.322
Silver nitrate 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM Reag. Ph. Eur., USP volumetric solution	2,5 L	30472.323
Silver nitrate 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM Reag. Ph. Eur., USP volumetric solution	10 L	30472.402
Silver nitrate 14,52 g/L 0.0855 mol/L (0.0855 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30488.292
Silver nitrate 1 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	250 ml	30471.237
Silver nitrate 1 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30471.294
Silver nitrate 4,791 g/l 0.0282 mol/L (0.0282 N) in aqueous solution	1 L	85698.290
Silver sulphate 10 g/l in sulphuric acid, AVS TITRINORM volumetric solution, for COD determination according to NF T 90-101 standard	1 L	30491.247
Silver sulphate 10 g/l in sulphuric acid, AVS TITRINORM volumetric solution, for COD determination according to NF T 90-101 standard	2,5 L	30491.420
Silver sulphate 6,6 g/l in sulphuric acid, AVS TITRINORM volumetric solution, for COD determination according to NF T 90-101 standard	1 L	30492.241

Description	Pk	Cat. No.
Silver sulphate 6,6 g/L in sulphuric acid, AVS TITRINORM volumetric solution, for COD determination according to NF T 90-101 standard	2,5 L	30492.423
Sodium carbonate 0.5 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31524.294
Sodium chloride 0,5 mol/L 0,5 N in aqueous solution, AVS TITRINORM volumetric solution	1 L	85812.290
Sodium chloride 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	85811.290
Sodium chloride 1 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31535.292
Sodium dodecyl sulphate (SDS) 0.004 mol/L in aqueous solution	500 ml	307128.0500
Sodium dodecyl sulphate (SDS) 0.004 mol/L in aqueous solution	1 L	307128.1000
Sodium dodecyl sulphate (SDS) 0.01 mol/L in aqueous solution	1 L	309747.1000
Sodium hydrogen carbonate 0,35% in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	307212.2500
Sodium hydroxide 0.01 mol/L (0.01 N) in aqueous solution	1 L	305289.1000
Sodium hydroxide 0.04 mol/L (0.04 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31769.290
Sodium hydroxide 0.111 mol/L (0.111 N) in aqueous solution, AVS TITRINORM volumetric solution, for milk acidity analysis according to Dornic	1 L	31760.290
Sodium hydroxide 0.111 mol/L (0.111 N) in aqueous solution, AVS TITRINORM volumetric solution, for milk acidity analysis according to Dornic	5 L	31760.368
Sodium hydroxide 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31770.294
Sodium hydroxide 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	5 L	31770.363
Sodium hydroxide 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	5 L	31770.374
Sodium hydroxide 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	31770.408
Sodium hydroxide 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	20 L	31770.443
Sodium hydroxide 0.205 mol/L (0.205 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	30036.400
Sodium hydroxide 0.25 mol/L (0.25 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31956.296
Sodium hydroxide 0.2 mol/L (0.2 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31952.293
Sodium hydroxide 0.5 mol/L (0.5 N) in aqueous solution, AVS TITRINORM Reag. Ph. Eur. volumetric solution	1 L	31951.290
Sodium hydroxide 0.5 mol/L (0.5 N) in aqueous solution, AVS TITRINORM Reag. Ph. Eur. volumetric solution	5 L	31951.370
Sodium hydroxide 0.5 mol/L (0.5 N) in aqueous solution, AVS TITRINORM Reag. Ph. Eur. volumetric solution	10 L	31951.404
Sodium hydroxide 1 mol/L (1 N) in aqueous solution, AVS TITRINORM Reag. Ph. Eur., Reag. USP, NF volumetric solution	1 L	31627.290
Sodium hydroxide 1 mol/L (1 N) in aqueous solution, AVS TITRINORM Reag. Ph. Eur., Reag. USP, NF volumetric solution	5 L	31627.368
Sodium hydroxide 1 mol/L (1 N) in aqueous solution, AVS TITRINORM Reag. Ph. Eur., Reag. USP, NF volumetric solution	10 L	31627.404
Sodium hydroxide 2 mol/L (2 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	98108.290
Sodium hydroxide 2 mol/L (2 N) in aqueous solution, AVS TITRINORM volumetric solution	5 L	98108.360
Sodium hydroxide 2 mol/L (2 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	98108.400
Sodium hydroxide 4 mol/L (4 N) in aqueous solution, AVS TITRINORM volumetric solution low in carbonate	1 L	191373M
Sodium hydroxide 5 mol/L (5 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	31624.320
Sodium hydroxide 8 mol/L (8 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	89745.290
Sodium metaarsenite 0.1 M (0.2 N) in aqueous solution	1 L	309744.1000
Sodium nitrite 0.1 N, AVS TITRINORM volumetric solution	2,5 L	89295.320
Sodium peroxodisulphate 1 mol/L in aqueous solution, AVS TITRINORM volumetric solution, for TOC	2,5 L	306448.2500
Sodium thiosulphate 0.01 mol/L (0.01 N) in aqueous solution, VOLUSOL® volumetric solution	1 L	309337.1000
Sodium thiosulphate 0.039 mol/L (0.039 N) in aqueous solution	2,5 L	88946.320
Sodium thiosulphate 0.05 M (0.05N) volumetric solution	1 L	85813.290
Sodium thiosulphate 0.05 M (0.05N) volumetric solution	10 L	85813.410
Sodium thiosulphate 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31553.294
Sodium thiosulphate 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	5 L	31553.363
Sodium thiosulphate 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	31553.408
Sodium thiosulphate 0.2 mol/L (0.2 N) in aqueous solution	1 L	302332.1000
Sodium thiosulphate 1 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	31547.293
Sulphuric acid 0.005 mol/L (0.01 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	30147.408
Sulphuric acid 0.01 mol/L (0.02 N) in aqueous solution, AVS TITRINORM volumetric solution	5 L	191736T
Sulphuric acid 0.02 mol/L (0.04 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30146.291
Sulphuric acid 0.02 mol/L (0.04 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	30146.400
Sulphuric acid 0.05 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30150.295
Sulphuric acid 0.05 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	30150.320
Sulphuric acid 0.05 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	5 L	30150.375
Sulphuric acid 0.05 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	30150.400
Sulphuric acid 0.13 mol/L (0.26 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	5046.9010
Sulphuric acid 0.1 mol/L (0.2 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30145.297
Sulphuric acid 0.1 mol/L (0.2 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	30145.402
Sulphuric acid 0.25 mol/L (0.5 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30143.291
Sulphuric acid 0.25 mol/L (0.5 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	30143.405
Sulphuric acid 0.5 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30144.294
Sulphuric acid 0.5 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	30144.328
Sulphuric acid 0.5 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	5 L	30144.363
Sulphuric acid 0.5 mol/L (1 N) in aqueous solution, AVS TITRINORM volumetric solution	10 L	30144.408
Sulphuric acid 1 mol/L (2 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30149.291
Sulphuric acid 1 mol/L (2 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	30149.325
Sulphuric acid 1 mol/L (2 N) in aqueous solution, AVS TITRINORM volumetric solution	5 L	30149.371
Sulphuric acid 2.5 mol/L (5 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	191675A
Sulphuric acid 4 mol/L (8 N) in aqueous solution, AVS TITRINORM volumetric solution, for COD determination according to NF T 90-101 standard	1 L	30148.297
Sulphuric acid 4 mol/L (8 N) in aqueous solution, AVS TITRINORM volumetric solution, for COD determination according to NF T 90-101 standard	2,5 L	30148.320
Sulphuric acid 5 mol/L (10 N) in aqueous solution, AVS TITRINORM volumetric solution	2,5 L	191665V
Tetrabutylammonium hydroxide 0.1 mol/L (0.1 N) in 2-propanol 90% (v/v)/methanol 10% (v/v), AVS TITRINORM volumetric solution	500 ml	28533.261
Tetrabutylammonium hydroxide 0.1 mol/L (0.1 N) in toluene 90% (v/v)/methanol 10% (v/v), AVS TITRINORM volumetric solution	500 ml	28532.267
Zinc sulphate 0.1 mol/L (0.1 N) in aqueous solution, AVS TITRINORM volumetric solution	1 L	30498.296



Certified reference material for standardisation of volumetric solutions

CERTIFIED REFERENCE MATERIALS (CRMS) FOR STANDARDISATION OF VOLUMETRIC SOLUTIONS

CRM's - secondary reference materials intended for standardisation of volumetric solutions in accordance with the Pharmacopoeia (Ph. Eur. and USP). These volumetric standards are prepared from high purity salts. Certified mass fraction is determined by classical analysis according to ISO/IEC 17025. Homogeneity and stability studies are performed according to the requirements of ISO 17034 and ISO Guide 35. All volumetric standards are traceable to SI (NIST or BAM).

- High purity prevents possible titration interference
- Accurately determined content decreases mistakes linked to the method
- Complete Certificate of Analysis supplied with each standard offers quality assurance
- Traceable to NIST or BAM standards

ISO 17025 / 17034

CAS No.	65-85-0	471-34-1	62-76-0	34962-29-3	7778-50-9	877-24-7	7758-05-6	497-19-8	7647-14-5	77-86-1	7440-66-6
Description	Benzoic acid	Calcium carbonate	di-Sodium oxalate	Iron(II) ethylenedi-ammonium sulfate	Potassium dichromate	Potassium hydrogen phthalate	Potassium iodate	Sodium carbonate anhydrous	Sodium chloride	Tris-(hydroxymethyl)-aminomethane (TRIS)	Zinc
Formula	C ₇ H ₆ O ₂	CaCO ₃	C ₂ Na ₂ O ₄	FeSO ₄ · NH ₃ CH ₂ CH ₂ NH ₃ SO ₄	K ₂ Cr ₂ O ₇	KC ₈ H ₅ O ₄	KIO ₃	Na ₂ CO ₃	NaCl	C ₄ H ₁₁ NO ₃	Zn

Description	Standards	Pk	Cat. No.
Benzoic acid	CRM	60 g	88395.060
Calcium carbonate	CRM	50 g	88396.050
di-Sodium oxalate	CRM	60 g	88397.060
Iron(II) ethylenediammonium sulfate	CRM	80 g	88398.080
Potassium dichromate	CRM	80 g	88399.080
Potassium hydrogen phthalate	CRM	80 g	88400.080
Potassium iodate	CRM	100 g	88401.100
Sodium carbonate anhydrous	CRM	80 g	88402.080
Sodium chloride	CRM	80 g	88403.080
Tris-(hydroxymethyl)-aminomethane (TRIS)	CRM	80 g	88404.080
Zinc	CRM	100 g	88405.100

INDICATORS

Description	Pk	Cat. No.
1,10-Phenanthroline hydrochloride monohydrate ≥99,0% analytical reagent	5 g	26230.102
1,10-Phenanthroline monohydrate ≥99,0% analytical reagent	5 g	26227.101
1,5-Diphenylcarbazide ≥97,0% analytical reagent	10 g	23550.120
5-Sulphosalicylic acid dihydrate ≥99%, AnalaR NORMAPUR® analytical reagent	100 g	20678.187
8-Quinololinol ≥99,0%, AnalaR NORMAPUR® analytical reagent	250 g	26123.237
Alizarin complexone, TECHNICAL	1 g	20118.081
Aniline blue, water soluble, TECHNICAL	100 g	21999.183
Bromocresol green, powder pH-indicator	25 g	200125B
Bromocresol green 0,04% in ethanol, TECHNICAL	250 ml	34301.237
Bromophenol blue 0,04% in ethanol, TECHNICAL	250 ml	34307.237
Bromothymol/L blue 0,04% in ethanol, TECHNICAL	250 ml	34303.234
Chromotropic acid disodium salt dihydrate ≥98,0% Reag, Ph, Eur., ACS analytical reagent	25 g	20261.132
Clarifying reagent for biological media	250 ml	27357.232
Congo red 1% in aqueous solution	1 L	31727.295
Dithizone ≥98,0%, AnalaR NORMAPUR® analytical reagent	5 g	23570.106
Dragendorff's reagent for analysis of alkaloids	250 ml	30989.236
Eriochrome Black T, TECHNICAL	100 g	26002.183
Fehling's reagent (kit, contains solution I and II) for qualitative determination of reducing sugars	1 L	31701.296
Fehling's reagent I (copper(II) sulphate solution) concentrate for qualitative determination of reducing sugars	500 ml	31965.264
Fehling's reagent I (copper(II) sulphate solution) for qualitative determination of reducing sugars	1 L	31963.291
Fehling's reagent II (L(+)-potassium sodium tartrate in sodium hydroxide solution) concentrate for qualitative determination of reducing sugars	500 ml	31966.267
Fehling's reagent II (L(+)-potassium sodium tartrate in sodium hydroxide solution) for qualitative determination of reducing sugars	1 L	31964.294
Ferriin (1,10-phenanthrolineferrous sulphate complex) (7 mg/ml FeSO ₄) in aqueous solution, AVS TITRINORM volumetric solution, for COD determination according to NF T 90-101 standard	100 ml	30890.188
Fluorescein disodium salt, TECHNICAL	100 g	260983T
Fluorescein disodium salt, TECHNICAL	5 kg	26098CF
Folin-Ciocalteu's reagent for analysis of phenols	500 ml	31360.264
Folin-Denis' reagent for analysis of uric acid	1 L	31351.296
Hydroquinone ≥99%, GPR RECTAPUR®	1 kg	24704.298

Description	Pk	Cat. No.
Indigo carmine analytical reagent	25 g	22537.138
Methyl orange 0,04% in aqueous solution, TECHNICAL pH-indicator	250 ml	31720.230
Methyl orange 0,04% in aqueous solution, TECHNICAL pH-indicator	1 L	31720.292
Methyl red 0,2 g/L in ethanol, TECHNICAL	250 ml	34302.231
Meyer's reagent for blood research	500 ml	31072.268
Murexide analytical reagent	10 g	25717.120
Nessler reagent for determination of ammonia and ammonium salts	500 ml	31074.265
Ninhydrin, AnalaR NORMAPUR® ACS, Reag, Ph, Eur, analytical reagent	5 g	25905.107
Ninhydrin, AnalaR NORMAPUR® ACS, Reag, Ph, Eur, analytical reagent	50 g	25905.153
Ninhydrin, AnalaR NORMAPUR® ACS, Reag, Ph, Eur, analytical reagent	100 g	25905.180
Ninhydrin 0,5% in 1-butanol, spray reagent for TLC	240 ml	30960.226
Nuclear Fast Red, TECHNICAL	5 g	27416.101
Orthoboric acid 10 g/L in aqueous solution, VOLUSOL®, with indicator	5 L	5732.5000
Orthoboric acid 40 g/L in aqueous solution for Kjeldahl determinations, with indicator	2,5 L	192316H
o-Tolidine 0,1% 1,6 M hydrochloric solution for chlorine determination in water according to the NF T 90-010 standard	1 L	28672.294
Patton-reeders reagent (Calconcarboxylic acid) analytical reagent	25 g	20326.136
Phenolphthalein, GPR RECTAPUR®	250 g	26237.231
Phenolphthalein 0,2% in ethanolic solution, TECHNICAL	1 L	31724.295
Phenolphthalein 1%, TECHNICAL	1 L	8626.1000
Phenolphthalein 1% in ethanol 50% pH-indicator	250 ml	210893Q
Phenolphthalein 1% in ethanol 50% pH-indicator	1 L	210894R
Phenol red 0,4 g/L in ethanol, TECHNICAL	250 ml	34304.237
Saffron, powder, TECHNICAL	5 g	27481.105
Schiff reagent for analysis of aldehydes	500 ml	30969.261
Soda lime, AnalaR NORMAPUR® analytical reagent, with indicator	1 kg	22666.293
Soda lime, AnalaR NORMAPUR® analytical reagent, with indicator	5 kg	22666.362
Sodium tetraphenylborate ≥99,5% analytical reagent	25 g	28187.138
Starch, soluble, AnalaR NORMAPUR® for iodometric titrations, analytical reagent	100 g	28610.187
Starch, soluble, AnalaR NORMAPUR® for iodometric titrations, analytical reagent	250 g	28610.234
Starch, soluble, AnalaR NORMAPUR® for iodometric titrations, analytical reagent	1 kg	28610.291
Thymol/L blue 0,04% in ethanol, TECHNICAL	250 ml	34300.234
Xylenol orange tetrasodium salt, TECHNICAL	5 g	26086.103

BDH '4.5' INDICATOR, pH 3,5 - 6,0 FOR TITRATION OF FIRST HYDROGEN OF PHOSPHORIC ACID

A mixed indicator for the titration of the first hydrogen of phosphoric acid, range pH 3,5 to 6,0

pH 3,5 Orange-red
 pH 4,4 Orange-grey
 pH 4,5 Pure grey
 pH 4,6 Bluish-grey
 pH 6,0 Deep blue

Description	Pk	Cat. No.
BDH '4.5' Indicator	500 ml	210414M
BDH '4.5' Indicator	2,5 L	210416X



UNIVERSAL INDICATOR ETHANOL SOLUTION TECHNICAL

pH 3 Red
 pH 4 Red-orange
 pH 5 Orange
 pH 6 Yellow
 pH 7 Yellow-green
 pH 8 Green
 pH 9 Green-blue
 pH 10 Violet
 pH 11 Violet-red

Description	Pack type	Pk	Cat. No.
Universal pH indicator in ethanol, Technical (pH 3 - 11)	Glass bottle	1 L	34352.290

Karl Fischer water determination

Visit our website for more information on compact volumetric, or coulometric Karl Fischer titrators and related reagents for water determination.

- Volumetric Karl Fischer titrators are for medium to large volumes of water (mg range), combining fast and precise water content determination with easy operation
- Coulometric Karl Fischer titrators are for small water volumes (µg range), combining fast and precise water content determination, with very simple operation



VOLUMETRIC REAGENTS FOR WATER DETERMINATION BY THE KARL FISCHER METHOD

These reagents are ideal for water determination including the analysis of aldehydes and ketones.

- Fast and stable endpoints for accurate results time and time again
- Low toxicity and pyridine-free
- Provide consistent results



Description	Pk	Cat. No.
Volumetric one-component titrating reagents		
CombiNORM 1, 1 mg H ₂ O/ml, used with methanol	1 L	85450.290
CombiNORM 2, 2 mg H ₂ O/ml, used with methanol	1 L	85451.290
CombiNORM 2, 2 mg H ₂ O/ml, used with methanol	2,5 L	85451.320
CombiNORM 5, 5 mg H ₂ O/ml, used with methanol	1 L	85452.290
CombiNORM 5, 5 mg H ₂ O/ml, used with methanol	2,5 L	85452.320
CombiNORM 5K, for one-component KF titrations in aldehydes and ketones, 5 mg H ₂ O/ml, used with Solvent K	1 L	85463.290
CombiNORM 5K, for one-component KF titrations in aldehydes and ketones, 5 mg H ₂ O/ml, used with Solvent K	2,5 L	85463.320
Combi solvent E (ethanol-based working medium)	1 L	85454.290
Combi solvent E (ethanol-based working medium)	2,5 L	85454.320
Keto solvent, working medium, for one-component KF titrations in aldehydes and ketones	1 L	85459.290
Lipo solvent CM, non polar reagent (working medium), for non polar substances, oils and fats	1 L	85455.290
Lipo solvent HM, non polar reagent (working medium), for non polar substances, oils and fats	1 L	85456.290
Methanol quick (working medium), for accelerating one-component KF titration, used with CombiNORM	1 L	85457.290
Methanol quick (working medium), for accelerating one-component KF titration, used with CombiNORM	2,5 L	85457.320
Solvent K (working medium), for one-component KF titrations in aldehydes and ketones, used with CombiNORM 5K	1 L	85464.290
Solvent K (working medium), for one-component KF titrations in aldehydes and ketones, used with CombiNORM 5K	2,5 L	85464.320
Volumetric two-component titrating reagents		
TitrANT 1, 1 mg H ₂ O/ml, used with Solvent	1 L	85465.290
TitrANT 2, 2 mg H ₂ O/ml, used with Solvent	1 L	85466.290
TitrANT 2E, ethanol-based, 2 mg H ₂ O/ml, used with Solvent E	1 L	85467.290
TitrANT 5, 5 mg H ₂ O/ml, used with Solvent	1 L	85468.290
TitrANT 5, 5 mg H ₂ O/ml, used with Solvent	2,5 L	85468.320
TitrANT 5E, ethanol-based, 5 mg H ₂ O/ml, used with Solvent E	1 L	85469.290
Solvent (working medium), for used with all TitrANTs	1 L	85453.290
Solvent (working medium), for used with all TitrANTs	2,5 L	85453.320
Solvent E, ethanol-based working medium	1 L	85460.290
Solvent (crude), working medium, for titration in oils	1 L	85458.290
Solvent OIL (working medium), for titration in oils	1 L	85462.290
Solvent CM (working medium), for titration in oils	1 L	85461.290

COULOMETRIC REAGENTS FOR WATER DETERMINATION BY THE KARL FISCHER METHOD

Both analyte and catholyte solutions are with improved formulation to increase the speed and accuracy of titration when determining water content at the microgram level.

- Reach endpoint quickly and consistently
- Long shelf life
- Stable endpoint

Description	Pk	Cat. No.
Analyte solutions		
Coulometric reagent A, for cells with diaphragm	500 ml	85472.260
Coulometric reagent A OVEN, for use with oven, for cells with and without diaphragm	500 ml	85476.260
Coulometric reagent AD, for cells without diaphragm	500 ml	85474.260
Coulometric reagent AG-H, for applications with long-chained hydrocarbons, for cells with and without diaphragm	500 ml	85475.260
Coulometric reagent AG, for cells with and without diaphragm	1 L	85470.290
Coulometric reagent E, ethanol-based, for cells with and without diaphragm	500 ml	85473.260
Coulometric reagent K, for applications with ketones, for cells with diaphragm	500 ml	85478.260
Coulometric reagent OIL, for applications with oils, for cells with diaphragm	500 ml	85477.260
Catholyte solutions		
Coluometric reagent CG	50 ml	85471.130
Coluometric reagent CG-K, for applications with ketones	50 ml	85479.130

STANDARDS FOR WATER DETERMINATION BY THE KARL FISCHER METHOD

The tightening of regulatory requirements and the increasing demands of QA/QC methodology is becoming more important across all market sectors. The demand for standards, to support the testing methods, continues to increase and this growth applies to water determination according to Karl Fischer. VWR now offers a complete range of Karl Fischer water standards as CRMs, to calibrate and monitor equipment and check test results.

- CRMs acc. to ISO 17025 / ISO 17034
- CRM acc. to ASTM (in liquid petroleum)
- Broad product range for both volumetric + KF coulometric titrations and indirect oven method
- Liquid and solid water standards available
- Supplied with a detailed Certificate of Analysis

Our range of Karl Fischer water standards are Certified Reference Materials acc to ISO 17025 and ISO 17034. The standards are available both in liquid and solid form.

We also offer a range of Karl Fischer water standards as CRM for determination in liquid petroleum according to ASTM. The water content in standards in liquid petroleum is determined using ASTM D6304 method.

When the Cat. No. (Pk) ends with a

.005 then it is 10×5 ml

.002 then it is 10×2 ml

.020 then it is 5×20 ml

Description	Concentration	Pack type	Pk	Cat. No.
KF water standards				
Coulometric standard 0,01% water (xylenes based)	100 µg/g	Pack of 10× 4 g ampoules	10 Ampoul	88434.004
Coulometric standard 0,01% water (propylene carbonate based)	100 µg/g	Pack of 10× 4 g ampoules	10 Ampoul	88435.004
Coulometric standard 0,1% water	1000 µg/g	Pack of 10× 4 g ampoules	10 Ampoul	88427.004
Coulometric standard 0,1% water	1000 µg/g	Pack of 10× 8 g ampoules	10 Ampoul	88427.008
Coulometric standard 1% water	10000 µg/g	Pack of 10× 4 g ampoules	10 Ampoul	85487.004
Coulometric standard 1% water	10000 µg/g	Pack of 10× 8 g ampoules	10 Ampoul	85487.008
KF water standards in liquid petroleum conforming to ASTM D1744, E1064, D4377				
CRM Water standard	60 µg/g	Pack of 10×5 ml vials	1 KIT	85482.005
CRM Water standard	100 µg/g	Pack of 10×2 ml vials	1 KIT	85483.002
CRM Water standard	100 µg/g	Pack of 10×5 ml vials	1 KIT	85483.005
CRM Water standard	100 µg/g	Pack of 5×20 ml vials	1 KIT	85483.020
CRM Water standard	1000 µg/g	Pack of 10×2 ml vials	1 KIT	85484.002
CRM Water standard	1000 µg/g	Pack of 10×5 ml vials	1 KIT	85484.005
CRM Water standard	1000 µg/g	Pack of 5×20 ml vials	1 KIT	85484.020
CRM Water standard	5000 µg/g	Pack of 10×2 ml vials	1 KIT	85485.002
CRM Water standard	5000 µg/g	Pack of 10×5 ml vials	1 KIT	85485.005
CRM Water standard	5000 µg/g	Pack of 5×20 ml vials	1 KIT	85485.020
KF water standards				
Volumetric standard 0,5% water	5000 µg/ml	Bottle	250 ml	85488.230
Volumetric standard 0,5% water	5000 µg/ml	Bottle	500 ml	85488.260
Volumetric standard 0,5% water	5000 µg/ml	Bottle	1 L	85488.290
Volumetric standard 1,0% water	10000 µg/ml	Bottle	500 ml	85489.260
Karl Fischer Solid standard for oven method	1%	Bottle	5 g	88433.005
Lactose solid standard	4,98 ±0,03% H ₂ O		10 g	85449.100
Karl Fischer potassium citrate standard for oven method	5,55%	Bottle	10 g	88432.100
Karl Fischer volumetric fixed water standard - sodium tartrate dihydrate	15,66 +/- 0,05% H ₂ O	Glass bottle	1 g	88428.001
Karl Fischer volumetric fixed water standard - sodium tartrate dihydrate	15,66 +/- 0,05% H ₂ O	Glass bottle	10 g	88428.100
Karl Fischer standard di-sodium tartrate dihydrate	15,61 - 15,71% H ₂ O	Glass bottle	100 g	85692.100
Karl Fischer Liquid standard mineral oil based	<30 ppm	Pack of 10× 8 g ampoules	10 Ampoul	88429.008



MEASURING CYLINDERS

Borosilicate 3.3 glass, class A, tall form.

- Calibrated to contain (TC, In)
- Hexagonal glass base with spout
- Blue graduations with ring marks at major graduations

DIN 12680

Batch number and enclosed batch certificate.

Capacity (ml)	Division (ml)	Tolerance ($\pm$ ml)	Pk	Cat. No.
5	0,1	0,05	2	612-3832
10	0,2	0,1	2	612-3833
25	0,5	0,25	2	612-3834
50	1	0,5	2	612-3835
100	1	0,5	2	612-3836
250	2	1	2	612-3837
500	5	2,5	2	612-3838
1000	10	5	1	612-3839
2000	20	10	1	612-3840



VOLUMETRIC FLASKS

Borosilicate 3.3 glass, class A.

- PP white stopper
- Marks in white and inscriptions in blue enamel
- Calibrated to contain (TC, In)

DIN EN ISO 1042.

Batch number and enclosed batch certificate.

Capacity (ml)	NS	Tolerance ($\pm$ ml)	Pk	Cat. No.
5	10/19	0,040	2	612-3738
10	10/19	0,040	2	612-3740
20	10/19	0,040	2	612-3741
25	10/19	0,040	2	612-3742
50	12/21	0,060	2	612-3743
100	14/23	0,100	2	612-3744
200	14/23	0,150	2	612-3745
250	14/23	0,150	2	612-3746
500	19/26	0,250	2	612-3818
1000	24/29	0,400	1	612-3819
2000	29/32	0,600	1	612-3820



BEAKERS, LOW FORM

Borosilicate 3.3 glass, with spout.

- Very good chemical resistance
- High temperature resistance
- Autoclavable
- Volume graduations and labelling area

An economical alternative for a wide range of laboratory applications.

DIN 12331, ISO 3819

Capacity (ml)	Height (mm)	Ext.Ø (mm)	Pk	Cat. No.
25	50	34	10	213-1120
50	60	42	10	213-1121
100	70	50	10	213-1122
150	80	60	10	213-1123
250	95	70	10	213-1124
400	110	80	10	213-1125
600	125	90	10	213-1126
800	135	100	10	213-1127
1000	145	105	10	213-1128
2000	185	130	4	213-0469
3000	210	150	1	213-1130
5000	270	170	1	213-1131
10000	350	217	1	213-1132



BEAKERS, LOW FORM, HEAVY-DUTY

Borosilicate 3.3 glass, with spout.

- Good chemical and thermal shock resistance
- Durable labelling area with matt finish and white graduated scale
- Spout designed for optimum performance

Heavy-duty beakers have better mechanical stability than the standard products due to thicker walls. The reinforced rims increase shock resistance and reduce the risk of breakage. Due to the increased wall thickness resistance to rapid temperature changes is not as good as that of the standard product, therefore, slow, uniform heating is recommended.

Capacity (ml)	Height (mm)	Ext.Ø (mm)	Pk	Cat. No.
50	60	42	10	213-0462
100	70	50	10	213-0476
150	80	60	10	213-0477
250	95	70	10	213-0478
400	110	80	10	213-0479
600	125	90	8	213-0480
1000	145	105	6	213-0481

213-0478



213-0496

BEAKERS, LOW FORM, PP

PP, translucent.

- Printed graduations
- Can be stacked when empty to save space while storing
- Withstand temperatures of 0 to 121 °C
- Resin meets US FDA 21 CFR requirements

Ideal for general laboratory use. With spout and exceptionally 'easy to read' printed graduations.

Capacity (ml)	Pk	Cat. No.
25	6	213-0511
50	6	213-0489
100	6	213-0490
250	6	213-0491
500	3	213-0492
1000	3	213-0493
2000	1	213-0494
3000	1	213-0495
5000	1	213-0496



BEAKERS, TALL FORM

Borosilicate 3.3 glass, with spout.

- Very good chemical resistance
- High temperature resistance
- Autoclavable
- Volume graduations and labelling area.

The economical alternative for a wide range of laboratory applications.

DIN 12331, ISO 3819

Capacity (ml)	Height (mm)	Ext.Ø (mm)	Pk	Cat. No.
50	70	38	10	213-1169
100	80	48	10	213-1170
150	95	54	10	213-1171
250	120	60	10	213-1172
400	130	70	10	213-1173
600	150	80	10	213-1174
800	175	90	10	213-1175
1000	180	95	10	213-1176
2000	240	120	6	213-0470
3000	280	135	1	213-1178



FACIAL TISSUES

Two ply facial tissues made from 100% cellulose.

- Extra soft

Colour: White

LxW (mm)	Packed	Pk	Cat. No.
195x200	150 sheets per box	150	115-0600



111-1846

SAFETY SPECTACLES, PRAGUE

These economical, compact cover glasses (OTG) fit over most prescription eyewear.

- Pantoscopic adjustment allows lens angle modification
- Adjustable temple length

2016/425/EU, EN 166:2001, EN 170; EN 166 FT CE (frame); 1 FT (lens).

Type	Lenses	Colour	Pk	Cat. No.
Anti-UV, anti-scratch, anti-fog	Clear PC	Blue	1	111-1846



111-1842

SAFETY SPECTACLES, ROME

Wrap-around protective eyewear offering a comfortable and custom fit all day long

- Adjustable temple length enables wearers to fit the eyewear to their facial profile
- Lightweight, frameless design
- Soft nose bridge for added comfort
- Easy lens replacement

2016/425/EU, EN 166:2001, EN 170; EN 166 FT CE (frame); 1 FT (lens).

Type	Lenses	Colour	Pk	Cat. No.
Anti-UV (2-1,2), anti-scratch, anti-fog	Clear PC	Blue	1	111-1842



111-1844

SAFETY SPECTACLES, STOCKHOLM

Extremely lightweight, modern safety eyewear with outstanding field of vision and exceptional protection.

- Moulded-in nose bridge provides uncompromised comfort and fit
- Single-piece lens that will fit most faces
- Soft rubber tip for additional comfort

2016/425/EU, EN 166:2001, EN 170, ISO 9001:2008; 166 FT CE (frame) 1 FT (lens).

Type	Lenses	Colour	Pk	Cat. No.
Anti-UV, anti-scratch, anti-fog	Clear PC	Transparent/black	1	111-1844



111-0930

VISITOR SPECTACLES, LISBON

Visitor glasses with wrap-around, clear polycarbonate lens and indirect ventilation.

- Anti-scratch/anti-fog coating
- Integrated brow guard
- Vented side shields

Weight: 46 g

2016/425/EU, EN 166, EN 170; 1 FT

Type	Lenses	Colour	Pk	Cat. No.
Anti-UV (2-1,2), anti-scratch, anti-fog	Clear PC	Transparent	1	111-0930



VWR Nitrile green gloves

NITRILE GLOVES, NITRILE GREEN

These disposable examination gloves are made from nitrile and are developed with sustainability in mind. They are free from chlorine, natural rubber latex proteins and rubber accelerators which makes them particularly skin friendly for users with latex allergy.

- Non sterile, powder-free
- Textured fingertips provide extra grip for wet or dry applications
- Synthetic inner coating for fast and easy glove donning
- Comfortable and strong glove material ensures stability and wearer comfort over long periods of time

Thanks to new sustainable and innovative production methods, you can reduce your eco-footprint while still wearing a glove that is skin friendly, and provides superior barrier protection against blood-borne pathogens and viruses. The production process for these gloves has been redesigned to save gas, electricity and CO₂ emissions.

EN 455, EN 420, EN 374-1/2/4/5; ISO 16523; ASTM D6319, ASTM F1671; Medical Device Class 1; Cat. III; AQL 1,5

Food contact approved

Supplied in a practical 200 piece big pack for simplified stock logistics, reduced replacement intervals in the workplace and less packaging waste.

* Thickness is double measured, minimum values.

Model	Nitrile PF Green
Ambidextrous/hand-specific	Ambidextrous
Disposable/reusable	Disposable
Latex/latex-free	Latex-free
Powdered/powder-free	Powder-free
Finish	Textured fingertips
Cuff style	Rolled
Cuff thickness	0,10 mm*
Finger thickness	0,14 mm*
Palm thickness	0,12 mm*
EN norm	EN 455, EN 420, EN 374-1/2/4/5
Food contact approved	+

Glove size	Colour	Length (mm)	Packed	Pk	Cat. No.
XS	Mint green	240	200/box	200	112-5154
S	Mint green	240	200/box	200	112-5155
M	Mint green	240	200/box	200	112-5156
L	Mint green	240	200/box	200	112-5157
XL	Mint green	240	200/box	180	112-5158



MAGNETIC STIRRER, LAB DISC

Extremely flat, compact magnetic stirrer with no moving parts. Reverses direction of rotation every 30 seconds to ensure optimum mixing.

- Selectable reversible rotation direction
- Wear-free drive
- Set-up plate and casing made of chemically resistant materials
- Slip-proof, safe stand

IP protection class according to DIN EN 60529: IP 65

Supplied with two beakers (150 ml) and three magnetic stirring bars (10 mm, 20 mm, 30 mm).

Model	lab disc
Max. stirring capacity H ₂ O (ml)	800
Speed range (min ⁻¹)	15 - 1500
Rating input/output (W)	5/3
Plate material	Polyester
Plate dimensions (mm)	Ø 100
WxDxH (mm)	117x180x12
Weight (kg)	0,3

Description	Pk	Cat. No.
Magnetic stirrer, lab disc, EU-/CH-/UK-plug	1	442-0883



MAGNETIC STIRRING BARS, CYLINDRICAL

PTFE covered, strong Alnico V magnetic core. Rounded, smooth surface.

- Very good chemical resistance
- Temperature resistant, suitable for use at high and low temperatures (–200 to +280 °C)

Length (mm)	Ø (mm)	Pk	Cat. No.
6	3	10	442-0259
8	3	10	442-4520
10	6	10	442-0295
12	4,5	10	442-4521
15	4,5	10	442-4522
20	6	10	442-4523
25	6	10	442-4524
30	6	5	442-4525
35	6	5	442-4530
40	8	5	442-4527
50	8	5	442-4528
60	10	5	442-4529
70	10	5	442-0260
80	10	5	442-0261



MAGNETIC STIRRING BARS, CYLINDRICAL, WITH CENTRE RING

PTFE covered, strong Alnico V magnetic core. Smooth surface. For containers with slightly uneven bases.

- Very good chemical resistance
- Temperature resistant, suitable for use at high and low temperatures (–200 to +280 °C)

Length (mm)	Ø (mm)	Pk	Cat. No.
8	3	10	442-4500
12	6	10	442-4501
15	4,5	10	442-4502
15	8	10	442-4503
20	6	10	442-4504
25	6	10	442-4505
25	10	10	442-4506
30	6	10	442-4507
35	6	10	442-4508
40	8	10	442-4509
45	8	10	442-4510
50	8	5	442-4511
57	24	1	442-0256
60	10	5	442-4512
70	10	5	442-4513
108	24	1	442-0257
159	24	1	442-0258



MAGNETIC STIRRING BARS, PLAIN

PTFE covered, strong Alnico V magnetic core. Smooth surface with rounded edges that intensify the stirring effect, even at low speeds.

- Very good chemical resistance
- Temperature resistant, suitable for high and low temperature applications (–200 to +280 °C)

Length (mm)	Ø (mm)	Pk	Cat. No.
10	6	10	442-0262
13	8	10	442-0263
15	4,5	10	442-0264
20	6	10	442-0265
20	7	10	442-0266
25	6	10	442-0267
25	10	10	442-0268
30	7	10	442-0269
35	10	10	442-0270
40	8	5	442-0271

Length (mm)	Ø (mm)	Pk	Cat. No.
50	10	5	442-0272
57	27	5	442-0278
60	7	5	442-0273
65	13	5	442-0274
70	10	5	442-0275
75	13	5	442-0276
80	10	5	442-0277
108	27	5	442-0279
159	27	5	442-0280



MAGNETIC STIRRING BARS, PLAIN, ECONOMY

PTFE covered, strong Alnico V magnetic core. Smooth surface with rounded edges which enhance agitation effect even at low speeds. Inexpensive, high performance.

- Very good chemical resistance
- Temperature resistant, suitable for use at high and low temperatures (–200 to +280 °C)

Length (mm)	Ø (mm)	Pk	Cat. No.
12	3	10	442-0482
25	8	10	442-0483
40	8	5	442-0484
50	8	5	442-0485



MAGNETIC STIRRING BAR RETRIEVERS

PTFE covered, strong Alnico V magnetic core. For the removal of stirring magnets from vessels of all kinds.

- Very good chemical resistance
- Temperature resistant, suitable for use at high and low temperatures (–200 to +280 °C)

Stirrer Ø (mm)	Length (mm)	Pk	Cat. No.
10	150	1	442-0523
10	250	1	442-0524
10	350	1	442-0525
10	450	1	442-0526



BENCH PROTECTORS

High quality, smooth, absorbent paper that quickly absorbs liquid spills with a thick, laminated polyethylene layer that prevents seeping onto the work surface.

- Retains leaked reagents in radio-chemical laboratories and prevents radioactive contamination
- Enables recovery of expensive leaked materials
- Breakage protection for hard surfaces
- Absorption layer for removing water or solvent from desiccant chambers
- Impermeable protective material for lining animal cages

Absorbance rate: 115-9220 and 115-9221: 500 ml/m²

Absorbance rate: 115-0673: 750 ml/m²

Colour	LxW (mm)	Packed	Pk	Cat. No.
White	460x570	Single sheets	50	115-9220
White	460x50 000	Roll	1	115-9221
White	460x570	Single sheets	50	115-0673



LAB MATS, SILICONE

The reusable, environmentally friendly Lab Mat is an economical solution to help keep bench tops clean and safe from stains, spills and wear. The Lab Mat is made from a durable FDA-approved silicone material that creates a stain resistant, washable working surface. It is chemically inert and does not react with most chemicals.

- Protect bench tops from hot items up to 200 °C
- Large anti-skid and noise-dampening working surface
- Lip design around the outer edge of the mat helps contain spillage
- Can be cleaned with standard disinfectants in a sink or dishwasher, allowing repeat use
- Mat can be rolled up for compact storage
- Autoclavable at 121° for 15 minutes

The Lab Mat can be used centrifuges, vortex mixers, hot plates, stirrers, pipettes. Ideal for every type of laboratory and more specialised areas such as cold rooms, cleanrooms, sterile suites and areas where high sterility is a requirement.

Thickness (mm)	Colour	LxW (mm)	Pk	Cat. No.
2	Purple	350x600	1	111-9200

Setting science in motion to create a better world



AUSTRIA

VWR International GmbH
Graumannsgasse 7
1150 Wien
Tel.: +43 1 97 002 0
info.at@vwr.com

BELGIUM

VWR International bv
Researchpark Haasrode 2020
Geldenaaksebaan 464
3001 Leuven
Tel.: +32 (0) 16 385 011
vwr.be@vwr.com

CZECH REPUBLIC

VWR International s. r. o.
Veetee Business Park
Pražská 442
CZ - 281 67 Stříbrná Skalice
Tel.: +420 321 570 321
info.cz@vwr.com

DENMARK

VWR International A/S
Tobaksvej 21
2860 Søborg
Tel.: +45 43 86 87 88
info.dk@vwr.com

FINLAND

VWR International Oy
Valimotie 17-19
00380 Helsinki
Tel.: +358 (0) 9 80 45 51
info.fi@vwr.com

FRANCE

VWR International S.A.S.
Immeuble Estréo
1-3 rue d'Aurion
93114 Rosny-sous-Bois cedex
Tel.: 0 825 02 30 30* (national)
Tel.: +33 (0) 1 45 14 85 00
(international)
info.fr@vwr.com
* 0,18 € TTC/min + prix appel

GERMANY

VWR International GmbH
Hilpertstraße 20a
D - 64295 Darmstadt
Tel.: 0800 702 00 07* (national)
Tel.: +49 (0) 6151 3972 0 (international)
info.de@vwr.com
*Freecall

HUNGARY

VWR International Kft.
Simon László u. 4.
4034 Debrecen
Tel.: +36 52 521130
info.hu@vwr.com

IRELAND

VWR International Ltd
Orion Business Campus
Northwest Business Park
Ballycoolin
Dublin 15
Tel.: +353 (0) 1 88 22 222
sales.ie@vwr.com

ITALY

VWR International S.r.l.
Via San Giusto 85
20153 Milano (MI)
Tel.: +39 02 3320311
info.it@vwr.com

THE NETHERLANDS

VWR International B.V.
Postbus 8198
1005 AD Amsterdam
Tel.: +31 (0) 20 4808 400
info.nl@vwr.com

NORWAY

VWR International AS
Brynsalleen 4,
0667 Oslo
Tel.: +47 22 90 00 00
info.no@vwr.com

POLAND

VWR International Sp. z o.o.
Limbowia 5
80-175 Gdansk
Tel.: +48 58 32 38 200
info.pl@vwr.com

PORTUGAL

VWR International - Material de
Laboratório, Lda
Centro Empresarial de Alfragide
Rua da Indústria, nº 6
2610-088 Amadora
Tel.: +351 21 3600 770
info.pt@vwr.com

SPAIN

VWR International Eurolab S.L.U.
C/ Tecnología 5-17
A-7 Llinars Park
08450 - Llinars del Vallès
Barcelona
Tel.: +34 902 222 897
info.es@vwr.com

SWEDEN

VWR International AB
Fagerstagatan 18b
163 94 Stockholm
Tel.: +46 (0) 8 621 34 20
kundservice.se@vwr.com

SWITZERLAND

VWR International GmbH
Lerzenstrasse 16/18
8953 Dietikon
Tel.: +41 (0) 44 745 13 13
info.ch@vwr.com

UK

VWR International Ltd
Customer Service Centre
Hunter Boulevard - Magna Park
Lutterworth
Leicestershire
LE17 4XN
Tel.: +44 (0) 800 22 33 44
uksales@vwr.com

CHINA

VWR (Shanghai) Co., Ltd
Bld.No.1, No.3728 Jinke Rd,
Pudong New District
Shanghai, 201203- China
Tel.: 400 821 8006
info_china@vwr.com

INDIA

VWR Lab Products Private Limited
No.139, BDA Industrial Suburb,
6th Main, Tumkur Road, Peenya Post,
Bangalore, India - 560058
Tel.: +91 80 28078400
vwr_india@vwr.com

KOREA

Avantor Performance
Materials Korea Ltd
2F ACE Gwanggyo Tower I,
Daehak 4ro 17
Yeongtong-gu Suwon, Korea 16226
Tel.: +82 31 645 7256
saleskorea@avantorsciences.com

MIDDLE EAST & AFRICA

VWR International FZ-LLC
Office 203, DSP Lab Complex,
Dubai Science Park,
Dubai, United Arab Emirates
Tel.: +971 4 5573271
Info.mea@vwr.com

SINGAPORE

VWR Singapore Pte Ltd
18 Gul Drive
Singapore 629468
Tel.: +65 6505 0760
sales.sg@vwr.com

GO TO [VWR.COM](https://www.vwr.com) FOR THE LATEST NEWS, SPECIAL OFFERS AND DETAILS FROM YOUR LOCAL VWR SUPPORT TEAM