



General Catalog

Instruments and Reagents for Water Analysis

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Method of Analysis

Colorimetric Methods

These tests are simple and easy to run—the basic concept is one of adding a specific reagent which reacts with the analyte being tested to create a color. The intensity of this color is then measured. You can visually compare the intensity of the color developed against a known standard with our CheckIt® Comparator or Comparator System 2000+. Or—for even better accuracy, you can measure the color using a colorimeter (see our MD100, MD200, or MD600) or our SpectroDirect Spectrophotometer. As you will see, Lovibond® has a full line of colorimetric water quality tests.



Titrations

Titration is a simple chemical test in which a solution or tablet of a known concentration is added slowly to a sample of unknown concentration. At a given point (called the end point), the color of the sample will rapidly change, such as from red to blue. An easy calculation will then allow determination of the concentration of the analyte. Lovibond® MINIKITS are convenient, innovative titration kits that use tablets as the titrant.



Turbidimetric Methods

Turbidity is a measurement of the total number of particles suspended in a solution. Sources of this “cloudiness” may include organic and inorganic materials. To meet US EPA guidelines, turbidity detection has to be done by using a white light source which is 90° from the detector.



Electrochemical Methods

Some parameters in water such as pH, ORP and Conductivity can be measured using an electrochemical meter. These are precise instruments which (in effect) measure the flow of electricity through a water sample. In addition, other electrochemical instruments can measure Dissolved Oxygen in the sample using membrane technology.



Respirometric Methods

BOD is a measurement of the oxygen uptake (or demand) of microbiological organisms in a wastewater sample. Lovibond® offers an innovative product called the OxiDirect which allows precise BOD measurement without error prone sample dilutions. In addition, it can start providing BOD data within 1 day of initiating the test.



Parameter Guide

Parameter	MINIKITS	CHECKIT Comparator	Comparator 2000+ System	Biocide Test Kits	Test Kit, Other	MD 100 Colorimeters	MD 600 Colorimeter	SpectroDirect	OxiDirect BOD System	SD Testers	SD 300 pH & SD 320 Con	Oxi200 Meter	SensODirect 150	TurbCheck	TurbIDirect	Floc Testers
Acid Demand							■	■								
Alkalinity-M (Total)	■	■					■	■								
Alkalinity-P	■						■	■								
Aluminum		■				■	■	■								
Ammonia		■				■	■	■								
Ammonia, Free						■	■									
Arsenic					■			■								
Bardac® 22				■												
Biguanide (PHMB)							■									
Boron							■	■								
Bromine		■					■	■								
Bronopol				■												
Cadmium								■								
Chloride	■						■	■								
Chlorine		■	■		■	■	■	■								
Chlorine Dioxide		■				■	■	■								
Chromium, Hexavalent							■	■								
COD						■	■	■								
Conductivity										■		■	■			
Color of Water			■				■	■								
Cyanide, Free							■	■								
Cyanuric Acid	■						■	■								
DBNPA				■												
DEHA		■					■	■								
Fluoride		■	■			■	■	■								
Formaldehyde								■								
Hardness, Calcium	■						■									
Hardness, Total	■					■	■	■								
Hydrazine							■	■								

Parameter Guide

Parameter	MINIKITS	CHECKIT Comparator	Comparator 2000+ System	Biocide Test Kits	Test Kit, Other	MD 100 Colorimeters	MD 600 Colorimeter	SpectroDirect	OxiDirect BOD System	SD Testers	SD 300 pH & SD 320 Con	Oxi200 Meter	SensODirect 150	TurbidCheck	TurbidDirect	Floc Testers
Hydrogen Peroxide						■	■									
Iodine						■	■									
Iron	■				■	■	■									
Isothiazolone			■													
Lead							■									
Legionella				■												
Manganese	■				■	■	■									
MBTC			■													
Molybdate	■				■	■	■									
Monochloramines					■	■										
Nickel						■	■									
Nitrate		■				■	■									
Nitrite	■	■				■	■									
Nitrogen, Total						■	■									
Organophosphonate	■															
ORP									■	■		■				
Oxygen (Active or Dissolved)						■	■									
Ozone	■					■	■									
pH	■	■			■	■	■		■	■		■				
Phenols							■									
Phosphate, Ortho	■	■			■	■	■									
Phosphate, Acid Hydrolyzable						■	■									
Phosphate, Total						■	■									
Phosphonates						■	■									
Polyacrylate						■										
Potassium						■	■									
QAC	■															
Quats / Polyquat / Amines			■													
Redox									■	■		■				

Parameter	MINIKITS	CHECKIT Comparator	Comparator 2000+ System	Biocide Test Kits	Test Kit, Other	MD 100 Colorimeters	MD 600 Colorimeter	SpectroDirect	OxiDirect BOD System	SD Testers	SD 300 pH & SD 320 Con	Oxi200 Meter	SensODirect 150	TurbidCheck	TurbidDirect	Floc Testers
Salinity									■				■			
Silica		■	■			■	■									
Sulfate	■					■	■									
Sulfide						■	■									
Sulfite	■	■					■									
Surfactants, Anionic							■									
Suspended Solids						■	■									
Tannin	■															
TDS									■		■	■				
TOC							■									
Triazole							■									
Turbidity													■	■	■	
Urea							■	■								
Zinc		■					■	■								



TEST KITS



MINIKITS



CHECKIT®
Comparator



Comparator
2000+



Arsenic



Non-Oxidizing
Biocides



Legionella
Detection

MINIKITS

Highlights

- Easy to use
- Exact reagent dosing
- Utilize tablet reagents
- Long shelf life
- Supplied with all required accessories
- Safe storage



MINIKITS are titration tests that utilize tablet reagents. These easy to use test kits are supplied with everything the user requires to perform the test - including reagents, dilution tubes, and syringes for accurate water analysis.

Titration is a simple chemical test in which a solution or tablet of a known concentration is added slowly to a sample of unknown concentration. At a given point (called the end point), the color of the sample will rapidly change, such as from red to blue. An easy calculation will then allow determination of the concentration of the analyte. Lovibond® MINIKITS are convenient, innovative titration kits that use tablets as the titrant.

Advantages to using a tablet as the titrant:

- **Long Shelf Life** – the tablets used in the MINIKITS have at least a 5 year shelf life. A long shelf life is possible because each tablet is hermetically sealed within an individual aluminum foil pocket, protecting against challenging environmental conditions. This packaging keeps each tablet in perfect condition, right up until the time it is needed by the user. While liquid reagents have a faster reaction time, there are things that negatively affect most liquid reagents such as heat, oxidation, and sunlight – exposure to any of these environmental factors greatly reduce their stated shelf life and testing accuracy.
- **Guarantees exact dosing** – In a titration, the amount of titrant added is a key factor in determining results. With a tablet, this amount is known and exact – with a liquid reagent, drop size can vary based on the angle at which the dispensing bottle is held, or the pressure applied to the bottle.

MINIKITS

Parameter	Range	Methods			Part Number	Reagent	Part Number	Quantity
		Tablet Count	Speed Test	Yes/No Test				
Alkalinity-M	20 - 800 mg/l CaCO ₃ ≅ 0.4 - 16 mmol/l		■		41 44 40	Alk-test	51 55 70 BT	100
Alkalinity Caustic/P	20 - 500 mg/l CaCO ₃	■			41 41 50	Alkalinity-P-tablets Alkalinity-P (BaCl ₂)-tablets	51 51 01 51 51 10	250 100
Alkalinity-P	20 - 500 mg/l CaCO ₃	■			41 41 40	Alkalinity-P-Tablets	51 51 01	250
Alkalinity-M	10 - 500 mg/l CaCO ₃ ≅ 0.1 - 5 mmol/l	■			41 41 30	Total Alkalinity-tablets Alkalinity-P (BaCl ₂)-Tablets	51 53 21 BT 51 51 10	250 100
Calcium Hardness	20 - 800 mg/l CaCO ₃ ≅ 0.4 - 16 mmol/l		■		41 44 60	Cal-Test	51 55 80	100
Calcium Hardness	10 - 500 mg/l CaCO ₃ ≅ 0.1 - 5 mmol/l	■			41 41 60	Calcium Hardness	51 51 91 BT	250
Chloride	5 - 5000 mg/l Cl	■			41 41 80	Chloride	51 51 31	250
Cleaning Acid Strength	0.75 - 10% acid	■			41 41 00	Acid Concentration	50 54 20 BT	100
Cyanuric Acid , see Stabilizer								
Hardness Total (very low range)	1 - 10 mg/l CaCO ₃ ≅ 0.01 - 0.1 mmol/l	■			41 42 60	Hardness VLR	51 53 51 BT	250
Hardness Total (low range)	1 - 50 mg/l CaCO ₃ ≅ 0.01 - 0.5 mmol/l	■			41 42 50	Hardness LR (BW)*	51 51 71 BT	250
Hardness Total (Yes/No)	Limit 4 mg/l, 8 mg/l or 20 mg/l CaCO ₃ ≅ 0.04 or 0.08 or 0.2 mmol/l			■	41 42 30	Hardness YES / NO	51 53 61 BT	250
Hardness Total	20 - 800 mg/l CaCO ₃ ≅ 0.4 - 16 mmol/l		■		41 44 50	T Hardness-Test	51 55 90	100
Hardness Total	5 - 500 mg/l CaCO ₃ ≅ 0.05 - 5 mmol/l	■			41 42 40	Total Hardness	51 51 61	250
Nitrite	70 -1500 mg/l NaNO ₂	■			41 42 70	Nitrite No. 1 Nitrite No. 2	51 52 01 51 52 11 BT	250 250
Organo-Phosphonate	1 - 20 mg/l active O-P	■			41 41 10	Organo-Phosphonate No. 2 Organo-Phosphonate No. 1	46 53 51 51 29 61 BT	100 ml 250
QAC (Quaternary Ammonium Comp.)	0 - 500 mg/l active QAC Limit 200 mg/l (Yes/No)	■		■	41 41 70	QAC-Test	51 54 10 51 54 11	100 250
Stabilizer	20 - 200 mg/l Cyanuric Acid			■	41 42 20	CyA-TEST	51 13 70 BT	100
Sulfate (low range)	20 - 200 mg/l Na ₂ SO ₄	■			41 43 20	Sulfate No. 1 Sulfate No. 2	51 52 21 51 52 31	250 250
Sulfate	40 - 4000 mg/l SO ₄			■	41 43 10	Sulfate	51 54 51 BT	250
Sulfite (low range)	2 - 50 mg/l Na ₂ SO ₃	■			41 43 40	Sulfite No. 1	51 52 70	250
Sulfite (high range)	20 - 500 mg/l Na ₂ SO ₃	■			41 43 50	Sulfite No. 2 HR Sulfite No. 2 LR (BW)*	51 52 81 BT 51 53 31 BT	250 250
Tannin Index	2 - 20 units	■			41 43 60	Tannin No. 1 Tannin No. 2	50 35 00 50 35 11	100 250

*BW: Boiler Water

Tablet Count Method

In the tablet count method, the liquid titration solution and indicator are replaced by tablet reagents. A specific number of tablets is added to a defined sample volume until a chemically induced color change takes place. The concentration of the parameter being measured is calculated from the number of tablets required. The measuring range can be expanded by varying the sample volume.

Speed Test

The speed test is based on reverse titration. After adding a reagent tablet to a calibrated test tube, the water sample is added slowly until the color of the solution changes (e.g. from red to blue). The user can then obtain the result from the liquid level.

Yes/No Test

A Yes/No test tells the user whether a specific ingredient is present in the water and/or if its concentration is higher or lower than a defined level.

Turbidity Method

A two-section calibrated test tube is filled with the water sample and a reagent tablet added. The reagent creates a level of turbidity that is proportional to the concentration of the parameter being measured. The inner tube, which has a black dot on its base, is lowered until the dot is obscured by the turbidity. The result is read off from the water level in the inner tube.

CHECKIT® Comparator



The CHECKIT® Comparator is an accurate, easy-to-use test kit for water analysis. Simply add the reagent to the sample cell, rotate the disc until the color matches the sample and read the concentration value. The instructions provide a step-by-step explanation of how to conduct the water test, ensuring that even "non-chemists" can achieve reliable and accurate measurements quickly.

Test Kits include: Comparator, Color Disc, Sample Cells, Instructions, Reagents, Carrying Case and Tablet Crusher (when required for test).

COLOR DISCS

- Printed continuous gradient color discs provide accurate measurements without "extrapolating" between discrete color blocks. Just rotate the continuous gradient color wheel to obtain a color match with the reacted sample.

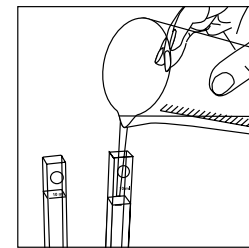
COMPARATOR HOUSING

- One piece comparator housing. No moving pieces that can easily break.
- Rugged
- Simply slip in the color disc until it clicks into place and you're ready to test.
- Simply view test results in the easy to read window.

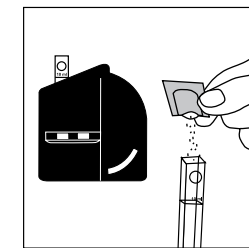
PLASTIC CELLS

- Frosted square viewing tubes for easy testing with accurate results.
- Supplied with "no-leak" rubberized stoppers to make proper mixing easy.

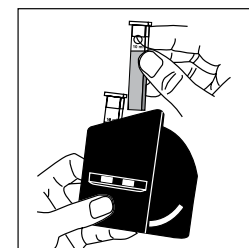
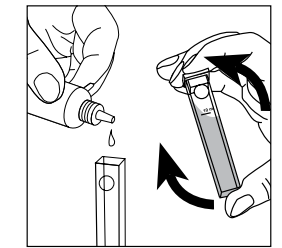
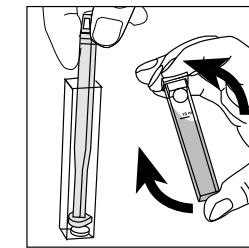
How It Works



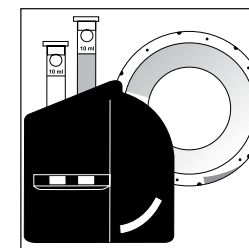
Collect sample and fill sample cells to the specified volume.



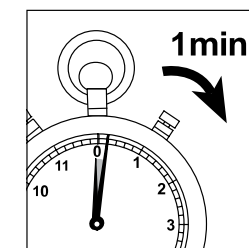
Add specified reagent -- Reagents come in Vario Powder Pack, tablet, or liquid formats. CHECKIT® Comparator Test kits are supplied with the necessary reagents.



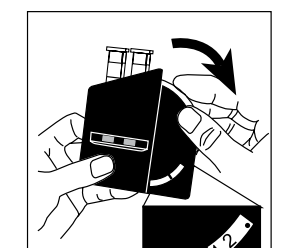
Insert sample cells into the CHECKIT® Comparator housing.



Insert Color Disc



If specified in test kit instructions, wait the recommended time period for proper color development.



Rotate color disc until you find a color match. Read off value in the lower right-hand corner.

Ordering Information

Item	P/N
CHECKIT® Comparator Housing For standard, 13.5 mm, viewing path length	14 50 00
D55 CHECKIT® Comparator Housing For 55 mm viewing path length	14 50 10
Sample Cells, 10 Pack 13.5 mm path length, 10 ml volume, includes lids	14 55 00
Tablet Crusher	36 41 09
Cleaning Cloth for Sample Cells	19 76 35

Highlights

- Easy operation
- Exact reagent dosing
- Tablet reagents with a guaranteed shelf life of 5/10 years
- High accuracy
- Continuous color scale



CHECKIT® Discs

Each CHECKIT® Disc contains a continuous color scale which makes it possible to achieve an exact color match between the color standard and the sample. These discs are specially manufactured in selected materials to maintain color-stability over a long period and guarantee reliable, reproducible measurement results.

Instruction manuals explaining the various stages of analysis are supplied with each disc.

Parameter	Range	Test Kit	Disc	Reagent(s)	Reagent P/N
Aluminum	0 - 0.3 mg/l Al	14 72 00	14 62 00	Aluminum No.1 Tablet	51 54 60 BT
				Aluminum No.2 Tablet	51 54 70 BT
				Combi-Pack: Aluminum No. 1 / Aluminum No. 2	51 76 01 BT
Ammonia	0 - 1 mg/l N	14 72 10	14 62 10	Ammonia No.1 Tablet	51 25 80 BT
				Ammonia No.2 Tablet	51 25 90 BT
				Combi-Pack: Ammonia No. 1 / Ammonia No. 2	51 76 11 BT
Ammonia	0 - 0.5 mg/l N	14 72 11	14 62 11	VARIO Ammonia Salicylate Reagent, F10	53 13 70
				VARIO Ammonia Cyanurate Reagent, F10	53 13 80
				VARIO Ammonia Nitrogen Set, F10	53 55 00
Bromine	0 - 5 mg/l Br	14 72 80	14 62 80	DPD No.1-RAPID*	51 13 10 BT
Chlorine free, combined, total	0 - 1 mg/l Cl ₂	14 70 10	14 60 10	DPD No.1-RAPID*	51 13 10 BT
				DPD No.3-RAPID*	51 12 90 BT
				DPD No.4-RAPID*	51 15 70 BT
Chlorine free, combined, total	0 - 2 mg/l Cl ₂	14 70 40	14 60 40	DPD No.1/3/4-RAPID*	See Above
Chlorine free, combined, total	0 - 4 mg/l Cl ₂	14 70 20	14 60 20	DPD No.1/3/4-RAPID*	See Above
Chlorine Free Total free, combined, total	0 - 3.5 mg/l Cl ₂	14 70 50	14 60 50	VARIO DPD Free Chlorine Reagent, F5	53 00 90
		14 70 51		VARIO DPD Total Chlorine Reagent, F5	53 00 80
		14 70 52			
Chlorine free, combined, total <i>With D55 Comparator</i>	0.02 - 0.3 mg/l Cl ₂	14 70 00	14 60 00	DPD No.1 Tablet	51 10 50 BT
				DPD No.3 Tablet	51 10 80 BT
				Combi-Pack: DPD No. 1 / DPD No. 3	51 77 11 BT
Chlorine, UHR (KI)	10 - 300 mg/l Cl ₂	14 70 30	14 60 30	Chlorine HR (KI) Acidifying GP	51 30 00 BT 51 54 80 BT
				Combi-Pack: Chlorine HR (KI) / Acidifying GP	51 77 21 BT
Chlorine dioxide <i>With D55 Comparator</i>	0.01 - 0.2 mg/l ClO ₂	14 73 30	14 63 30	DPD No. 1 Tablet	51 10 50 BT
				DPD Glycine Tablet	51 21 70 BT
				Combi-Pack: DPD No. 1 / Glycine	51 77 31 BT
Copper, free (Cu²⁺)	0 - 1 mg/l Cu	14 72 30	14 62 30	Copper / Zinc LR	51 26 20 BT
Copper HR free and total	0 - 5 mg/l Cu	14 74 30	14 64 30	Copper No. 1 Tablet	51 35 50 BT
				Copper No. 2 Tablet	51 35 60 BT
				Combi-Pack: Copper No. 1 / Copper No. 2	51 76 91 BT
Copper HR, free only	0 - 5 mg/l Cu	14 74 31	14 64 31	VARIO Copper Reagent, F10	53 03 00

* RAPID: fast dissolving tablet

Parameter	Range	Test Kit	Disc	Reagent(s)	Reagent P/N	
Copper LR free and total <i>With D55 Comparator</i>	0 - 1 mg/l Cu	14 74 40	14 64 40	Copper No. 1 Tablet	51 35 50 BT	
				Copper No. 2 Tablet	51 35 60 BT	
				Combi-Pack: Copper No. 1 / Copper No. 2	51 76 91 BT	
Copper LR, free only <i>With D55 Comparator</i>	0 - 1 mg/l Cu	14 74 41	14 64 41	VARIO Copper Reagent, F10	53 03 00	
DEHA	0 - 0.5 mg/l DEHA	14 73 70	14 63 70	DEHA Tablet	51 32 20 BT	
				DEHA solution	46 11 81	
				Plastic funnel with handle	47 10 07	
Fluoride	0.2 - 2 mg/l F	14 73 90	14 63 90	SPADNS Reagent Solution, 250 ml	46 74 80	
				Syringe, 2 ml	36 90 90	
Iron LR	0 - 1 mg/l Fe	14 72 20	14 62 20	IRON LR (Fe ²⁺ and Fe ³⁺) Tablet	51 53 70 BT	
				IRON (II) LR (Fe ²⁺) Tablet	51 54 20 BT	
Iron HR	1 - 10 mg/l Fe	14 73 20	14 63 20	Iron HR Tablet	51 53 80 BT	
Iron (TPTZ)	0 - 1.8 mg/l Fe	14 74 70	14 64 70	VARIO Iron TPTZ Reagent, F10	53 05 50	
Manganese LR	0.1 - 0.7 mg/l Mn	-----	14 64 10	VARIO Manganese LR Reagent Set, F10	53 50 90	
				Please order disc and reagent separately	VARIO Rochelle Salt Solution for samples with hardness values above 300 mg/l CaCO ₃	53 06 40
Manganese VLR	0.02 - 0.2 mg/l Mn	-----	14 64 20	VARIO Manganese LR Reagent Set, F10	53 50 90	
				Please order disc and reagent separately	VARIO Rochelle Salt Solution for samples with hardness values above 300 mg/l CaCO ₃	53 06 40
				<i>With D55 Comparator</i>		
Molybdate HR	0 - 100 mg/l MoO ₄	14 72 90	14 62 90	Molybdate No. 1 HR Tablet	51 30 60 BT	
				Molybdate No. 2 HR Tablet	51 30 70 BT	
				Combi-Pack: Molybdate No. 1 HR / No. 2 HR	51 76 31 BT	
Molybdate HR	50 - 500 mg/l MoO ₄	14 72 95	14 62 95	Molybdate No. 1 HR Tablet	51 30 60 BT	
				Molybdate No. 2 HR Tablet	51 30 70 BT	
				Combi-Pack: Molybdate No. 1 HR / No. 2 HR	51 76 31 BT	
Molybdate LR <i>With D55 Comparator</i>	0 - 10 mg/l MoO ₄	14 72 91	14 62 91	Molybdate No. 1 HR Tablet	51 30 60 BT	
				Molybdate No. 2 HR Tablet	51 30 70 BT	
				Combi-Pack: Molybdate No. 1 HR / No. 2 HR	51 76 31 BT	
Nitrate LR	0 - 1 mg/l N	-----	14 63 10	NITRITE LR	51 23 10 BT	
				NITRATE-Test tablets	50 28 10	
				NITRATE Test powder	46 52 30	
				NITRATE Test tube	36 62 20	
Please order disc and reagent separately						
Nitrite LR	0 - 0.5 mg/l N	14 73 00	14 63 00	Nitrite LR Tablet	51 23 10 BT	

Parameter	Range	Test Kit	Disc	Reagent(s)	Reagent P/N
Nitrite	0 - 0.3 mg/l N	14 73 01	14 63 01	VARIO Nitrite 3 Reagent, F10	53 09 80
Ozone (DPD) in the presence of chlorine	0 - 1.0 mg/l O ₃	14 72 70	14 62 70	DPD No. 4 Tablet Glycine Tablet	51 12 20 BT 51 21 70 BT
Ozone (DPD)	0 - 1.0 mg/l O ₃	14 72 75	14 62 75	DPD No. 4 Tablet	51 12 20 BT
pH	5.2 - 6.8 pH	14 71 10	14 61 10	Bromocresol Purple Tablet	51 17 30
	6.0 - 7.6 pH	14 71 20	14 61 20	Bromothymol Blue Tablet	51 16 40 BT
	6.5 - 8.4 pH	14 71 00	14 61 00	Phenol Red-RAPID* Tablet	51 17 90 BT
	4 - 10 pH	14 71 30	14 61 30	Universal pH Tablet	51 54 40
Phosphate HR	0 - 80 mg/l PO ₄	14 72 50	14 62 50	Phosphate HR Tablet	51 19 80
Phosphate LR	0 - 4 mg/l PO ₄	14 72 40	14 62 40	Phosphate No. 1 LR Tablet Phosphate No. 2 LR Tablet	51 30 40 51 30 50 BT
				Combi-Pack: Phosphate No. 1 LR / No. 2 LR	51 76 51 BT
Phosphate, Ortho	0 - 2.5 mg/l PO ₄	14 74 80	14 64 80	VARIO Phosphate 3 Reagent, F10	51 15 50
Silica LR	0.25 - 4 mg/l SiO ₂	14 73 50	14 63 50	Silica No. 1 Tablet Silica No. 2 Tablet	51 31 30 51 31 40
				Combi-Pack: Silica No. 1 / No. 2	51 76 71
				Silica PR Tablet	51 31 50
Silica HR VARIO	0 - 100 mg/l SiO ₂	14 73 51	14 63 51	VARIO Silica HR Reagent Set, F10	53 57 00
Silica VLR	0 - 1 mg/l SiO ₂	14 73 60	14 63 60	Silica No. 1 Tablet Silica No. 2 Tablet	51 31 30 51 31 40
				Combi-Pack: Silica No. 1 / No. 2	51 76 71
				Silica PR Tablet	51 31 50
Sodium Hypochlorite	2 - 18 %	14 74 90	14 64 90	Chlorine HR (KI) Tablet Acidifying GP	51 30 00 BT 51 54 80 BT
				Combi-Pack: Chlorine HR (KI) / Acidifying GP Dilution set for sample preparation	51 77 21 BT 41 44 70
Sulfite LR	0.5 - 10 mg/l SO ₃ ²⁻	14 73 80	14 63 80	SULFITE LR	51 80 20 BT
Total Alkalinity	20 - 240 mg/l CaCO ₃	14 74 50	14 64 50	ALKACHECK	51 32 00 BT
Zinc LR	0 - 1 mg/l Zn <i>required in cases of high residual chlorine:</i>	14 73 40	14 63 40	Copper/Zinc LR Tablet EDTA Tablet DECHLOR Tablet	51 26 20 BT 51 23 90 BT 51 23 50 BT
				Combi-Pack: Copper / Zinc LR, EDTA & Dechlor	51 79 20 BT

* RAPID: fast dissolving tablet

EZ Mix Primary Chlorine Standard Kit

Creating a Primary Chlorine Standard has never been easier! This self contained kit will allow preparation of a 1.5 mg/l NIST traceable primary chlorine standard without need for complicated dilutions or the additional use of pipettes or glassware.

Simply break the double ended glass ampule filled with primary chlorine standard over the supplied and precisely measured bottle of Zero Chlorine Demand Water. Invert the bottle a few times to evenly distribute the standard solution, and pour it into your sample cell. Add one of our DPD Free Chlorine Powder Packs and insert the sample cell into your instrument for testing.

This kit is ideal for conforming with US EPA Method 334.0



CHECKIT® Comparator

Ordering Information

Item	P/N
EZ Mix Primary Chlorine Standard Kit	36 61 60



Digital Titrator Cartridges

Available for a wide variety of parameters, the newly re-designed Digital Titrator Cartridges are ideal for performing titrations in the field -- no need for additional glassware!

Ordering Information

Please see page 60



Membrane Filter Set

Before photometric measurements can be performed it is important that all turbid materials are removed from the sample to avoid excess scattered light from interfering with the reading.

For certain tests (Iron and Manganese for example) a membrane filter must be used to differentiate samples in terms of dissolved and total substances.

Ordering Information

Item	P/N
Membrane Filter Set includes 25 x 0.45 µm membrane filters and two 20 ml syringes	36 61 50

Comparator 2000+ System



Ordering Information

Item	P/N
Lovibond® Comparator 2000*	14 20 00
Nesslerizer 2150 Body (113 mm path length)	32 21 50
Nesslerizer 2150 Upgrade Kit Includes Nesslerizer 2150 Body and AF 306/P (113 mm tubes)	17 21 60
Nesslerizer 2150 Upgrade Kit 2 Includes Nesslerizer 2150 Body, AF 306/P (113 mm tubes) & Nessler Daylight	17 21 75
Nesslerizer 2250 Body (250 mm path length)	32 22 50
Nesslerizer 2250 Upgrade Kit Includes Nesslerizer 2250 Body and DB 420 (250 mm tubes).	17 21 70
Nesslerizer 2250 Upgrade Kit 2 Includes Nesslerizer 2250 Body, DB 420 (250 mm tubes) & Nessler Daylight	17 21 65
Sample Cells, 13.5 mm, glass 5 pack, calibrated at 2-12 ml, with lids	35 42 43
Sample Cells, 13.5 mm, plastic 5 pack, 10 ml volume, frosted on 2 sides, with lids	14 55 05
Sample Cells, 13.5 mm, plastic 10 pack, 10 ml volume, frosted on 2 sides, with lids	14 55 00
Sample Cells, 13.5 mm, plastic 100 pack, 10 ml volume, frosted on 2 sides, with lids	14 55 10
Sample Cell, 40 mm, glass single cell, calibrated at 20 ml	60 68 90
DB 420: Set of 2 Nessler Tubes, 250 mm path length includes plungers, glass	35 42 00
AF 306/P: Set of 2 Nessler Tubes, 113 mm path length includes plungers, glass	35 30 80
Daylight Unit for Comparator 2000*	17 10 10
Nessler Daylight 2000*	17 10 20
Portable Daylight Unit	14 20 50
Nessler Stand	17 21 80
Spare Bulb, Daylight Illuminator	12 41 00
Spare Bulb, Portable Daylight Unit	33 22 79
Spare Bulb, Nessler Illuminator	12 41 00
Tablet Crusher	36 41 09
Cleaning Cloth for Sample Cells	19 76 35

Comparator 2000+

Disc Certification

All discs with permanent glass standards are guaranteed to be fade-free and comply with international standards (ISO 7393-2).

If you require additional documentation for regulatory or internal quality control purposes, the following options are available:

Ordering Information

Item	P/N
Certificate of Conformity For a new disc -- must be purchased at the same time as disc	99 98 00
Certificate of Conformity For a used disc	99 98 10
Calibration Certificate For a new disc -- must be purchased at the same time as disc	99 98 20
Calibration Certificate For a used disc	99 98 30



Water Quality Discs

We offer a wide variety of water quality discs for use with the Comparator 2000+ System.

For a complete list of available discs, please visit:
www.lovibond.us/comparator2000

Platinum-Cobalt / Hazen / APHA Color (ASTM D 1209)

A method for measuring the color of potable water in terms of an easily reproducible color standard is essential to water engineers responsible for the distribution of supplies for public consumption. Color determinations are useful for detecting any irregular contamination of the supply due to natural disasters (floodwaters, earthquakes, etc.), checking the efficiency of the filter beds, of the decolorizing treatments and maintaining a standard clarity. Turbid or colored waters are unappetizing, and even slight variations in the color of the supply result in complaints from consumers.

The American Public Health Association in "Standard Methods for the Examination of Water and Wastewater", 1989, specifies that the color of water shall be expressed by comparison with a series of solutions containing known amounts of platinum chloride and cobalt chloride. These solutions are known as "Hazen Color Standards", and are adopted in British Standard 2690: 1970 Part 9, British Standard 6068: 1968 Section 2.22 and International Standard ISO 2211: 1973. They are also used for non-aqueous applications in ASTM D1209-52 and D1045-58.

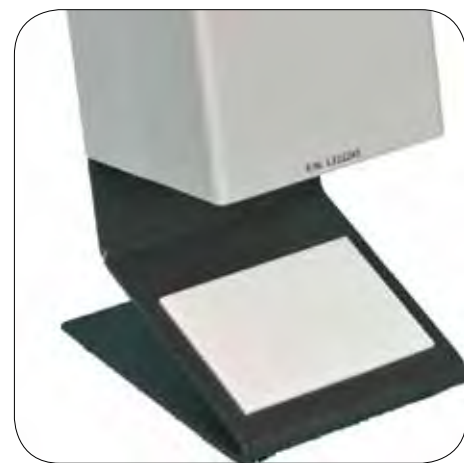
These Hazen Color Standards have been matched with Lovibond® glass to produce permanent color standards, and discs containing nine color standards exactly matching the Hazen standards are available for use with the Comparator 2000+ handheld comparator and nessler systems.

Designed for measuring unsaturated samples that are below the sensitivity of a normal, hand-held comparator system, the Nesslerizer System employs longer pathlengths that make it possible to accurately match samples that produce very pale colors visually.

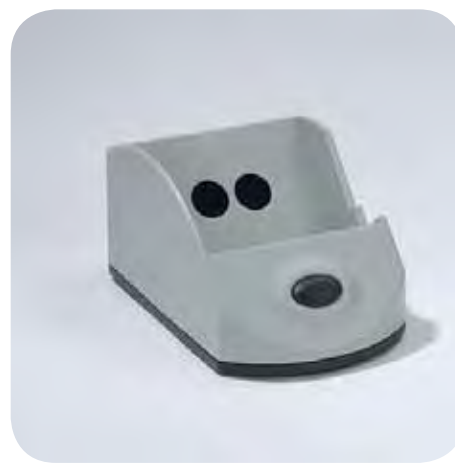
The built-in magnifying prism allows the user to easily view the glass color disc standard and the sample to be matched side-by-side. Glass plungers eliminate distracting meniscus curvatures.

Correct lighting conditions are essential for accurate color comparison. The lighting units provide a constant and stable light using a tungsten halogen lamp and a calibrated color temperature correction filter. This guarantees correct lighting conditions 24 hours a day and under all ambient light conditions.

Lighting Sources



Nessler Stand



Lighting Unit



Portable Lighting Unit (TK 102)

We recommend the use of a light source when visually matching colors for optimal results. Correct lighting conditions are essential for accurate color comparison. Northern Daylight (or Southern Daylight in the southern hemisphere) is preferred because it maintains a more consistent color temperature over the course of the day, unlike direct sunlight where the color temperature varies according to the time of day. However, because ideal lighting conditions are not always available naturally, we have developed a line of lighting units to provide a standardized, consistent light source that simulates Northern Daylight.

By using one of our standardized lighting sources, reliable test results can be obtained at all times, and under all ambient light conditions. Lovibond® light sources provide a constant and stable light using a tungsten halogen lamp and a calibrated color temperature correction filter. This guarantees correct lighting conditions 24 hours a day.

The following kits contain everything users need to measure the Platinum Cobalt (APHA) color scale including sample tubes/cells, color discs and light sources.

AF 328, 0 - 70 mg Pt/l

Contains one each of the following:

- Nesslerizer 2250 Body (250 mm path length)
- Nesslerizer Daylight 2000+
- Nessler Stand
- DB 420: Set of 2 Nessler Tubes, 250 mm path length
- Hazen discs
 - CAA, 0 - 30 mg Pt/l
 - CAB, 30 - 70 mg Pt/l

AF 325 Hazen, 10 - 250 mg Pt/l

Contains one each of the following:

- Nesslerizer 2150 Body (113 mm path length)
- Nesslerizer Daylight 2000+
- Nessler Stand
- AF 306/P: Set of 2 Nessler Tubes, 113 mm path length
- Hazen discs
 - NSH, 10 - 90 mg Pt/l
 - NSB, 70 - 250 mg Pt/l

AF 329, 0 - 250 mg Pt/l

Contains one each of the following:

- Nesslerizer 2150 Body (113 mm path length)
- Nesslerizer 2250 Body (250 mm path length)
- Nesslerizer Daylight 2000+
- Nessler Stand
- AF 306/P: Set of 2 Nessler Tubes, 113 mm path length
- DB 420: Set of 2 Nessler Tubes, 250 mm path length
- Hazen discs
 - CAA, 0 - 30 mg Pt/l
 - CAB, 30 - 70 mg Pt/l
 - NSB, 70 - 250 mg Pt/l

AF 326 Hazen, 0 - 500 mg Pt/l

Contains the following:

- Comparator 2000+
- Nesslerizer 2250 Body (250 mm path length)
- Nesslerizer 2150 Body (113 mm path length)
- Nesslerizer Daylight 2000+
- Comparator 2000+ Daylight Unit
- Nessler Stand
- AF 306/P: Set of 2 Nessler Tubes, 113 mm path length
- DB 420: Set of 2 Nessler Tubes, 250 mm path length
- 2 x 40 mm Glass Tubes
- Hazen discs
 - CAA, 0 - 30 mg Pt/l
 - CAB, 30 - 70 mg Pt/l
 - NSH, 10 - 90 mg Pt/l
 - NSB, 70 - 250 mg Pt/l
 - 4/28, 50 - 500 mg Pt/l

Ordering Information

Item	P/N
AF 328 (0 - 70 Pt. Co. Units)	43 32 80
AF 325 (10 - 250 Pt. Co. Units)	43 32 50
AF 329 (0 - 250 Pt. Co. Units)	43 32 90
AF 326 (0 - 500 Pt. Co. Units)	43 32 60

APHA Color Discs

Item	Instrument	Path length	P/N
CAA Hazen Scale Disc, 0-30 0 / 2.5 / 5 / 7.5 / 10 / 15 / 20 / 25 / 30	Nesslerizer 2250	250 mm	28 41 50
CAB Hazen Scale Disc, 30-70 30 / 35 / 40 / 45 / 50 / 55 / 60 / 65 / 70	Nesslerizer 2250	250 mm	28 41 60
NSH Hazen Scale Disc, 10-90 10 / 20 / 30 / 40 / 50 / 60 / 70 / 80 / 90	Nesslerizer 2150	113 mm	28 41 70
NSB Hazen Scale Disc, 70-250 70 / 85 / 100 / 125 / 150 / 175 / 200 / 225 / 250	Nesslerizer 2150	113 mm	28 41 20
4/28 Hazen Scale Disc, 50-500 50 / 75 / 100 / 150 / 200 / 250 / 300 / 400 / 500	Comparator 2000+	40 mm	24 28 01

KATHON™ Test Kit

The KATHON™ Microbiocide Test Kit enables the rapid and accurate measurement of active microbiocide in a range of industrial cooling water applications. The test can be performed at the cooling tower, eliminating the requirement to return the sample to a laboratory for evaluation. The kit has been designed to be used by inexperienced operators using the simple step-by-step instructions.

KATHON™ is a versatile preservative that is the preferred solution for many different types of material preservation applications. The product provides excellent broad-spectrum activity against bacteria, yeasts and molds. KATHON™ is effective over a wide pH range, and is also rapidly biodegradable and non-persistent in the environment. In addition, it does not contain or release formaldehyde.

For more information the use of KATHON™ and its applications, please visit www.dowmicrobialcontrol.com.



EASY TO USE

- No need to take samples back to the lab -- Perform the test out in the field!
- Designed with the inexperienced operator in mind, the kit comes complete with step-by-step instructions.

ACCURATE RESULTS - FAST!

- Test requires 6 simple steps and is complete in 10 minutes.
- No interferences from cooling water additives
- Determine concentrations using visual colorimetric methods.

OPTIMIZE TREATMENT

- Test a range of 0-7.5 ppm of the active ingredient without the need to dilute the sample.
- Easily confirm dose amounts and monitor residual concentrations.
- Measure within 0.75 ppm of the active ingredient.



Ordering Information

Item	P/N
KATHON™ Test Kit Includes Reagents for 50 tests, Color Scale Disc, 2 Sample cells, Instruction Manual and Carrying Case	FG-K29497-KW
KATHON Reagent Set Reagents for 50 tests and 2 sample cells	AS-K28101-KW

Designed specifically for use with KATHON™ preservatives manufactured by The Dow Chemical Company. KATHON™ is a Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow.

Non-Oxidizing Biocide Test Kits

Non-oxidizing biocides are used across industry to control microbiological activity in a wide range of water systems, often in rotation with oxidizing biocides. Biocidal performance is concentration dependent, so it is essential to monitor the activity levels closely in any system to ensure microbiological control.

The non-oxidizing biocide test kits are based on colorimetric or titrimetric procedures and are designed for use by non-technical persons as a site-based aid. Accurate biocide levels can be measured in minutes to ensure continued system control.

- Control microbiological activity
- Measure biocide levels in minutes
- Designed for use by non-technical personnel
- Ensure environmental bleed concentrations are met

Parameter	Range	Test Kit P/N	Reagent(s)	# of Tests	Reagent P/N
Bronopol Test Kit	0 - 50 mg/l	56K001101	Bronopol Reagent Set	50 Tests	56R001150
DBNPA Test Kit	5 - 20 mg/l	56K001201	DPNPA Reagent Set	50 Tests	56R001250
Isothiazoline Test Kit	0 - 7.5 mg/l	56K001401	Isothiazoline Reagent Set	50 Tests	56R001450
MBTC Test Kit	0 - 5 mg/l	56K001501	MBTC Reagent Set	50 Tests	56R001550
THPS Kit	0 - 100 mg/l	56K001601	THPS Reagent Set	50 Tests	56R001650
Quats/ Polyquat/ Amine (Lonza Biocides)	0 - 320 mg/l Bardac 22 0 - 80 mg/l Bardac PQ 0 - 160 mg/l Lonzacab 12.100	56K001701	Single use kit -- supplied with reagents	100+	Reorder as complete test kit
Bardac 22 (Lonza Biocides)	0 - 15 mg/l	56K001801	Single use kit -- supplied with reagents	50	Reorder as complete test kit

Arsenic Test Kit

The Arsenic Test Kit is able to accurately detect very low levels of arsenic, and can be used to determine the presence of arsenic in drinking water. The kit includes enough materials to perform 100 tests.

Range: 0-0.005-0.01-0.025-0.05-0.1-0.25-0.5 mg/l



- Meets World Health Organization (WHO) requirements for drinking water. This Test Kit is able to detect levels as low as 0.005mg/l arsenic.
- Does not use highly toxic lead acetate for sulfide removal. Instead, the removal of interfering sulfide ions is integrated into the test procedure.
- Acid Chemistries necessary for the procedure are in solid form in order to avoid potential skin irritation.
- The plastic reaction bottle is safe and convenient for on-site testing purposes.
- During the test procedure, the developing arsine gas is tightly sealed inside the reaction bottle. Unable to escape, it cannot harm the user.

Ordering Information

Item	P/N
Arsenic Test Kit	40 07 00

Legionella Detection Test Kits

Legionella is a bacteria which can cause a pneumonia-like disease called "Legionnaires' Disease". Legionnaires' Disease is fatal in approximately 15-20% of people infected with the bacteria. Infection occurs when the bacteria is inhaled from aerosols of contaminated water.

Legionella have been found in a wide range of systems including hot and cold water systems (both large systems serving public buildings and small systems in people's homes), cooling towers and some forms of air conditioning systems, on-board ships, airplanes and trains, water fountains, food misters, whirlpool spas and even in car washes.

Within the *Legionella* genus there are approximately 50 different species. Several of these can cause infections in people, however worldwide over 90% of infections are caused by a single species: *Legionella pneumophila*. The particular "serogroup 1" of pneumophila causes the vast majority (>80%) of all cases, and is implicated in virtually all major outbreaks.

Our *Legionella* Test Kits use an immunochromatographic assay to detect the presence of cell surface antigens from Legionella bacteria in a sample. This rapid test is a very useful addition to periodic laboratory culture tests for *Legionella*. It should not be used as the sole method for assessing the presence of *Legionella*. If results with this rapid test indicate the presence of *Legionella*, then confirmation with a laboratory culture test is essential.

With all of the different test kits, a sample is taken, prepared according to the specific test procedure, and the sample is dispensed onto a test strip. The presence of antigen causes the "Test Line" to turn red in color. A "Control Line" is included which always turns red on successful completion of the test. This test can provide a rapid indication of the presence of *Legionella pneumophila* serogroup 1, the most commonly recorded cause of Legionnaires Disease.

These test kits can be used in a wide variety of sectors including: education, food and beverage, hotels and spas, shipping, pools and whirlpool spas, offshore oil and gas, conventional and nuclear energy, hospitals, nursing homes and many more.*

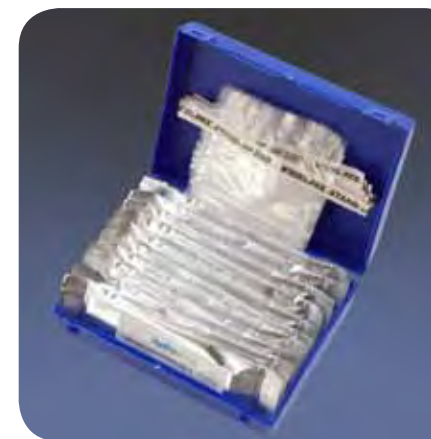


Why It Works

- This test is fast, easy to use, accurate and can be used anywhere, removing the need to transport a sample to a lab. Effectively, you carry the expertise of the lab in your pocket.
- While a positive result is bad news, it is better to know immediately so you can take remedial action, prevent infection, protect staff and clients, and consequently your reputation and business.
- Imagine if your system was infected and you did not know. Without a rapid test, your uncertainty will continue for 10-14 days waiting for laboratory results. During this time you may continue to expose your staff/public or have to shut down facilities to prevent exposure.
- Once you have taken remedial action, you can use our test to check the impact. Our test will let you know in 25 minutes if there is still a problem.
- Effective remedial action should completely remove all traces of bacteria from your system within 24 hours – giving a negative test result on the test.
- By detecting antigen, rather than relying on culturable cells, our test may give a better warning of *Legionella* growth within a system.

Specifications

Bacteria Detected	<i>Legionella pneumophila</i> serogroup 1
Detection Method	Lateral flow immunochromatographic assay
Test Development Time	25 minutes
Sample Prep Time	2 - 10 minutes
Shelf Life	18 months from manufacture (stored at room temperature (<30°C) in original packaging)
Specificity	Tested against a wide range of water borne bacteria, including <i>Acinetobacter calcoaceticus</i> , <i>Aeromonas hydrophila</i> subsp. <i>hydrophila</i> , <i>Bacillus subtilis</i> , <i>Burkholderia cepacia</i> , <i>Citrobacter freundii</i> , <i>Citrobacter koseri</i> , <i>Escherichia coli</i> , <i>Enterobacter cloacae</i> , <i>Klebsiella oxytoca</i> , <i>Pseudomonas aeruginosa</i> , <i>Pseudomonas fluorescens</i> , <i>Pseudomonas putida</i> , <i>Pseudomonas stutzeri</i> , <i>Ralstonia pickettii</i> , <i>Raoultella terrigena</i> , <i>Streptococcus pyrogenes</i> , <i>Yersinia ruckeri</i> . No cross reactions observed at concentrations $\leq 10^9$ CFU/L. <i>Staphylococcus aureus</i> has been observed to cross react with the test at concentrations $> 10^8$ CFU/L. <i>Legionella pneumophila</i> serogroups 4 & 7 cross react with the test at concentrations $> 6 \times 10^9$ CFU/L.
	The test does not react with any other <i>L. pneumophila</i> serogroups or <i>L.</i> species tested.
Biocides	The product has been tested with a range of common biocides and bio dispersants used in Legionella control, at their normal maximum operating concentration. Active ingredients tested include: glutaraldehyde, didecyl-dimethylammonium chloride, isothiazoles, dibromonitropropion amide, ionic and non-ionic surfactants. The test gives a false positive if used with polymeric biguanide or THPS.



Field Test Kit - 10 Tests

The Legionella Field Test Kit is the most basic of the Legionella Detection test kits. The test is easy and fast -- no reagents or interpretation of results required!

With results in 25 minutes, the test allows for immediate understanding and response to the water conditions. Users simply collect a water sample in the provided collection bag, and using the provided exact volume disposable pipet, dispense 100 μ L of sample onto the test strip. After the required reaction time, the test line will turn red if results are positive.

Ordering Information

Item	P/N
Single Test Kit (Filtration), 1 Test	56B006601
Field Test Kit, 10 Tests	56B006001
Systems (Filtration) Test Kit, 5 Tests	56B006101
Swab (Biofilm) Test Kit, 5 Tests	56B006401
Enterprise Test Kit, 4 Tests	56B006501

Systems (Filtration) Test Kit - 5 Tests

The *Legionella* System Test Kit is for detecting *Legionella* in a water sample -- it is ideal for on-line and a variety of industrial applications.

This test procedure utilizes hollow fiber filtration modules which attach directly to the provided sample point fittings (both a 1/2" and 3/4" female threaded fittings are provided). The filtered sample increases the sensitivity of the test. The pre-filled syringes contain the required recovery buffer, so there is no need to measure or dilute solutions.

This version of the test kit is also available as a Single Test version.



Swab (Biofilm) Test Kit - 5 Tests

Within a water system *Legionella* usually grow within biofilm (slime) found on the insides of pipe work, shower heads, cooling tower packing, or water tanks. Bacteria found in the planktonic phase (i.e. suspended in the water itself) are usually an indicator of colonization of the biofilm.

Since a clean water sample does not equate to a clean system (proliferation of *Legionella* is greater in a biofilm than in water), this kit can be used to pinpoint the contamination in a system or to demonstrate cleanliness of an area after a targeted cleaning.

Use this kit to find *Legionella* in their breeding ground - this very selective test can detect legionella even in samples with very high background flora.

Enterprise Test Kit - 4 Tests

The Enterprise Test Kit offers users a combination of the Swab Test Kit and the System Test Kit.

This version of our test kits is ideal for first time users trying to determine which procedure best fits their processes, or for low-volume users that require both swab and filtration type tests.

With results in as little as 25 minutes, the test allows for immediate understanding and response to the water conditions. Regular use will increase confidence in your *Legionella* control procedures and reduce risk of outbreaks and litigation!

**This 25 minute test enables routine screening of industrial and potable water systems for the presence of Legionella, in between (and not replacing) mandatory laboratory culture tests.*



PHOTOMETRY



MD 100

COD Set-up

RD 125

IRiM

MD 600

SpectroDirect

MD 100 Single Parameter Colorimeters



The MD 100 Series is the newest addition to the Lovibond® Tintometer® line of single parameter colorimeters. These rugged, waterproof, single parameter colorimeters are ideal for laboratory and field testing.

Available for a wide variety of parameters, these instruments feature a large, backlit display, a real time clock, automatic data logging as well as the ability to export data to a computer using the IRiM (data transfer device).

The tests are conducted using either Tablet, Powder Pack or Liquid style reagents. Choose the reagent style that works best for you!

Highlights

- Scroll-driven menu system
- Auto-off
- Automatic data storage with time and date stamp
- Easy to read, backlit display
- One time zero function
- Waterproof^{*)}

^{*)} as defined in IP 68, 1 hour at 0.1 meter

Wide Variety of Parameters

- Most instruments in the MD 100 series offer multiple ranges and methods.
- Many instruments have the flexibility to use our Powder Pack™, tablet and/or liquid reagents.

Ergonomic Design

- Angled, ergonomic design for easy bench top or hand-held use.
- Waterproof.

User Calibration Mode

- Allows user to calibrate instrument to any government or organizational standard (for example N.I.S.T or ISO)
- If the user is testing in a very specific range, resolution can be improved.
- Can be used to account for any interferences that are known to be present in the sample.

Automatic Data Storage

- 16 point internal data storage with time and date stamp.
- Ability to export data to a PC using the IRiM (infrared data transfer module) accessory.

Specifications

Interfaces	Infrared interface for test data transfer ¹
Optics	LEDs, interference filters (IF) and photo sensor in transparent sample chamber. Depending on the version, up to 3 different interference filters are used. Wavelength specifications of interference filters: 430 nm $\Delta\lambda = 5$ nm 530 nm $\Delta\lambda = 5$ nm 560 nm $\Delta\lambda = 5$ nm 580 nm $\Delta\lambda = 5$ nm 610 nm $\Delta\lambda = 6$ nm 660 nm $\Delta\lambda = 5$ nm
Wavelength Accuracy	± 1 nm
Photometric Accuracy	3% FS (T = 20°C – 25°C)
Photometric Resolution	0.01
Power Supply	4 x AAA batteries capacity approx. 17 hours or 5000 tests
Auto - OFF	After 20 minutes
Display	Backlit LCD (on keypress)
Storage	Internal ring memory for 16 data sets
Interfaces	Infrared interface for test data transfer
Additional feature	Real time clock and date
Calibration	factory calibration and user calibration. Table to factory calibration
Dimensions	155 x 75 x 35 mm (L x W x H)
Weight	basic unit approx. 260 g
Environmental conditions	temperature: 5 – 40 °C rel. humidity: 30 – 90% (non-condensing)
Conformity	CE

Delivery Content

- Instrument in carrying case
- 4 AAA batteries
- 3 Round vials (glass) with lid
- 1 stirring rod & 1 brush
- Specified Reagents*
- Warranty Information
- Certificate of Conformity
- Instruction Manual

* COD and Fluoride instruments are supplied without reagents

Ordering Information

Item	P/N
Set of 12 round vials with lid Height 48 mm, Ø 24 mm, glass	19 76 20
Set of 5 round vials with lid Height 48 mm, Ø 24 mm, glass	19 76 29
Set of 10 round vials with lid Height 90 mm, Ø 16 mm, glass	19 76 65
Adapter for round vials ø 16 mm	19 80 21 90
Set of 12 plastic vials (PC), with lid "Multi"-Type 2, Ø 10 mm	19 76 00
Vial stand for 6 round vials Ø 24 mm, acrylic glass	41 89 51
Vial stand for 10 vials (Ø 16 mm or □ 13.5 mm), acrylic glass	41 89 57
Mixing cylinder, 25 ml, with stopper required accessory for molybdenum LR test	19 80 26 50
Membrane filter set for use when preparing samples, 25 membrane filters, 0.45 µm, 2 syringes 20 ml	36 61 50
Cleaning cloth for vials	19 76 35
Set of 12 sealing rings for round vial ø 24 mm	19 76 26
Measuring beaker, volume 100 ml	38 48 01
Plastic funnel with handle	47 10 07
Tablet Crusher, 13 cm length	36 41 00
Tablet Crusher, 10 cm length	36 41 09
IRiM - Data Transfer Module	21 40 50
Secondary Reference Standard Kit Confirms the standards of Zero, 0.20, and 1.0 mg/l Cl ₂ For use with the Chlorine 1 and Chlorine 3 instruments.	27 56 60
EZ Mix Primary Chlorine Standard Kit Confirms the value of 1.5 mg/l For use with the Chlorine 1, Chlorine 2 and Chlorine 3 instruments.	36 61 60

¹available option: IRiM

*tested with standard solutions



Parameter	Range	Method	Reagents	Reagent P/N	Instrument P/N
Absorbance	See page 30 for details				
Aluminum	0.01 - 0.3 mg/l Al	Eriochrome cyanine R ²	Combi-Pack: Aluminum No. 1 / Aluminum No. 2	51 76 01 BT	27 62 00
	0.01 - 0.25 mg/l Al	Eriochrome cyanine R ²	VARIO Aluminum Reagent Set	53 50 00	27 62 05
Ammonia	0.02 - 1.0 mg/l N	Indophenol blue	Combi-Pack: Ammonia No. 1 / Ammonia No. 2	51 76 11 BT	27 60 60
	0.01 - 0.8 mg/l N	Salicylate	VARIO Ammonia Reagent Set, F10	53 55 00	27 60 65
Ammonia, Free	0.01 - 0.5 mg/l N	Indophenol	VARIO Free Ammonia Reagent Set, F10	53 58 00	27 60 70
Chlorine 1 (Free & Total)	0.02 - 2.0 mg/l Cl ₂	DPD	Free Chlorine: VARIO DPD Free Chlorine Reagent, F10 Total Chlorine: VARIO DPD Total Chlorine Reagent, F10	53 01 00	27 60 10
	0.1 - 8.0 mg/l Cl ₂	DPD		53 11 20	
In addition to the standard accessories, this instrument is also supplied with 2 x Type 2 Multi-Vials					
Chlorine 2 (Free & Total)	0.01 - 4 mg/l Cl ₂	DPD	Chlorine Reagent Set	47 10 56	27 60 05
	0.02 - 6.0 mg/l Cl ₂	DPD	Combi-Pack: DPD No. 1 / DPD No. 3	51 77 11 BT	27 60 00
	0.1 - 10 mg/l Cl ₂	DPD	Combi-Pack: DPD No. 1 HR / DPD No. 3 HR	51 77 91 BT	
Chlorine Duo (Free & Total)	0.02 - 6.0 mg/l Cl ₂	DPD	Combi-Pack: DPD No. 1 / DPD No. 3	51 77 11 BT	27 60 20
	0.02 - 2.0 mg/l Cl ₂	DPD	Free Chlorine: VARIO DPD Free Chlorine Reagent, F10 Total Chlorine: VARIO DPD Total Chlorine Reagent, F10	53 01 00	27 60 25
	0.1 - 8.0 mg/l Cl ₂	DPD		53 01 20	
	0.1 - 10 mg/l Cl ₂	DPD	Combi-Pack: DPD No. 1 HR / DPD No. 3 HR	51 77 91 BT	
Chlorine HR (Total)	5 - 200 mg/l Cl ₂	Potassium Iodide	Combi-Pack: Chlorine HR (KI) / Acidifying GP	51 77 21 BT	27 61 70
This instrument is supplied with 3 x 16 mm sample cells and tube adapter.					
Chlorine & pH 2 in 1 Version	0.02 - 2.0 mg/l Cl ₂	DPD	Free Chlorine: VARIO DPD Free Chlorine Reagent, F10 Total Chlorine: VARIO DPD Total Chlorine Reagent, F10	53 01 00	27 80 30
	0.1 - 8.0 mg/l Cl ₂	DPD		53 01 20	
	6.5 - 8.4 pH	Phenol Red	Phenol Red Photometer Tablets	51 17 70 BT	
Chlorine Dioxide	0.02 - 3.8 mg/l ClO ₂	DPD	VARIO DPD Free Chlorine Reagent, F10	51 01 00	27 60 35
	0.02 - 11 mg/l ClO ₂	DPD	Combi-Pack: DPD No. 1 / Glycine	51 77 31 BT	27 60 30
COD	0 - 150 mg/l O ₂	Dichromate / H ₂ SO ₄	VARIO LR COD Tube Tests (25 pack)	2 42 07 20	27 61 20
			VARIO LR COD Tube Tests (150 pack)	2 42 07 25	
			VARIO LR COD Tube Tests, Hg-Free (25 pack)	2 42 07 10	
	0 - 1500 mg/l O ₂	Dichromate / H ₂ SO ₄	VARIO MR COD Tube Tests (25 pack)	2 42 07 21	
			VARIO MR COD Tube Tests (150 pack)	2 42 07 26	
			VARIO MR COD Tube Tests, Hg-Free (25 pack)	2 42 07 11	
	0 - 15000 mg/l O ₂	Dichromate / H ₂ SO ₄	VARIO MR COD Tube Tests, Hg-Free (150 pack)	2 42 07 16	
			VARIO HR COD Tube Tests (25 pack)	2 42 07 22	
			VARIO HR COD Tube Tests (150 pack)	2 42 07 27	
		VARIO HR COD Tube Tests, Hg-Free (25 pack)	2 42 07 12		
This instrument is supplied with a 16 mm tube adapter; Please order reagents separately.					
Required Accessory:			RD 125 Reactor	2 41 89 40	
Copper	0.05 - 5.0 mg/l Cu	Biquinoline	Combi-Pack: Copper No. 1 / Copper No. 2	51 76 91 BT	27 60 80
	0.05 - 5.0 mg/l Cu	Bicinchoninate	VARIO Copper Reagent, F10	53 03 00	27 60 85
Fluoride	0.05 - 2.0 mg/l F ⁻	SPADNS	SPADNS Reagent, 250 ml	46 74 81	27 60 90
			SPADNS Reagent, 500 ml	46 74 82	
This instrument is supplied without reagents; Please order reagent and standard separately.					
Required Accessory:			Fluoride Standard, 30 ml	20 56 30	

Parameter	Range	Method	Reagents	Reagent P/N	Instrument P/N	
Hardness, Total	2 - 50 mg/l CaCO ₃ 20 - 500 mg/l CaCO ₃ (by dilution)	Metallphthalein	HARDCHECK P Tablets	51 56 60 BT	27 61 90	
Hazen (APHA)	0 - 500 mg/l Pt-Co	Platinum Cobalt (APHA)	No Reagents Required		27 61 60	
Iron	0.02 - 1.0 mg/l Fe	PPST	Iron LR (Fe ²⁺ and Fe ³⁺) Tablet	51 53 70 BT	27 60 50	
	0.02 - 1.8 mg/l Fe	TPTZ	VARIO Iron TPTZ Reagent, F10	53 05 50	27 60 55	
	0.02 - 3.0 mg/l Fe	1, 10-Phenanthroline	VARIO Ferro Reagent, F10	53 05 60	27 60 56	
Manganese	0.2 - 4.0 mg/l Mn	Formaloxime	Combi-Pack: Manganese No. 1 LR / No. 2 LR	51 76 21 BT	27 61 00	
	0.01 - 0.7 mg/l Mn	PAN	VARIO LR Manganese Reagent Set, F10 VARIO Rochelle Salt Solution, 30 ml (for seawater)	53 50 90 53 06 40	27 61 05	
	0.1 - 18 mg/l Mn	Periodate Oxidation	VARIO HR Manganese Reagent Set, F10	53 51 00	27 61 06	
Molybdate	0.03 - 3.0 mg/l Mo	Mercaptoacetic Acid	VARIO LR Molybdate Reagent Set, F20 Graduated Mixing Cylinder, Glass w/ stopper, 25 ml	53 54 50	27 61 40	
	0.3 - 40 mg/l Mo			VARIO HR Molybdate Reagent Set, F10	53 53 00	27 61 41
	0.6 - 30 mg/l Mo			Combi-Pack: Molybdate No. 1 HR / No. 2 HR	51 76 31 BT	27 61 42
Monochloramines	0.04 - 4.5 mg/l Cl ₂	Indophenol	VARIO Monochlor F Reagent, F10	53 18 10	27 60 70	
Phosphate	0.05 - 4.0 mg/l PO ₄	Phosphomolybdic Acid	Combi-Pack: Phosphate No. 1 LR / No. 2 LR	5176 51 BT	27 60 40	
	0.06 - 2.5 mg/l PO ₄	Ascorbic Acid	VARIO Phosphate 3 Reagent, F10	53 15 50	27 60 45	
Silica	0.05 - 4.0 mg/l SiO ₂	Silicomolybdate	Combi-Pack: Silica No. 1 / No. 2 Silica PR Tablet (needed in the presence of phosphate)	51 76 71 51 31 50	27 61 10	
	0.1 - 1.6 mg/l SiO ₂	Heteropoly Blue	VARIO LR Silica Reagent Set, F10	53 56 90	27 61 15	
	1 - 90 mg/l SiO ₂	Silicomolybdate	VARIO HR Silica Reagent Set, F10	53 57 00	27 61 16	
Transmission	See page 30 for details					
Suspended Solids	0 - 750 mg/l TSS	Turbidity	No Reagents Required		27 61 50	
Urea	0.1 - 2.5 mg/l Urea 0.2 - 5 mg/l Urea (by dilution)		Urea Reagent Set	51 78 00 BT	27 62 10	

Multi-Parameter MD 100 Instruments

Several multi-parameter variations of the MD 100 are available including:

- 2 in 1
- 3 in 1
- 4 in 1
- 5 in 1
- 6 in 1

For complete parameters, ranges and testing methods, please visit the MD 100 section of our website:

www.lovibond.us/md100



MD 100 Absorbance & Transmission Colorimeters

Fixed single wavelength MD 100 instruments are available for custom or proprietary testing applications. Test results can be displayed in your choice of either ABS or %T units and are available in the following standard wavelengths:

- 430 nm
- 530 nm
- 560 nm
- 580 nm
- 610 nm
- 660 nm

Instruments are supplied with 3 x 24 mm sample cells, batteries and an instruction manual in a convenient carrying case.

Ask us about
Private Label & OEM
Opportunities!



Ordering Information

Parameter	P/N
Absorbance / Transmission, 430 nm	27 90 00
Absorbance / Transmission, 530 nm	27 90 10
Absorbance / Transmission, 560 nm	27 90 20
Absorbance / Transmission, 580 nm	27 90 30
Absorbance / Transmission, 610 nm	27 90 40
Absorbance / Transmission, 660 nm	27 90 50

MD 100 COD Set (iso 15705:2002)

The MD 100 COD Set comes complete with everything the user needs for COD analysis.

Simply add sample to the VARIO COD tube test vial, heat it in the RD 125 Reactor, and analyze sample using the MD 100 Single Parameter Colorimeter for COD.

The COD Set is supplied with:

- MD 100 COD Colorimeter
- 16 mm adapter
- 25 tube tests for VARIO Low Range (0-150 mg/L) COD analysis
- 25 tube tests for VARIO Mid-Range (0-1500 mg/L) COD analysis
- RD 125 Reactor
- Tube test stand (24 tube capacity)

Ordering Information

Item	P/N
MD 100 COD Set	27 61 30

Includes: MD 100 COD Colorimeter (with standard accessories), RD 125 Reactor, 1 each of VARIO LR COD Reagent (25 ct.) and VARIO MR COD Reagent (25 ct.) and a Tube Test Rack (24 tube capacity)



RD 125 Reactor

For the Tube test digestion of:

- COD (150°C)**
- TOC (120°C)**
- Total Chromium (100°C)**
- Total Nitrogen (100°C)**
- Total Phosphate (100°C)**



The RD 125 Reactor is used for the chemical digestion of water samples, such as determination of COD, TOC, Total Phosphate and Total Nitrogen.

The required temperatures and reaction times are pre-programmed, and easy to select by using the keypad. Users can pre-select reaction times of 30, 60 and 120 minutes or can set it to operate continuously.

When digestion is complete, the reactor automatically turns off and will sound an alarm.

The RD 125 Reactor is fitted with 24 holes for 16 mm diameter vials.

Ordering Information

Item	P/N
RD 125 Reactor	2 41 89 40

Specifications

Power supply	230 V / 50-60 Hz or 115 V / 50-60 Hz (switchable)
Power	550 W
Dimensions	10.83 x 6.10 x 3.74 inches
Weight	7.9 lbs.
Materials, housing	ABS
Protection grid	PPS
Lid	PC
Block insert	PBT
Heating block	Aluminum
Holes in the aluminum block	24 holes, 16.2 mm ± 0.2 mm
Selectable temp.	100 / 120 / 150 °C
Probe type	Pt100 A class
Temperature stability	± 1 °C at the Pt100
Selected time	30 / 60 / 120 / min. and continuous operation (∞)
Heating up	from 20°C to 150°C in 12 min.
Regulation	Microprocessor
Protection against overheating	at the alu block at 190 °C
Beeper	max. 88 dB (piezo buzzer)
Environmental conditions	10 – 40 °C max. 85 % rel. humidity
Conformity	CE

RD 125 Reactor & IRiM

IRiM - Data Transfer Module



The IRiM (infra-red data transfer module) uses infra-red technology to transmit measurement data from the MD 100 and MD 600 colorimeters to one of 3 optional interfaces. These interfaces can be used to connect to a PC, a USB printer¹⁾ or a serial printer²⁾. The interface which is selected is displayed by an LED function indicator. The user can choose between the interfaces using the "Select" button.

The unit is supplied with data logging software providing easy and rapid transfer of data to the PC. As an option, the data can be saved as an Excel sheet or a .txt file.

Measurement data can quickly be printed out, using a specified¹⁾ USB or alternatively a printer with a serial plug-in connected to the IRiM.

Applicable for the following operating systems: Windows XP, Windows Vista and Windows 7.

¹⁾ USB printer: HP Deskjet 6940

Ordering Information

The IRiM is delivered ready for use, with the following accessories:

USB cable, 4 (AA) batteries, screwdriver, CD-ROM, operating instructions and guarantee certificate

P/N: 21 40 50

MD 600 Multi-Parameter Colorimeter



The Lovibond® MD 600 Multi-Parameter Colorimeter is a versatile instrument that tests for a wide range of water quality parameters and is perfect for use in either the field or laboratory.

Using the Lovibond® Tintometer® "Open Reagent System" (which uses VARIO Powder Packs, tablet, liquid and ampule reagents) the MD 600 features an industry-leading 6 LED photo detector array and supports over 120 pre-programmed methods (from Alkalinity through Zinc) and 20 user defined methods.

Up to 1,000 data sets can be stored in the instrument's internal memory to assure good record keeping, and can be transferred to a computer or printer with the IRiM.

Highlights

- Over 120 methods
- 8 language options including English, French, Spanish, and Brazilian Portuguese
- 1,000 point data storage with time and date stamp
- User Favorites Menu
- Ideal for lab or field use
- New Method Upload via internet
- Waterproof*
- On-Screen Assistance

* as defined in IP 68, 1 hour at 0.1 meter

NEW METHOD UPLOAD

- As new methods are developed, users can download updates from our website for free!
- Gives users access to new or alternate methods, updated ranges, and new features
- Never have an "old" instrument again!

VARIETY OF PARAMETERS

- Over 120 pre-programmed parameters, methods, and ranges
- Many parameters offer multiple ranges and methods
- Many parameters have the flexibility of using our Powder Pack™, tablet and/or liquid reagents
- Unique colorimetric methods

ON SCREEN ASSISTANCE

- Easily display important test method information including sample cell size and reagents
- Scroll driven menu system allows user to easily find the test they are looking for. No more referencing cumbersome manuals or memorizing method numbers

Specifications

Display	Backlit graphic-display	Photometric Accuracy*	2% FS (T = 20°C – 25°C)	Weight (unit)	Approx. 1 lb. (450 g)
Interfaces	Infrared interface for test data transfer ¹ , RJ45 socket for Internet updates ²	Photometric Resolution	0.005 A	Ambient Conditions	5–40°C at max. 30–90% rel. humidity (non-condensing)
Optics	LEDs, interference filters (IF) and photo sensor in transparent sample chamber Wavelength range: 430 nm IF Δλ = 5 nm 530 nm IF Δλ = 5 nm 560 nm IF Δλ = 5 nm 580 nm IF Δλ = 5 nm 610 nm IF Δλ = 6 nm 660 nm IF Δλ = 5 nm IF = interference filter	Operation	Acid and solvent resistant, touch-sensitive keypad with audible feedback via integrated beeper	Language Selection	German, English, French, Spanish, Italian, Portuguese, Polish, Indonesian ; additional languages via Internet update
Wavelength Accuracy	± 1 nm	Power Supply	4 batteries (Mignon AA/LR6); Operation time: approx. 26 h continuous operation or 3500 tests	Memory Capacity	approx. 1000 data sets
Auto-Off	approx. 20 minutes after last keypress with audible signal	Dimensions	Instrument: 8.3" x 3.7" x 1.8" Case: 15.5" x 11.6" x 4.2"	Conformity	CE

¹ optional available: IRiM (See page 29)

² optional available: connection cable with integrated electronics (RS 232 / RJ-45 plug)

* tested with standard solutions

Ordering Information

Item	P/N	Item	P/N	Item	P/N
MD 600 Colorimeter	21 40 20	Vial stand for 6 round vials Ø 24 mm, acrylic glass	41 89 51	Tablet crusher, 10 cm length	36 41 09
Set of 12 round vials with lid Height 48 mm, Ø 24 mm	19 76 20	Vial stand for 10 vials (Ø 16 mm or □ 13,5 mm), acrylic glass	41 89 57	Cleaning brush, 10 cm	38 02 30
Set of 10 round vials with lid Height 90 mm, Ø 16 mm	19 76 65	Light Shielding Rings for vial Ø 24 mm (12 pc.)	19 76 26	Verification Standard Kit	21 56 40
Adapter for round vials Ø 16 mm	19 80 21 90	Cleaning cloth for vials	19 76 35	Serial cable for software updates	21 40 30
Adapter for round vials Ø 13 mm	19 80 21 92	Plastic funnel with handle	47 10 07	IRiM (Data Transfer Device)	21 40 50
Multi-Vials Type 3, with lids path length 10 mm, 10 ml volume Height 48 mm, Ø 24 mm (12 pc.)	19 76 05	Tablet crusher, 13 cm length	36 41 00		

Delivery Content

- Instrument in carrying case
- 4 x AA batteries
- 3 x 24 mm vials (glass, with lid)
- 3 x 16mm vials (glass, with lid)
- 1 tablet crusher & 1 brush
- 13 mm & 16 mm tube adapters
- Warranty Information
- Certificate of Conformity
- Instruction Manual



Parameter	Range	Method	Reagent	Qty	Reagent P/N
Absorbance			Direct Reading - no reagents required		
Acid Demand	0.1 - 4 mmol/l	Acid / Indicator	Alka-M Photometer Tablets	100 ct.	51 32 10 BT
Alkalinity-M	5 - 200 mg/l CaCO ₃	Acid / Indicator	Alka-M Photometer Tablets	100 ct.	51 32 10 BT
Alkalinity-M, HR	5 - 500 mg/l CaCO ₃	Acid / Indicator	Alka-M HR Photometer Tablets	100 ct.	51 32 40 BT
Alkalinity-P	5 - 300 mg/l CaCO ₃	Acid / Indicator	Alka-P Photometer Tablets	100 ct.	51 32 30 BT
Aluminum	0.01 - 0.25 Al	Eriochrome Cyanine R	VARIO Aluminum ECR Reagent, F20 VARIO Hexamethylenetetramine, F20 VARIO ECR Masking Reagent Solution VARIO Aluminum Reagent Set	100 ct. 100 ct. 25 ml 100 Tests	53 16 20 53 16 50 53 16 25 53 50 00
Aluminum	0.01 - 0.3 mg/l Al	Eriochrome Cyanine R	Aluminum No. 1 Tablet Aluminum No. 2 Tablet Combi-Pack: Aluminum No. 1 / Aluminum No. 2	100 ct. 100 ct. 100 Tests	51 54 60 BT 51 54 70 BT 51 76 01 BT
Ammonia	0.02 - 1 mg/l N	Indophenol Blue	Ammonia No.1 Tablet Ammonia No.2 Tablet Combi-Pack: Ammonia No. 1 / Ammonia No. 2	100 ct. 100 ct. 100 Tests	51 25 80 BT 51 25 90 BT 51 76 11 BT
Ammonia	0.01 - 0.8 mg/l N	Salicylate	VARIO Ammonia Salicylate Reagent, F10 VARIO Ammonia Cyanurate Reagent, F10 VARIO Ammonia Nitrogen Reagent Set	100 ct. 100 ct. 100 Tests	53 13 70 53 13 80 53 55 00
Ammonia	0.02 - 2.5 mg/l N	Salicylate	VARIO Ammonia Salicylate Reagent, F5 VARIO Ammonia Cyanurate Reagent, F5 VARIO LR AM Dilution Tube VARIO Deionized Water (for zero) VARIO LR Ammonia Reagent Set	50 ct. 50 ct. 50 ct. 100 ml 25 Tests	53 11 50 53 11 60 -- -- 53 56 00
Ammonia	1 - 50 mg/l N	Salicylate	VARIO Ammonia Salicylate Reagent, F5 VARIO Ammonia Cyanurate Reagent, F5 VARIO HR AM Dilution Tube VARIO Deionized Water (for zero) VARIO HR Ammonia Reagent Set	50 ct. 50 ct. 50 ct. 100 ml. 25 Tests	53 11 50 53 11 60 -- -- 56 56 50
Ammonia, Free (Part of Monochloramines)	0.01 - 0.5 mg/l N	Indophenol	VARIO Free Ammonia Reagent Solution VARIO Monochlor F Reagent VARIO Free Ammonia Reagent Set	4 ml 100 ct. 100 Tests	53 18 00 53 18 10 53 58 00
Boron	0.1 - 2 mg/l B	Azomethine	Boron No. 1 Tablet Boron No. 2 Tablet Combi-Pack: Boron No. 1 / No. 2	100 ct. 100 ct. 100 Tests	51 57 90 51 58 00 51 76 81
Bromine	0.05 - 13 mg/l Br	DPD	DPD No.1 Tablet	100 ct.	51 10 50 BT

Parameter	Range	Method	Reagent	Qty	Reagent P/N
Chloride	0.01 - 6 mg/l Cl	Silver Nitrate/Turbidity	Chloride T1 Tablets Chloride T2 Tablets Combi-Pack: Chloride T1 / T2	100 ct. 100 ct. 100 Tests	51 59 10 BT 51 59 20 BT 51 77 41 BT
Chloride	0.5 - 20 mg/l Cl	Mercury Thiocyanate / Iron Nitrate	Chloride Reagent A (KS251) Chloride Reagent B (KS253) Chloride Reagent Set	65 ml 65 ml 50 Tests	56L025165 56L025365 56R018490
Chlorine free, combined, total	0.01 - 6 mg/l Cl ₂	DPD	DPD No. 1 Tablet DPD No. 3 Tablet Combi-Pack: DPD No. 1 / DPD No. 3	100 ct. 100 ct. 100 Tests	51 10 50 BT 51 10 80 BT 51 77 11 BT
Chlorine free, combined, total	0.1 - 10 mg/l Cl ₂	DPD	DPD No. 1 HR Tablets DPD No. 3 HR Tablets Combi-Pack: DPD No. 1 HR / DPD No. 3 HR	100 ct. 100 ct. 100 Tests	51 15 00 BT 51 15 90 BT 51 77 91 BT
Chlorine free, combined, total	0 - 4 mg/l Cl ₂	DPD	DPD 1 Buffer Solution DPD 1 Reagent Solution DPD 3 Solution Chlorine Reagent Set	3 x 15 ml 1 x 15 ml 2 x 15 ml 150 Tests	47 10 10 47 10 20 47 10 30 47 10 56
Chlorine free, combined, total	0.02 - 2 mg/l Cl ₂	DPD	VARIO DPD Free Chlorine Reagent, F10 VARIO DPD Total Chlorine Reagent, F10	100 ct. 100 ct.	53 01 00 53 01 20
Chlorine free, combined, total	0.1 - 8 mg/l Cl ₂	DPD	VARIO DPD Free Chlorine Reagent, F10 VARIO DPD Total Chlorine Reagent, F10	100 ct. 100 ct.	51 01 00 53 01 20
Chlorine, UHR (KI)	5 - 200 mg/l Cl ₂	KI / Acid	Chlorine HR (KI) Tablet Acidifying GP Tablet Combi-Pack: Chlorine HR (KI) / Acidifying GP	100 ct. 100 ct. 100 tests	51 30 00 BT 51 54 80 BT 51 77 21 BT
Chlorine Dioxide	0.02 - 11 mg/l ClO ₂	DPD / Glycine	DPD No. 1 Tablet <i>Required if testing in the presence of chlorine:</i> Combi-Pack: DPD No. 1 / DPD No. 3 Glycine Tablet	100 ct. 100 Tests 100 ct.	51 10 50 BT 51 77 11 BT 51 21 70 BT
Chromium	0.02 - 2 mg/l Cr	1, 5-Diphenylcarbozide	Persulfate Reagent for Cr Chromium Hexavalent Reagent Chromium Reagent Set	100 ct. 100 ct. 100 Tests	53 73 00 53 73 10 53 78 00
COD	0 - 150 mg/l O ₂ 0 - 1500 mg/l O ₂ 0 - 15000 mg/l O ₂	Dichromate / H ₂ SO ₄	VARIO LR COD Tube Tests (25 pack) VARIO MR COD Tube Tests (25 pack) VARIO HR COD Tube Tests (25 pack)	25 ct. 25 ct. 25 ct.	2 42 07 20 2 42 07 21 2 42 07 22
Copper HR free and total	0.05 - 5 mg/l Cu	Biquinoline	Copper No. 1 Tablet Copper No. 2 Tablet Combi-Pack: Copper No. 1 / No. 2	100 ct. 100 ct. 100 Tests	51 35 50 BT 51 35 60 BT 51 76 91 BT
Copper HR, free only	0.05 - 5 mg/l Cu	Bicinchoninate	VARIO Copper Reagent, F10	100 ct.	53 03 00

MD 600 Colorimeter

Parameter	Range	Method	Reagent	Qty	Reagent P/N
Copper free and total	0.05 - 4 mg/l Cu	Bicinchoninate	Coppercol Reagent 1 Solution (KS240)	30 ml	56L024030
			Coppercol Reagent 2 Solution(KS241)	30 ml	56L024130
			Coppercol Reagent 3 Powder (KS242)	10 g	56L024210
			Copper No. 2 Tablet	100 ct.	51 35 60 BT
			Copper Reagent Set	50 Tests	56R023355
Cyanide	0.01 - 0.5 mg/l CN	Pyridine-barbituric acid	Cyanide-11 Reagent	18 g	--
			Cyanide-12 Reagent	12.5 g	--
			Cyanide-13 Reagent Solution	53 ml	--
			Cyanide Reagent Set	~200 Tests	2 41 88 75
Cyanuric Acid	0 - 160 mg/l Cys	Melamine	CyA Test Tablet	100 ct.	51 13 70 BT
DEHA	20 - 500 µg/l DEHA	PPST	DEHA Solution	100 ml	46 11 81
			DEHA Tablet	100 ct.	51 32 20 BT
			Combi-Pack: DEHA Solution & DEHA Tablets	100 Tests	51 78 10 BT
DEHA	20 - 500 µg/l DEHA	PPST	VARIO DEHA-2 Reagent Solution	100 ml	53 14 10
			VARIO Oxyscav-1 Reagent	100 ct.	53 14 00
			VARIO DEHA Reagent Set	100 Tests	53 60 00
Fluoride	0.05 - 2 mg/l F	SPADNS	SPADNS Reagent	250 ml	46 74 81
				500 ml	46 74 82
			Fluoride Standard	30 ml	20 56 30
Hardness, Calcium	50 - 900 mg/l CaCO ₃	Murexide	Calcheck Tablet	100 ct.	51 56 50
Hardness, Calcium	0 - 500 mg/l CaCO ₃	Murexide	Combi-Pack: Calcio-H No. 1 / No. 2	100 Tests	51 77 61 BT
			Combi-Pack: Calcio-H No. 1 / No. 2	250 Tests	51 77 62 BT
Hardness, Total	2 - 50 mg/l CaCO ₃ 20 - 500 mg/l CaCO ₃	Metallpthalein	Hardcheck P Tablet	100 ct.	51 56 60 BT
Hazen (Color of Water)	0 - 500 Pt.Co. Units	Platinum Cobalt	Direct Reading - no reagents required		
Hydrazine	0.05 - 0.5 mg/l N ₂ H ₄	Dimethylamino-benzaldehyde	Hydrazine Test Powder	30 g	46 29 10
			Spoon	1 ea.	38 49 30
			Hydrazine Reagent Set	100 Tests	51 78 30
Hydrazine	0.01 - 0.6 mg/l N ₂ H ₄	Dimethylamino-benzaldehyde	VARIO Hydra 2 Reagent Solution	100 ml	53 12 00
Hydrazine	0.01 - 0.7 mg/l N ₂ H ₄	PDMAB	Hydrazine Reagent Ampoules	30 ct.	38 04 70
Hydrogen Peroxide	0.03 - 3 mg/l H ₂ O ₂	DPD / Catalyst	Hydrogen Peroxide LR Tablet	100 ct.	51 23 80 BT
Iodine	0.05 - 3.6 mg/l I	DPD	DPD No. 1 Tablet	100 ct.	51 10 50 BT

Parameter	Range	Method	Reagent	Qty	Reagent P/N
Iron (II, III)	0.02 - 1 mg/l Fe	PPST	Iron LR Tablet (Fe ²⁺ and Fe ³⁺)	100 ct.	51 53 70 BT
			Iron (II) LR Tablet (Fe ²⁺)	100 ct.	51 54 20 BT
Iron (II, III)	0.02 - 1 mg/l Fe	1, 10-Phenanthroline	VARIO Iron Ferro Reagent, F10	100 ct.	53 05 60
Iron, Total	0.02 - 1.8 mg/l Fe	TPTZ	VARIO Iron TPTZ Reagent, F10	100 ct.	53 05 50
Iron	0.03 - 2.0 mg/l Fe	Ferrozine / Thioglycolate	Ferrozine/Thioglycolate Reagent (KS61)	65 ml	56L006165
			Thioglycolate Reagent (KS63)	65 ml	56L006365
			Ammonia Persulfate Tablet (KT274)	50 ct.	56T027450
			Phenolphthalein Indicator (KT135)	65 ml	56L013565
			Calcium Hardness Buffer (KS144)	65 ml	56L014465
			Iron Reagent Set	50 Tests	56R018890
Iron	0.03 - 2.0 mg/l Fe	Ferrozine / Thioglycolate	Acetate Buffer (KS60 FE1)	65 ml	56L006065
			Thioglycolate Reagent (KS63)	65 ml	56L006365
			Ferrozine Reagent (KS65 FE7)	65 ml	56L006565
			Iron Reagent Set	50 Tests	56R023490
Iron	0.1 - 10 mg/l Fe	Thioglycolate	Total Hardness Buffer (KS160 TH2 FE8)	65 ml	56L016065
			Thioglycolate Reagent (KS63)	65 ml	56L006365
			Iron Reagent Set	50 Tests	56R023590
Manganese	0.2 - 4 ml/l Mn	Formaloxime	Manganese LR No. 1 Tablet	100 ct.	51 60 80 BT
			Manganese LR No. 2 Tablet	100 ct.	51 60 90 BT
			Combi-Pack: Manganese LR No. 1 / LR No. 2	100 Tests	51 76 21 BT
Manganese	0.01 - 0.7 mg/l Mn	PAN	VARIO Ascorbic Acid Reagent	100 ct.	53 11 00
			VARIO Alkaline Cyanide Reagent	60 ml	53 06 20
			VARIO PAN Indicator Solution	60 ml	53 06 30
			VARIO LR Manganese Reagent Set, F10	50 Tests	53 50 90
			VARIO Rochelle Salt Solution	30 ml	53 06 40
				500 ml	53 06 42
Manganese	0.1 - 18 mg/l Mn	Periodate Oxidation	VARIO Manganese Citrate Buffer, F10	100 ct.	53 06 50
			VARIO Sodium Periodate Reagent, F10	100 ct.	53 06 60
			VARIO HR Manganese Reagent Set	100 Tests	53 51 00
Manganese	0.05 - 5 mg/l Mn	Formaloxime	Manganese Reagent A (KS265)	30 ml	56L026530
			Manganese Reagent B (KS266)	30 ml	56L026630
			Manganese Reagent C (KS267)	30 ml	56L030430
			Manganese Reagent Set	50 Tests	56R024055
Molybdate / Molybdenum	1 - 50 mg/l MoO ₄	Thioglycolate	Molybdate No. 1 HR Tablet	100 ct.	51 30 60 BT
			Molybdate No. 2 HR Tablet	100 ct.	51 30 70 BT
			Combi-Pack Molybdate No. 1 HR / No. 2 HR	100 Tests	51 76 31 BT

MD 600 Colorimeter

Parameter	Range	Method	Reagent	Qty	Reagent P/N
Molybdate / Molybdenum	0.5 - 5 mg/l MoO ₄ 0.03 - 3 mg/l Mo	Mercaptoacetic Acid	VARIO Molybdenum 1 LR Reagent, F20	100 ct.	53 08 10
			VARIO Molybdenum 2 LR Reagent	50 ml	53 08 20
			VARIO LR Molybdate Reagent Set, F20	100 Tests	53 54 50
		Required Accessory:	Mixing Cylinder, 25 ml (Glass)	1 Ea.	19 80 26 50
Molybdate / Molybdenum	0.5 - 66 mg/l MoO ₄	Mercaptoacetic Acid	VARIO Molybdenum HR 1 Reagent, F10	100 ct.	53 07 50
			VARIO Molybdenum HR 2 Reagent, F10	100 ct.	53 07 60
			VARIO Molybdenum HR 3 Reagent, F10	100 ct.	53 07 70
			VARIO HR Molybdenum Reagent Set, F10	100 Tests	53 53 00
Molybdate / Molybdenum	1 - 100 mg/l MoO ₄	Thioglycolate	Thioglycolate Reagent (KS63)	65 ml	56L006365
Monochloramines	0.04 - 4.5 mg/l Cl ₂	Indophenol	VARIO Monochlor F Reagent	100 ct.	53 18 10
Nickel	0.1 - 10 mg/l Ni	Nioxime	Nickel No. 1 Tablet	100 ct.	51 56 30 BT
			Nickel No. 2 Tablet	100 ct.	51 56 40 BT
			Combi-Pack: Nickel No. 1 / No. 2	100 Tests	51 78 50 BT
Nitrate	0.08 - 1 mg/l N	Zinc Reduction / NED	Nitrate Test Powder	15 g	46 52 30
			Nitrate Test Tablet	100 ct.	50 28 10
			Nitrite LR Tablet	100 ct.	51 23 10
			Nitrate Test Tube	1 Ea.	36 62 20
Nitrate	1 - 30 mg/l N	Chromotropic Acid	VARIO Nitra X Reagent Tube, Reagent A	50 ct.	--
			VARIO Nitra X Chromotropic, Reagent B	50 ct.	53 05 90
			Deionized Water (for Zero)	100 ml	--
			VARIO Nitrate Tube Test Reagent Set	25 Tests	53 55 80
Nitrite	0.01 - 0.5 mg/l N	N-(1-Naphthyl)-ethylenediamine	Nitrite LR Tablet	100 ct.	51 23 10 BT
Nitrite	0.01 - 0.3 mg/l N	Diazotation	VARIO Nitrite 3 Reagent, F10	100 ct.	53 09 80
Nitrogen, Total	0.5 - 25 mg/l N	Persulfate-Digestion	VARIO Total N Persulfate Reagent	50 ct.	--
			VARIO Total Nitrogen Reagent A	50 ct.	--
			VARIO Total Nitrogen Reagent B	50 ct.	53 03 90
			VARIO Total Nitrogen Hydroxide LR Tubes	50 ct.	--
			VARIO Total Nitrogen Acid LR / HR Tubes	50 ct.	--
			Deionized Water (for Zero)	100 ml	--
			VARIO LR Total Nitrogen Reagent Set	25 Tests	53 55 50
	Required Accessory:	RD 125 Reactor	1 Ea.	2 41 89 40	
Nitrogen, Total	5 - 150 mg/l N	Persulfate-Digestion	VARIO Total N Persulfate Reagent	50 ct.	--
			VARIO Total Nitrogen Reagent A	50 ct.	--
			VARIO Total Nitrogen Reagent B	50 ct.	53 03 90
			VARIO Total Nitrogen Hydroxide HR Tubes	50 ct.	--
			VARIO Total Nitrogen Acid LR / HR Tubes	50 ct.	--
			Deionized Water (for Zero)	50 ct.	--
			VARIO HR Total Nitrogen Reagent Set	25 Tests	53 55 60
	Required Accessory:	RD 125 Reactor	1 Ea.	2 41 89 40	

Parameter	Range	Method	Reagent	Qty	Reagent P/N
Oxygen, Active	0.1 - 10 mg/l O ₂	DPD	DPD No. 4 Tablet	100 ct.	51 12 20 BT
Oxygen, Dissolved	10 - 800 µg/l O ₂	Rhodazine D™	Dissolved Oxygen Ampoule (Vacu-Vial®) Adapter for Vacu-Vial®	30 ct. 1 Ea.	38 04 50 19 20 75
Ozone	0.02 - 2 mg/l O ₃	DPD / Glycine	Combi-Pack: DPD No. 1 / DPD No. 3	100 Tests	51 77 11 BT
			<i>Required if testing in the presence of chlorine:</i> Glycine Tablet	100 ct.	51 21 70 BT
PHMB (Biguanide)	2 - 160 mg/l PHMB	Buffer / Indicator	PHMB Photometer Tablet	100 ct.	51 61 00 BT
Phosphate, Ortho	0.05 - 4 mg/l PO ₄	Phosphomolybdic Acid / Ascorbic Acid	Phosphate No. 1 LR Tablet	100 ct.	51 30 40
			Phosphate No. 2 LR Tablet	100 ct.	51 30 50 BT
			Combi-Pack: Phosphate No. 1 LR / No. 2 LR	100 Tests	51 76 51 BT
Phosphate, Ortho	1 - 80 m/l PO ₄	Vanadomolybdate	Phosphate No. 1 HR Tablet	100 ct.	51 58 10
			Phosphate No. 2 HR Tablet	100 ct.	51 58 20
			Combi-Pack: Phosphate No. 1 HR / No. 2 HR	100 Tests	51 76 61
Phosphate, Ortho	0.06 - 2.5 mg/l PO ₄	Phosphomolybdenum Blue / Ascorbic Acid	VARIO Phosphate 3 Reagent, F10	50 ct.	53 15 51
				100 ct.	53 15 50
				1000 ct.	53 15 53
Phosphate, Ortho	0.06 - 5 mg/l PO ₄	Phosphomolybdenum Blue / Ascorbic Acid	VARIO Dilution Vial	50 ct.	--
			VARIO Phosphate 3 Reagent, F10	50 ct.	53 15 51
			Deionized Water (for Zero)	100 ml	--
	VARIO Ortho Phosphate Reagent Set	50 Tests	53 52 00		
Phosphate, Total	0.02 - 1.1 mg/l P 0.06 - 3.5 mg/l PO ₄	Persulfate Digestion: Phosphomolybdenum Blue / Ascorbic Acid	VARIO Acid Reagent Vial	50 ct.	--
			VARIO Phosphate 3 Reagent, F10	50 ct.	53 15 51
Acid Hydrolyzable	0.02 - 1.6 mg/l P 0.06 - 5 mg/l PO ₄	Persulfate Digestion: Phosphomolybdenum Blue / Ascorbic Acid	Deionized Water (for Zero)	100 ml	--
			VARIO Sodium Hydroxide, 1 N	100 ml	53 15 20
			VARIO Sodium Hydroxide, 1.54 N	100 ml	53 15 30
			VARIO Potassium Persulfate Reagent, F10	50 ct.	53 15 60
			VARIO Phosphorous, Total & Acid Hydrolyzable Reagent Set	50 Tests	53 52 50
	Required Accessory:	RD 125 Reactor	1 Ea.	2 41 89 40	
Phosphate, Total	0.02 - 1.1 mg/l P 0.06 - 3.5 mg/l PO ₄	Acid / Persulfate Digestion Ascorbic Acid	VARIO Acid Reagent Vial	50 ct.	--
			VARIO Phosphate 3 Reagent, F10	50 ct.	53 15 51
			Deionized Water (for Zero)	100 ml	--
			VARIO Sodium Hydroxide, 1.54 N	100 ml	53 15 30
			VARIO Potassium Persulfate Reagent, F10	50 ct.	53 15 60
	VARIO Phosphate, Total Reagent Set	50 Tests	53 52 10		
	Required Accessory:	RD 125 Reactor	1 Ea.	2 41 89 40	
Phosphate, Ortho	5 - 40 mg/l PO ₄	Vanadomolybdate	Phosphate 1 Reagent Ampoule	30 ct.	38 04 60
Phosphate, Ortho	0.05 - 5 mg/l PO ₄	Stannous Chloride	Phosphate 2 Reagent Ampoule	30 ct.	38 04 80

MD 600 Colorimeter

Parameter	Range	Method	Reagent	Qty	Reagent P/N
Phosphate	0.1 - 10 mg/l PO ₄	Phosphomolybdic Acid / Ascorbic Acid	CRP Reagent (KS80)	2 x 65 ml	56L008065
			Ascorbic Acid (KP19)	20 g	56P011920
			Phosphate Reagent Set	50 Tests	56R023765
Phosphate	5 - 80 mg/l PO ₄	Vanadomolybdate	Ammonia Molybdate (KS228)	65 ml	56L022865
			Ammonia Metavanadate (KS229)	65 ml	56L022965
			Sulfuric Acid, 50% (KS278)	65 ml	56L027865
			Phenolphthalein Indicator (KS135)	65 ml	56L013565
			Calcium Hardness Buffer (KS144)	65 ml	56L014465
			Ammonia Persulfate Tablet	50 ct.	56T027450
Phosphate Reagent Set	50 Tests	56R019090			
Phosphonate	0.02 - 125 mg/l PO ₄	Persulfate UV Oxidation	VARIO Potassium Persulfate, F10	100 ct.	53 15 60
			VARIO Phosphate 3 Reagent, F10	2 x 100 ct.	53 15 50
			VARIO Phosphonate Reagent Set	100 Tests	53 52 20
			Required Accessories: UV Lamp & Power Supply (110 v)* Mixing Cell with lid	1 Ea. 1 Ea.	40 07 45 40 07 60
pH	5.2 - 6.8 pH	Bromcresol Purple	Bromcresol Purple Photometer Tablet	100 ct.	51 57 00 BT
pH	5.5 - 8.4 pH	Phenol Red	Phenol Red Photometer Tablet	100 ct.	51 17 70 BT
pH	6.5 - 8.4 pH	Phenol Red	Phenol Red Solution	15 ml	47 10 40
pH	8.0 - 9.6 pH	Thymol Blue	Thymol Blue Photometer	100 ct.	51 57 10
Polyacrylates	1 - 30 mg/l	Turbidity	Polyacrylate Reagent 1 (KS255)	65 ml	56L025565
			Polyacrylate Reagent 2 (KS256)	65 ml	56L026565
			Propan-2-ol (KS336)	65 ml	56L033665
			Cartridge	1 Ea.	AS-K22811-KW
			2, 4 Dinitrophenol (KS173)	65 ml	56L017365
			Nitric Acid (KT183)	65 ml	56L018365
Polyacrylate Reagent Set	50 Tests	56R019165			
Potassium	0.7 - 12 mg/l K	Tetraphenylborate - Turbidity	Potassium T Tablet	100 ct.	51 56 70
Silica	0.05 - 4 mg/l SiO ₂	Silicomolybdate	Silica No. 1 Tablet	100 ct.	51 31 30
			Silica No. 2 Tablet	100 ct.	51 31 40
			Combi-Pack: Silica No. 1 / No. 2	100 Tests	51 76 71
			Silica PR Tablet (in presence of phosphate)	100 ct.	51 31 50
Silica	0.1 - 1.6 mg/l SiO ₂	Heteropolyblue	VARIO Amino Acid F Reagent, F10	100 ct.	53 16 00
			VARIO Citric Acid Reagent, F10	2 x 100 ct.	53 17 10
			VARIO Molybdate 3 Reagent Solution	2 x 50 ml	53 17 30
			VARIO Silica LR Reagent Set, 10 ml Sample	100 Tests	53 56 90
Silica	1 - 90 mg/l SiO ₂	Silicomolybdate	VARIO Silica HR Molybdate, F10	100 ct.	53 17 00
			VARIO Silica HR Acid Reagent, F10	100 ct.	53 17 10
			VARIO Silica HR Citric Acid, F10	100 ct.	53 17 20
			VARIO Silica HR Reagent Set, 10 ml Sample	100 Tests	53 57 00

Parameter	Range	Method	Reagent	Qty	Reagent P/N
Silica	0.1 - 8 mg/l SiO ₂	Heteropolyblue	Silica Reagent 1 (KS104)	65 ml	56L010465
			Silica Reagent 2 (KS105)	65 ml	56L010565
			Silica Reagent 3 (KS106)	10 g	56P010610
			Silica Reagent Set	50 Tests	56R023856
Sodium Hypochlorite	0.2 - 16% NaOCl	Potassium Iodide	Acidifying GP Tablet	100 ct.	51 54 80 BT
			Chlorine HR (KI) Tablet	100 ct.	51 30 00 BT
			Combi-Pack: Chlorine HR (KI) / Acidifying GP	100 Tests	51 77 21 BT
Required Accessory:			Dilution Set (for sample preparation)	1 Ea.	41 44 70
Sulfate	5 - 100 mg/l SO ₄	Bariumsulfate Turbidity	VARIO Sulfa 4 Reagent, F10	100 ct.	53 21 60
Sulfate	5 - 100 mg/l SO ₄	Bariumsulfate Turbidity	Sulfate T Tablet	100 ct.	51 54 50 BT
Sulfide	0.04 - 0.5 mg/l S	DPD / Catalyst	Sulfide No. 1 Tablet	100 ct.	50 29 30
			Sulfide No. 2 Tablet	100 ct.	50 29 40
			Combi-Pack: Sulfide No. 1 / No. 2	100 Tests	51 78 40
Sulfite	0.1 - 5 mg/l SO ₃	DTNB	Sulfite LR Tablet	100 ct.	51 80 20 BT
Suspended Solids	5 - 750 mg/l	Turbidity / Attenuated Radiation Method	No Reagents Required		
Triazoles	1 - 16 mg/l	Catalyzed UV Digestion	VARIO Triazole Reagent, F25	100 ct.	53 22 00
Turbidity	0 - 1000	Attenuated Radiation Method	No Reagents Required		
Urea	0.1 - 2.5 mg/l CH ₄ N ₂ O	Urease / Indophenol	Urea Reagent 1	15 ml	45 93 00
			Urea Reagent 2	10 ml	45 94 00
			Ammonia No. 1 Tablet	100 ct.	51 25 80 BT
			Ammonia No. 2 Tablet	100 ct.	51 25 90 BT
Urea Reagent Set	100 Tests	51 78 00 BT			
Zinc	0.02 - 1 mg/l Zn	Zincon / EDTA	Copper / Zinc LR Tablet	100 ct.	51 26 20 BT
			EDTA Tablet	100 ct.	51 23 90 BT
			Dechlor Tablet	100 ct.	51 23 50 BT
Combi-Pack: Copper / Zinc LR, EDTA & Dechlor	100 Tests	51 23 50 BT			
Zinc	0.1 - 2.5 mg/l	Zincon / EDTA	Zinc Reagent 1 (KS243)	65 ml	56L024365
			Zinc Reagent 2 (KS244)	20 g	56L024420
Zinc Reagent Set	50 Tests	56R023965			

SpectroDirect



Highlights

- 330 - 900 nm
- Multi-functional sample cell chamber eliminates need for adapters
- Large, illuminated LCD display
- Fast, easy lamp change
- New method upload via internet
- 6 language options including English, French, Spanish and Brazilian Portuguese
- 1000 point data storage with time and date stamp
- 35 User-Defined Methods
- On-Screen Assistance

The SpectroDirect is a versatile, wavelength scanning, single beam spectrophotometer designed specifically for water quality analysis. The instrument comes programmed with a wide-range of pre-programmed methods and is ideal for laboratory use.

The instrument has an innovative tungsten lamp with a flash function — so the lamp is only on during the measurement process, which eliminates a warm-up period. The SpectroDirect also features a unique sample cell chamber which allows for the use of a wide range of sample cell sizes and shapes — without any cumbersome adapters!

The SpectroDirect also has on screen assistance which allows the user to confirm the correct reagents and sample cell are being used with the test.

USER CALIBRATION MODE

- Calibrate instrument to any government or organizational standard (e.g., NIST, ISO)
- When testing within a very specific range, resolution can be improved
- Account for interferences known to be present in the sample

WAVELENGTH SCANNING ABILITY

- Wavelength scan is performed over the user defined interval between 330 and 900nm
- Display shows graph of the spectrum; with a push of a button, screen displays a data list with corresponding maximum and minimum absorption

MULTI-FUNCTIONAL SAMPLE CHAMBER

- Accommodates sample cells ranging from 10mm up to 50mm without adapters



Sample Chamber

Specifications

Wavelength range:	330 to 900 nm
Photometric range:	-0.3 to 2.5 Abs
Spectral bandwidth:	10 nm
Wavelength accuracy:	±2 nm
Wavelength reproducibility:	±1 nm
Light source:	Pre-adjusted tungsten halogen lamp
Monochromator:	Holographic grating
Detector:	Silicon photodiode
Multifunctional sample chamber for:	Round vials 24 and 16 mm Ø, Rectangular cells 10-50 mm
Display:	Backlit LCD graphic display
Language options:	German, English, French, Italian, Spanish, Portuguese
Storage capacity:	1000 test data sets
Serial interface:	RS232
Dimensions: (L x W x H)	270 x 275 x 150 mm
Weight:	approx. 3.2 kg
Power supply unit:	Input: 100 - 240 V ~ 1.0 A 50 - 60 Hz Output: 12 V 30 W
Conformity	CE

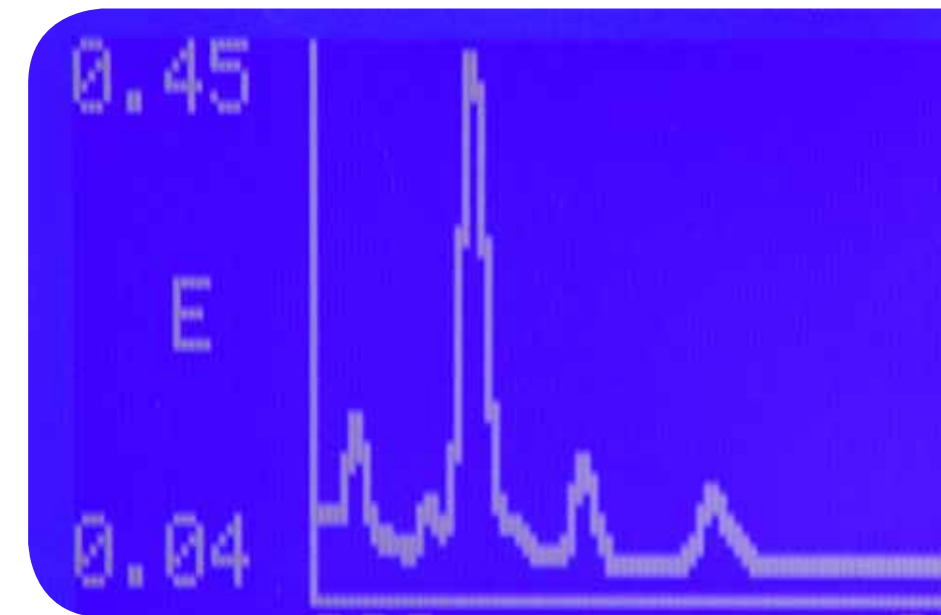
Ordering Information

Item	P/N	Item	P/N
SpectroDirect Spectrophotometer	71 20 00	W 100, rectangular cell optical glass OG, 10 mm path length	60 10 40
Replacement halogen lamp	71 10 00	W 100, rectangular cell optical glass OG, 50 mm path length	60 10 70
Magnetic pin (for updates)	19 80 16 87	W 110, rectangular cell Quartz-UV-glass, 10 mm path length	66 11 30
Connection cable to a PC	19 81 97	Arsenic glass apparatus delivery content:	37 05 00
Connection to a 12 V plug	71 10 40	Erlenmeyer flask	37 05 01
Case for transport	71 20 50	Glass stopper	37 05 02
Universal adapter for sockets	19 20 65	Absorption tube	37 05 03
Secondary standard set	71 11 60	additionally required (not included, please order separately):	
Plastic funnel with handle	47 10 07	W 100, cell, Optical-Glass-OG, 20 mm path length	60 10 50
Cleaning cloth for vials	19 76 35		
External battery pack 12 V, Ni / Cd with cable for connection	71 10 50		
12 round vials with lid Height 48 mm, 24 mm Ø	19 76 20		
10 round vials with lid Height 90 mm, 16 mm Ø	19 76 65		
Vial stand for 6 round vials Ø 24 mm, acrylic glass	41 89 51		
Vial stand for 10 vials (Ø 16 mm or □ 13,5 mm), acrylic glass	41 89 57		

Delivery Content

- SpectroDirect Spectrophotometer
- SpectroDirect Spectrophotometer (basic unit)
 - Power supply unit 100 - 240 V
 - Serial cable for connection to a PC
 - Magnetic pin
 - 2 batteries (AA)
 - Manufacturers test certificate M
 - Guarantee sheet
 - Instruction manual

Part Number: 71 20 00



Parameter	Range	Method	Reagent	Qty	Reagent P/N
Absorbance	330 - 900 nm		Direct Reading - no reagents required		
Acid Demand	0.1 - 4 mmol/l	Acid / Indicator	Alka-M Photometer Tablets	100 ct.	51 32 10 BT
Alkalinity-M	5 - 200 mg/l CaCO ₃	Acid / Indicator	Alka-M Photometer Tablets	100 ct.	51 32 10 BT
Alkalinity-M, HR	5 - 500 mg/l CaCO ₃	Acid / Indicator	Alka-M HR Photometer Tablets	100 ct.	51 32 40 BT
Alkalinity-P	5 - 300 mg/l CaCO ₃	Acid / Indicator	Alka-P Photometer Tablets	100 ct.	51 32 30 BT
Aluminum	0.01 - 0.25 Al	Eriochrome Cyanine R	VARIO Aluminum ECR Reagent, F20 VARIO Hexamethylenetetramine, F20 VARIO ECR Masking Reagent Solution VARIO Aluminum Reagent Set	100 ct. 100 ct. 25 ml 100 Tests	53 16 20 53 16 50 53 16 25 53 50 00
Aluminum	0.01 - 0.3 mg/l Al	Eriochrome Cyanine R	Aluminum No. 1 Tablet Aluminum No. 2 Tablet Combi-Pack: Aluminum No. 1 / Aluminum No. 2	100 ct. 100 ct. 100 Tests	51 54 60 BT 51 54 70 BT 51 76 01 BT
Ammonia	0.02 - 1 mg/l N	Indophenol Blue	Ammonia No. 1 Tablet Ammonia No. 2 Tablet Combi-Pack: Ammonia No. 1 / Ammonia No. 2	100 ct. 100 ct. 100 Tests	51 25 80 BT 51 25 90 BT 51 76 11 BT
Ammonia	0.01 - 0.8 mg/l N	Salicylate	VARIO Ammonia Salicylate Reagent, F10 VARIO Ammonia Cyanurate Reagent, F10 VARIO Ammonia Nitrogen Reagent Set	100 ct. 100 ct. 100 Tests	53 13 70 53 13 80 53 55 00
Ammonia	0.02 - 2.5 mg/l N	Salicylate	VARIO Ammonia Salicylate Reagent, F5 VARIO Ammonia Cyanurate Reagent, F5 VARIO LR AM Dilution Tube VARIO Deionized Water (for zero) VARIO LR Ammonia Reagent Set	50 ct. 50 ct. 50 ct. 100 ml 25 Tests	53 11 50 53 11 60 -- -- 53 56 00
Ammonia	1 - 50 mg/l N	Salicylate	VARIO Ammonia Salicylate Reagent, F5 VARIO Ammonia Cyanurate Reagent, F5 VARIO HR AM Dilution Tube VARIO Deionized Water (for zero) VARIO HR Ammonia Reagent Set	50 ct. 50 ct. 50 ct. 100 ml. 25 Tests	53 11 50 53 11 60 -- -- 56 56 50
Ammonia, Free (Part of Monochloramines)	0.01 - 0.5 mg/l N	Indophenol	VARIO Free Ammonia Reagent Solution VARIO Monochlor F Reagent VARIO Free Ammonia Reagent Set	4 ml 100 ct. 100 Tests	53 18 00 53 18 10 53 58 00
Arsenic (III, IV)	0.02 - 0.6 mg/l As	Silver Diethyldithiocarbamate Required Accessories:	See Instruction Manual for Reagent Arsenic Test Setup Optical Glass Cell, 20 mm	1 ea. 1 ea.	37 05 00 60 10 50

Parameter	Range	Method	Reagent	Qty	Reagent P/N
Boron	0.1 - 2 mg/l B	Azomethine	Boron No. 1 Tablet Boron No. 2 Tablet Combi-Pack: Boron No. 1 / No. 2	100 ct. 100 ct. 100 Tests	51 57 90 51 58 00 51 76 81
Bromine	0.05 - 1 mg/l Br	DPD	DPD No. 1 Tablet	100 ct.	51 10 50 BT
Bromine	0.1 - 3 mg/l Br	DPD	DPD No. 1 Tablet	100 ct.	51 10 50 BT
Bromine	0.05 - 6.5 mg/l	DPD	DPD No. 1 Tablet	100 ct.	51 10 50 BT
Cadmium (Cd²⁺)	0.025 - 0.75 mg/l	Cadion	Cadmium Tube Test	25 Tests	42 07 50
Chloride	0.5 - 25 mg/l Cl	Silver Nitrate/Turbidity	Chloride T1 Tablets Chloride T2 Tablets Combi-Pack: Chloride T1 / T2	100 ct. 100 ct. 100 Tests	51 59 10 BT 51 59 20 BT 51 77 41 BT
Chloride	5 - 60 mg/l Cl	Iron (III) Thiocyanate	Chloride 51 Solution Chloride 52 Solution Chloride Reagent Set	2 x 8 ml 2 x 6 ml 50-75 Tests	-- -- 2 41 90 31
Chlorine free, combined, total	0.02 - 0.5 mg/l Cl ₂ 0.1 - 6 mg/l Cl ₂ 0.02 - 3 mg/l Cl ₂	DPD	DPD No. 1 Tablet DPD No. 3 Tablet Combi-Pack: DPD No. 1 / DPD No. 3	100 ct. 100 ct. 100 Tests	51 10 50 BT 51 10 80 BT 51 77 11 BT
Chlorine free, combined, total	0.1 - 10 mg/l Cl ₂	DPD	DPD No. 1 HR Tablets DPD No. 3 HR Tablets Combi-Pack: DPD No. 1 HR / DPD No. 3 HR	100 ct. 100 ct. 100 Tests	51 15 00 BT 51 15 90 BT 51 77 91 BT
Chlorine free, combined, total	0.02 - 3 mg/l Cl ₂	DPD	DPD 1 Buffer Solution DPD 1 Reagent Solution DPD 3 Solution Chlorine Reagent Set	3 x 15 ml 1 x 15 ml 2 x 15 ml 150 Tests	47 10 10 47 10 20 47 10 30 47 10 56
Chlorine free, combined, total	0.02 - 2 mg/l Cl ₂	DPD	DPD Free Chlorine Reagent, F10 DPD Total Chlorine Reagent, F10	100 ct. 100 ct.	53 01 00 53 01 20
Chlorine, UHR (KI)	5 - 200 mg/l Cl ₂	KI / Acid	Chlorine HR (KI) Tablet Acidifying GP Tablet Combi-Pack: Chlorine HR (KI) / Acidifying GP	100 ct. 100 ct. 100 Tests	51 30 00 BT 51 54 80 BT 51 77 21 BT
Chlorine Dioxide	0.05 - 1 mg/l ClO ₂ 0.05 - 2.5 mg/l ClO ₂ <i>Required if testing in the presence of chlorine:</i>	DPD / Glycine	DPD No. 1 Tablet Combi-Pack: DPD No. 1 / DPD No. 3 Glycine Tablet	100 ct. 100 Tests 100 ct.	51 10 50 BT 51 77 11 BT 51 21 70 BT
Chromium	0.005 - 0.5 mg/l Cr 0.02 - 2 mg/l Cr	1, 5-Diphenylcarbozide	Persulfate Reagent for Cr Chromium Hexavalent Reagent Chromium Reagent Set	100 ct. 100 ct. 100 Tests	53 73 00 53 73 10 53 78 00

Parameter	Range	Method	Reagent	Qty	Reagent P/N
COD	0 - 150 mg/l O ₂	Dichromate / H ₂ SO ₄	VARIO LR COD Tube Tests (25 pack)	25 ct.	2 42 07 20
	0 - 1500 mg/l O ₂		VARIO MR COD Tube Tests (25 pack)	25 ct.	2 42 07 21
	0 - 15000 mg/l O ₂		VARIO HR COD Tube Tests (25 pack)	25 ct.	2 42 07 22
	Required Accessory: RD 125 Reactor			1 Ea.	2 41 89 40
Copper HR free and total	0.05 - 1 mg/l Cu 0.5 - 5 mg/l Cu	Biquinoline	Copper No. 1 Tablet	100 ct.	51 35 50 BT
			Copper No. 2 Tablet	100 ct.	51 35 60 BT
			Combi-Pack: Copper No. 1 / No. 2	100 Tests	51 76 91 BT
Copper HR , free only	0.05 - 5 mg/l Cu	Bicinchoninate	VARIO Copper Reagent, F10	100 ct.	53 03 00
Cyanide	0.01 - 0.5 mg/l CN 0.005 - 0.2 mg/l CN	Pyridine-barbituric acid	Cyanide-11 Reagent	18 g	--
			Cyanide-12 Reagent	12.5 g	--
			Cyanide-13 Reagent Solution	53 ml	--
			Cyanide Reagent Set	~200 Tests	2 41 88 75
Cyanuric Acid	0 - 160 mg/l Cys	Melamine	CyA Test Tablet	100 ct.	51 13 70 BT
DEHA	20 - 500 µg/l DEHA	PPST	DEHA Solution	100 ml	46 11 81
			DEHA Tablet	100 ct.	51 32 20 BT
			Combi-Pack: DEHA Solution & DEHA Tablets	100 Tests	51 78 10 BT
DEHA	20 - 500 µg/l DEHA	PPST	VARIO DEHA-2 Reagent Solution	100 ml	53 14 10
			VARIO Oxyscav-1 Reagent	100 ct.	53 14 00
			VARIO DEHA Reagent Set	100 Tests	53 60 00
Fluoride	0.05 - 1.5 mg/l F	SPADNS	SPADNS Reagent	250 ml	46 74 81
				500 ml	46 74 82
			Fluoride Standard, 1 mg/l	30 ml	20 56 30
Formaldehyde	1 - 5 mg/l HCHO	H ₂ SO ₄ /Chromotropic Acid	Formaldehyde Reagent Set	50-75 Tests	42 07 51
	0.02 - 1 mg/l HCHO				
Formaldehyde	0.1 - 5 mg/l HCHO	H ₂ SO ₄ /Chromotropic Acid	Formaldehyde Reagent Set	25 Tests	42 07 52
Hardness, Total	2 - 50 mg/l CaCO ₃ 20 - 500 mg/l CaCO ₃	Metallpthalein	Hardcheck P Tablet	100 ct.	51 56 60 BT
Hazen (Color of Water)	0 - 500 Pt.Co. Units	Platinum Cobalt	Direct Reading - no reagents required		
Hydrazine	0.05 - 0.5 mg/l N ₂ H ₄	Dimethylamino-benzaldehyde	Hydrazine Test Powder	30 g	46 29 10
			Spoon	1 ea.	38 49 30
			Hydrazine Reagent Set	100 Tests	51 78 30
Hydrazine	0.005 - 0.6 mg/l N ₂ H ₄	Dimethylamino-benzaldehyde	VARIO Hydra 2 Reagent Solution	100 ml	53 12 00
Hydrogen Peroxide	0.01 - 0.5 mg/l H ₂ O ₂ 0.1 - 1 mg/l H ₂ O ₂	DPD / Catalyst	Hydrogen Peroxide LR Tablet	100 ct.	51 23 80 BT

Parameter	Range	Method	Reagent	Qty	Reagent P/N
Iodine	0.05 - 3.6 mg/l I	DPD	DPD No. 1 Tablet	100 ct.	51 10 50 BT
Iron (II, III)	0.01 - 0.5 mg/l Fe 0.1 - 1 mg/l Fe	PPST	Iron LR Tablet	100 ct.	51 53 70 BT
			Iron (II) LR Tablet	100 ct.	51 54 20 BT
Iron (II, III)	0.1 - 3 mg/l Fe	1, 10-Phenanthroline	VARIO Iron Ferro Reagent, F10	100 ct.	53 05 60
Iron, Total	0. - 1.8 mg/l Fe	TPTZ	VARIO Iron TPTZ Reagent, F10	100 ct.	53 05 50
Lead	0.1 - 5 mg/l pB	4-(2-Pyridylazo)-resorcline	Lead Reagent Set	50 Tests	42 07 53
Lead	0.1 - 5 mg/l Pb	4-(2-Pyridylazo)-resorcline	Lead Reagent Set	25 Tests	42 07 54
Manganese	0.2 - 4 ml/l Mn	Formaloxime	Manganese LR No. 1 Tablet	100 ct.	51 60 80 BT
			Manganese LR No. 2 Tablet	100 ct.	51 60 90 BT
			Combi-Pack: Manganese LR No. 1 / LR No. 2	100 Tests	51 76 21 BT
Manganese	0.01 - 0.7 mg/l Mn	PAN	VARIO Ascorbic Acid Reagent	100 ct.	53 11 00
			VARIO Alkaline Cyanide Reagent Solution	60 ml	53 06 20
			VARIO PAN Indicator Solution	60 ml	53 06 30
			VARIO LR Manganese Reagent Set, F10	50 Tests	53 50 90
			VARIO Rochelle Salt Solution	30 ml	L530640
				500 ml	L530642
Manganese	0.1 - 18 mg/l Mn	Periodate Oxidation	VARIO Manganese Citrate Buffer Reagent, F10	100 ct.	53 06 50
			VARIO Sodium Periodate Reagent, F10	100 ct.	53 06 60
			VARIO HR Manganese Reagent Set, F10	100 Tests	53 51 00
Molybdate / Molybdenum 1 - 30 mg/l MoO ₄		Thioglycolate	Molybdate No. 1 HR Tablet	100 ct.	51 30 60 BT
			Molybdate No. 2 HR Tablet	100 ct.	51 30 70 BT
			Combi-Pack: Molybdate No. 1 HR / No. 2 HR	100 Tests	51 76 31 BT
Molybdate / Molybdenum 0.5 - 5 mg/l MoO ₄		Mercaptoacetic Acid	VARIO Molybdenum 1 LR Reagent, F20	100 ct.	53 08 10
			VARIO Molybdenum 2 LR Reagent Solution	50 ml	53 08 20
			VARIO Molybdate Reagent Set, Low Range	100 Tests	53 54 50
			Required Accessory: Mixing Cylinder, 25 ml (Glass)	1 Ea.	19 80 26 50
Molybdate / Molybdenum 0.5 - 66 mg/l MoO ₄		Mercaptoacetic Acid	VARIO Molybdenum HR 1 Reagent, F10	100 ct.	53 07 50
			VARIO Molybdenum HR 2 Reagent, F10	100 ct.	53 07 60
			VARIO Molybdenum HR 3 Reagent, F10	100 ct.	53 07 70
			VARIO HR Molybdenum Reagent Set, F10	100 Tests	53 53 00
Monochloramines	0.04 - 4.5 mg/l Cl ₂	Indophenol	VARIO Monochlor F Reagent	100 ct.	53 18 10
Nickel	0.02 - 1 mg/l Ni 0.2 - 7 mg/l Ni	Dimethylgloxime	Nickel-51	10 gm.	--
			Nickel-52	10 ml	--
			Nickel Reagent Set	50 Tests	2 41 90 33

Parameter	Range	Method	Reagent	Qty	Reagent P/N
Nitrate	1 - 30 mg/l N	Chromotropic Acid	VARIO Nitra X Reagent Tube, Reagent A	50 ct.	--
			VARIO Nitra X Chromotropic, Reagent B	50 ct.	53 05 90
			Deionized Water (for Zero)	100 ml	--
			Nitrate Tube Test Reagent Set	25 Tests	53 55 80
Nitrate	0.5 - 14 mg/l N	2,6-Dimethyphenole	Nitrate Tube Tests	24 ct.	--
			Calibration Tube	2 ct.	--
			Nitrate-111 Solution	7 ml	--
			Nitrate / Nitrite-N Tube Test	24 Tests	2 42 07 02
Nitrite	0.01 - 0.5 mg/l N	N-(1-Naphthyl)-ethylenediamine	Nitrite LR Tablet	100 ct.	51 23 10 BT
Nitrite	0.03 - 0.6 mg/l N 0.3 - 3 mg/l N	Sulfanilic / Naphthylamine	Nitrite Tube Tests	24 ct.	--
			Calibration Tube	2 ct.	--
			Nitrite-101 Solution	7 ml	--
			Nitrite / Nitrite-N Tube Test	24 Tests	2 41 90 18
Nitrite	0.01 - 0.3 mg/l N	Diazotation	VARIO Nitrite 3 Reagent, F10	100 ct.	53 09 80
Nitrogen, Total	0.5 - 14 mg/l N 5 - 140 mg/l N	2,6-Dimethyphenole	Nitrate Tube Tests	24 ct.	--
			Calibration Tube	2 ct.	--
			Nitrate-111 Solution	7 ml	--
			Digestion Reagent Total Nitrogen	4.5 gm.	--
			Compensation Reagent Total Nitrogen	1.5 gm.	--
			Nitrogen, Total Tube Test	24 Tests	2 42 07 03
Nitrogen, Total	0.5 - 25 mg/l N	Persulfate-Digestion	VARIO Total N Persulfate Reagent	50 ct.	53 03 70
			VARIO Total Nitrogen Reagent A	50 ct.	--
			VARIO Total Nitrogen Reagent B	50 ct.	--
			VARIO Total Nitrogen Hydroxide LR Tubes	50 ct.	--
			VARIO Total Nitrogen Acid LR / HR Tubes	50 ct.	--
			VARIO Deionized Water (for Zero)	100 ml	--
			VARIO LR Total Nitrogen Reagent Set	25 Tests	53 55 50
		Required Accessory:	RD 125 Reactor	1 Ea	2 41 89 40
Nitrogen, Total	5 - 150 mg/l N	Persulfate-Digestion	VARIO Total N Persulfate Reagent	50 ct.	53 03 70
			VARIO Total Nitrogen Reagent A	50 ct.	--
			VARIO Total Nitrogen Reagent B	50 ct.	--
			VARIO Total Nitrogen Hydroxide HR Tubes	50 ct.	--
			VARIO Total Nitrogen Acid LR / HR Tubes	50 ct.	--
			VARIO Deionized Water (for Zero)	50 ct.	--
			VARIO HR Total Nitrogen Reagent Set	25 Tests	53 55 60
		Required Accessory:	RD 125 Reactor	1 Ea.	2 41 89 40
Ozone	0.02 - 1 mg/l O ₃ 0.02 - 0.5 mg/l <i>Required if testing in the presence of chlorine:</i>	DPD / Glycine	Combi-Pack: DPD No. 1 / DPD No. 3	100 Tests	51 77 11 BT
			Glycine Tablet	100 ct.	51 21 70 BT
Phenols	0.1 - 5 mg/l C ₆ H ₅ O _H	4-Aminoantiprine	Phenol No. 1 Tablet	100 ct.	51 59 50
			Phenol No. 2 Tablet	100 ct.	51 59 60
			Combi-Pack: Phenol No. 1 / No. 2	100 Tests	51 78 20

Parameter	Range	Method	Reagent	Qty	Reagent P/N
Phosphate, Total	0.07 - 3 mg/l P 0.2 - 10 mg/l PO ₄	Phosphomolybdic Acid / Ascorbic Acid	Reaction Tube, LR		--
			Phosphate-101 Calibration Tube	2 ct.	--
			Phosphate-102 Solution		--
			Phosphate-103 Reagent		--
			Phosphate, Total LR Tube Test	24 Tests	2 41 90 19
Phosphate, Total	1.5 - 20 mg/l P 5 - 60 mg/l PO ₄	Phosphomolybdic Acid / Ascorbic Acid	Reaction Tube, HR		--
			Phosphate-101 Calibration Tube	2 ct.	--
			Phosphate-102 Solution		--
			Phosphate-103 Reagent		--
			Phosphate, Total HR Tube Test	24 Tests	2 42 07 00
Phosphate, Ortho	0.05 - 4 mg/l PO ₄	Phosphomolybdic Acid / Ascorbic Acid	Phosphate No. 1 LR Tablet	100 ct.	51 30 40
			Phosphate No. 2 LR Tablet	100 ct.	51 30 50 BT
			Combi-Pack: Phosphate No. 1 LR / No. 2 LR	100 Tests	51 76 51 BT
Phosphate, Ortho	1 - 80 mg/l PO ₄	Vanadomolybdate	Phosphate No. 1 HR Tablet	100 ct.	51 58 10
			Phosphate No. 2 HR Tablet	100 ct.	51 58 20
			Combi-Pack: Phosphate No. 1 HR / No. 2 HR	100 Tests	51 76 61
Phosphate, Ortho	0.06 - 2.5 mg/l PO ₄	Phosphomolybdenum Blue / Ascorbic Acid	VARIO Phosphate 3 Reagent, F10	50 ct.	53 15 51
				100 ct.	53 15 50
				1000 ct.	53 15 53
Phosphate, Ortho	0.06 - 5 mg/l PO ₄	Phosphomolybdenum Blue / Ascorbic Acid	VARIO Dilution Vial	50 ct.	--
			VARIO Phosphate 3 Reagent, F10	50 ct.	53 15 51
			VARIO Deionized Water (for Zero)	100 ml	--
			VARIO Ortho Phosphate Reagent Set	50 Tests	53 52 00
Phosphate, Ortho	3 - 60 mg/l PO ₄	Vanadomolybdate	Phosphate, Ortho Tube Test	24 Tests	2 42 07 01
			Calibration Tube	2 ct.	--
Phosphate, Total	0.02 - 1.1 mg/l P 0.06 - 3.5 mg/l PO ₄	Persulfate Digestion: Phosphomolybdenum Blue / Ascorbic Acid	Acid Reagent Vial	50 ct.	--
			Phosphate 3 Reagent, F10	50 ct.	53 15 51
			Deionized Water (for Zero)	100 ml	--
Acid Hydrolyzable	0.02 - 1.6 mg/l P 0.06 - 5 mg/l PO ₄	Persulfate Digestion: Phosphomolybdenum Blue / Ascorbic Acid	Sodium Hydroxide, 1 N	100 ml	53 15 20
			Sodium Hydroxide, 1.54 N	100 ml	53 15 30
			Potassium Persulfate Reagent, F10	50 ct.	53 15 60
			VARIO Phosphorous, Total & Acid Hydrolyzable Reagent Set	50 Tests	53 52 50
		Required Accessory:	RD 125 Reactor	1 Ea.	2 41 89 40
Phosphate, Total	0.02 - 1.1 mg/l P 0.06 - 3.5 mg/l PO ₄	Acid / Persulfate Digestion Ascorbic Acid	VARIO Acid Reagent Vial	50 ct.	--
			VARIO Phosphate 3 Reagent, F10	50 ct.	53 15 51
			VARIO Deionized Water (for Zero)	100 ml	--
			VARIO Sodium Hydroxide, 1.54 N	100 ml	53 15 30
			VARIO Potassium Persulfate Reagent, F10	50 ct.	53 15 60
			Phosphate, Total Reagent Set	50 Tests	53 52 10
		Required Accessory:	RD 125 Reactor	1 Ea.	2 41 89 40

Parameter	Range	Method	Reagent	Qty	Reagent P/N
Phosphonate	0.02 - 125 mg/l PO ₄	Persulfate UV Oxidation	VARIO Potassium Persulfate, F10	100 ct.	53 15 60
			VARIO Phosphate 3 Reagent, F10	2 x 100 ct.	53 15 50
			VARIO Phosphonate Reagent Set	100 Tests	53 52 20
			Required Accessories: UV Lamp & Power Supply (110 v)	1 Ea.	40 07 45
			UV Lamp & Power Supply (220 v)	1 Ea.	40 07 40
			Mixing Cell with lid	1 Ea.	40 07 60
pH	5.5 - 8.4 pH	Phenol Red	Phenol Red Photometer Tablet	100 ct.	51 17 70 BT
pH	6.5 - 8.4 pH	Phenol Red	Phenol Red Solution	15 ml	47 10 40
Potassium	1 - 10 mg/l K	Tetraphenylborate - Turbidity	Potassium T Tablet	100 ct.	51 56 70
Silica	0.05 - 3 mg/l SiO ₂	Silicomolybdate	Silica No. 1 Tablet	100 ct.	51 31 30
			Silica No. 2 Tablet	100 ct.	51 31 40
			Combi-Pack: Silica No. 1 / No. 2	100 Tests	51 76 71
			Silica PR Tablet (in presence of phosphate)	100 ct.	51 31 50
Silica	0.1 - 1.6 mg/l SiO ₂	Heteropolyblue	VARIO Amino Acid F Reagent, F10	100 ct.	53 16 00
			VARIO Citric Acid Reagent, F10	2 x 100 ct.	53 17 10
			VARIO Molybdate 3 Reagent Solution	2 x 50 ml	53 17 30
			VARIO Silica LR Reagent Set, 10 ml Sample	100 Tests	53 56 90
Silica	1 - 100 mg/l SiO ₂	Silicomolybdate	VARIO Silica HR Molybdate, F10	100 ct.	53 17 00
			VARIO Silica HR Acid Reagent, F10	100 ct.	53 17 10
			VARIO Silica HR Citric Acid, F10	100 ct.	53 17 20
			VARIO Silica HR Reagent Set, 10 ml Sample	100 Tests	53 57 00
Spectral Absorption-Coefficient	0 - 50 m ⁻¹	ISO 7887:1994	No Reagents Required		
Sulfate	2 - 100 mg/l SO ₄	Bariumsulfate Turbidity	Sulfa 4 Reagent, F10	100 ct.	53 21 60
Sulfide	0.04 - 0.5 mg/l S	DPD / Catalyst	Sulfide No. 1 Tablet	100 ct.	50 29 30
			Sulfide No. 2 Tablet	100 ct.	50 29 40
			Combi-Pack: Sulfide No. 1 / No. 2	100 Tests	51 78 40
Sulfite	0.1 - 5 mg/l SO ₃ 0.05 - 4 mg/l SO ₃	DTNB	Sulfite LR Tablet	100 ct.	51 80 20 BT
Surfactants Anionic	0.05 - 2 mg/l MBAS	Methylene Blue	Reaction Tubes	25 ct.	--
			Calibration Cell	1 ea.	--
			2 liquid reagents		--
			Tenside Tube Test	25 Tests	42 07 55
Suspended Solids	5 - 750 mg/l	Turbidity / Attenuated Radiation Method	No Reagents Required		

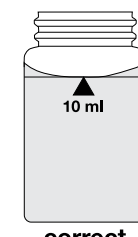
Parameter	Range	Method	Reagent	Qty	Reagent P/N
TOC	50 - 800 mg/l TOC	H ₂ SO ₄ / Indicator	Reaction Tubes	25 ct.	--
			Calibration Tube	1 ea.	--
			2 reagents (1 powder, 1 liquid)		--
			TOC Tube Test	25 Tests	42 07 56
Turbidity	0 - 1000	Attenuated Radiation Method	No Reagents Required		
Urea	0.1 - 2 mg/l CH ₄ N ₂ O	Urease / Indophenol	Urea Reagent 1	15 ml	45 93 00
			Urea Reagent 2	10 ml	45 94 00
			Ammonia No. 1 Tablet	100 ct.	51 25 80 BT
			Ammonia No. 2 Tablet	100 ct.	RS5500
			Urea Reagent Set	100 Tests	51 78 00 BT
Zinc	0.02 - 0.5 mg/l Zn	Zincon / EDTA	Copper / Zinc LR Tablet	100 ct.	51 26 20 BT
			EDTA Tablet	100 ct.	51 23 90 BT
			Dechlor Tablet	100 ct.	51 23 50 BT
			Combi-Pack: Copper / Zinc LR, EDTA & Dechlor	100 Tests	51 79 20 BT

Helpful Testing Techniques

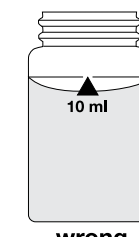
Accurate measurements depend on good and consistent measurement techniques. Be sure to always use clean samples vials in good condition (no scratches, cracks, or fingerprints) and remove air bubbles that may be clinging to the sample cell wall. Samples should be measured immediately to prevent changes in sample characteristics due to temperature shifts and settling.



Take a representative sample in a clean container. This ensures that you are testing the "same" water for all of your tests.

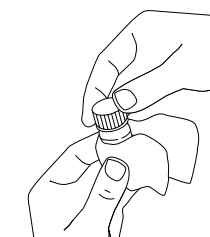


correct

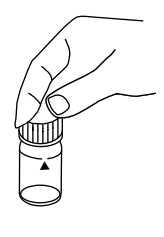


wrong

Always fill the sample cell so that the bottom of the meniscus is at the sample volume line.



Before inserting the sample cell into the instrument, wipe the vial with a smooth and lint-free cloth to remove water drops and fingerprints that may be present.



Fingerprints on the sample cell can skew results. Always hold the sample vial by the cap.

VARIO CROSS REFERENCE LIST



Online Chlorine
Analyzer Reagents



PD250 Dispenser



Powder Packs



Nitrification
Inhibitor

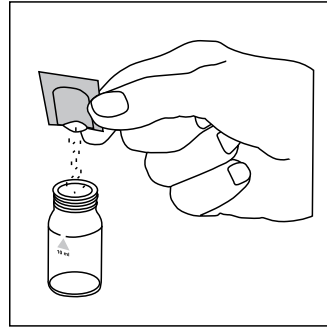


Liquids



Tube Tests

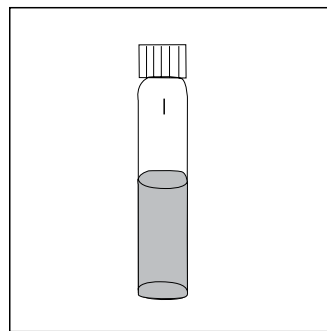
The Lovibond line of VARIO chemistries has been formulated for use in our test kits and instruments. They also have the advantage of being suitable for use in other manufacturer's instruments, test kits and other devices.



VARIO powder pack reagents are pre-measured unit dose reagents in a convenient foil pack -- simply tear open the powder pack and pour the reagent into the sample.

We think you will find them to be:

- **Easy to Handle** – Our powder packs are 37% larger than the competition which makes them easier to handle, especially by people with larger hands
- **Easy to Open** – Our powder packs have a defined "Easy Open Notch" that makes it simple to tear open the package. No scissors are necessary, as are sometimes required with the competitive product.
- **Easy to Dispense and Pour** – Our powder packs easily create a "V" to allow the user to pour the powder into the sample cell.



VARIO tube test reagents are an all liquid reagent and come pre-measured in a sample cell -- add your sample to the tube provided and you're ready to test!

By providing the precisely measured reagent in the sample cell, it eliminates the possibility of incorrect dilutions and keeps the user safe from having to directly handle potentially hazardous chemicals.

It will be noted that some of the tube test reagents, such as COD and total phosphate, need to be heated to a specified temperature in order to digest the sample.

Online Chlorine Analyzer Reagents

Our free and total chlorine reagent sets for process chlorine analyzer will give comparable results when used in the HACH® CL17™* and other manufacturers' online chlorine analyzers.

- Cut Cost, Not Quality - proven quality at competitive prices
- Supplies enough reagent for 30 Days of continuous operation
- Packaged in similar sized bottles to fit directly into the HACH® CL17™*

Ordering Information

Item	P/N
Free Chlorine Reagent Set for Process Chlorine Analyzer Includes DPD Indicator Powder, Free Chlorine Indicator Solution and Free Chlorine Buffer Solution	53 02 10
Total Chlorine Reagent Set for Process Chlorine Analyzer Includes DPD Indicator Powder, Total Chlorine Indicator Solution and Total Chlorine Buffer Solution	54 02 10
DPD Indicator Powder, 24 g	53 02 20
Free Chlorine Indicator Solution, 473 ml	53 02 22
Free Chlorine Buffer Solution, 473 ml	53 02 23
Total Chlorine Indicator Solution, 473 ml	54 02 22
Total Chlorine Buffer Solution, 473 ml	54 02 23



*HACH® is a registered trademark of HACH® Company, Loveland, Colorado. The use of the HACH® trademark does not imply any affiliation with or approval by HACH® Company regarding the formulation, testing or suitability of these products for use in HACH® brand spectrophotometers, or other devices or systems.



PD250 DPD Dispenser

The PD250 is designed for easy and controlled dosage of DPD powder reagents. Simply squeeze the handle and the exact amount of reagent required for a 10 ml sample is dispensed. The PD250 is the perfect alternative to the Powder Packs for those carrying out numerous tests, saving time while also reducing the amount of packaging waste.

The vials can quickly and easily be changed and the dispenser can be thoroughly cleaned. It's also ergonomically designed.

Our DPD reagents are comparable to Hach® DPD reagents*, at a more economical price. Already using the HACH® SwiftTest™? Our reagent refill vials fit perfectly!

Ordering Information

Item	P/N
DPD Free Chlorine Reagent Dispenser Includes PD250 Dispenser and 1 vial of DPD Free Chlorine Reagent (250 tests)	19 49 00
DPD Total Chlorine Reagent Dispenser Includes PD250 Dispenser and 1 vial of DPD Total Chlorine Reagent (250 tests)	19 49 10
PD250 Reagent Refill, Free Chlorine 250 Tests	53 01 41
2 x 250 Tests	53 01 40
PD250 Reagent Refill, Total Chlorine 250 Tests	53 01 51
2 x 250 Tests	53 01 50
PD250 Reagent Refill, Free & Total Chlorine Includes 1 vial each of DPD Free & Total Chlorine Reagent (250 tests per vial)	53 01 60

VARIO Cross Reference

PD260 Nitrification Inhibitor Dispenser

Nitrification inhibitor is used to inhibit nitrogenous oxygen demand in a BOD test.

The PD260 comes with reagents comparable to the HACH® nitrification inhibitor*, and makes it easier than ever to measure out nitrification inhibitor for your BOD sample.

Simply squeeze the handle one time per 300 ml of sample and the perfect dosage is added.

Ordering Information

Item	P/N
Nitrification Inhibitor (TCMP) Powder Dispenser Set Includes PD260 Dispenser and 1 vial of Nitrification Inhibitor (35 Grams)	19 49 20
Nitrification Inhibitor (TCMP) Powder Refill Single Vial, 35 grams	53 01 71
Nitrification Inhibitor (TCMP) Powder Refill Two Vials, 35 grams each	53 01 70



VARIO Cross Reference List

Parameter	Range	Description	Qty.	Part Number	Comparable P/N
Aluminum	0 - 0.22 mg/l Al	VARIO ECR Reagent	100 ct.	53 16 20	2603849
		VARIO Hexamethylenetetramine Buffer	100 ct.	53 16 50	2603999
		VARIO ECR Masking Reagent	25 ml	53 16 25	2380123
		VARIO Aluminum Reagent Set	100 Tests	53 50 00	2603700
Ammonia	0 - 0.5 mg/l N	VARIO Ammonia Salicylate Reagent, F10	100 ct.	53 13 70	2653199
		VARIO Ammonia Cyanurate Reagent, F10	100 ct.	53 13 80	2653299
		VARIO Ammonia Nitrogen Reagent Set, F10	100 Tests	53 55 00	2668000
Ammonia LR	0 - 2.5 mg/l N	VARIO Ammonia Salicylate Reagent, F5	50 ct.	53 11 50	2395466
		VARIO Ammonia Cyanurate Reagent, F5	50 ct.	53 11 60	2395266
		VARIO LR Ammonia Diluent	50 ct.	--	--
		VARIO LR Ammonia Reagent Set, F5	25 Tests	53 56 00	2604545
Ammonia HR	0 - 50 mg/l N	VARIO Ammonia Salicylate Reagent, F5	50 ct.	53 11 50	2395466
		VARIO Ammonia Cyanurate Reagent, F5	50 ct.	53 11 60	2395266
		VARIO HR Ammonia Diluent	50 ct.	--	--
		VARIO HR Ammonia Reagent Set, F5	25 Tests	53 56 50	2606945
Ammonia, Free	0.01 - 0.5 mg/l N	VARIO Free Ammonia Reagent Solution	4 ml	53 18 00	2877336
		VARIO Monochlor F Reagent	100 ct.	53 18 10	2802299
		VARIO Ammonia, Free Reagent Set	100 Tests	53 58 00	2879700
Chlorine	Visual Test Kits	VARIO DPD Free Chlorine Reagent, F5	100 ct.	53 00 90	1407799
		VARIO DPD Free Chlorine Reagent, F5	1,000 ct.	53 00 93	1407728
	0.01 - 2 mg/l Cl ₂	VARIO DPD Total Chlorine Reagent, F5	100 ct.	53 00 80	1407699
		VARIO DPD Total Chlorine Reagent, F5	1,000 ct.	53 00 83	1407628
		VARIO DPD Free Chlorine Reagent, F10	100 ct.	53 01 00	2105569
		VARIO DPD Free Chlorine Reagent, F10	1,000 ct.	53 01 03	2105528
	0 - 5 mg/l Cl ₂	VARIO DPD Total Chlorine Reagent, F10	100 ct.	53 01 20	2105669
		VARIO DPD Total Chlorine Reagent, F10	1,000 ct.	53 01 23	2105628
		VARIO DPD Free Chlorine Reagent, F25	100 ct.	53 01 10	1407099
		VARIO DPD Free Chlorine Reagent, F25	1,000 ct.	53 01 13	1407028
	VARIO DPD Total Chlorine Reagent, F25	100 ct.	53 01 30	1406499	
	VARIO DPD Total Chlorine Reagent, F25	1,000 ct.	53 01 33	1406428	
COD LR	0 - 150 mg/l O ₂	VARIO LR COD Tube Test Reagents	25 ct.	2 42 07 20	2125825
		VARIO LR COD Tube Test Reagents	150 ct.	2 24 07 25	2125815
		VARIO LR COD Tube Test Reagents, Hg-Free	25 ct.	2 42 07 10	2565025
COD MR	0 - 1500 mg/l O ₂	VARIO MR COD Tube Test Reagents	25 ct.	2 42 07 21	2125925
		VARIO MR COD Tube Test Reagents	150 ct.	2 24 07 26	2125915
		VARIO MR COD Tube Test Reagents, Hg-Free	25 ct.	2 42 07 11	2565125
		VARIO MR COD Tube Test Reagents, Hg-Free	150 ct.	2 24 07 16	2565115
COD HR	0 - 15000 mg/l O ₂	VARIO HR COD Tube Test Reagents	25 ct.	2 42 07 22	2415925
		VARIO HR COD Tube Test Reagents	150 ct.	2 24 07 27	2415915
		VARIO HR COD Tube Test Reagents, Hg-Free	25 ct.	2 42 07 12	2834325

Parameter	Range	Description	Qty.	Part Number	Comparable P/N
Copper	0 - 5 mg/l Cu	VARIO Copper Reagent, F10	100 ct.	53 03 00	2105869
		VARIO Copper Reagent, F10	1,000 ct.	53 03 03	2105828
DEHA	20 - 500 µg/l DEHA	VARIO Oxyscav-1 Reagent	100 ct.	53 14 00	2167969
		VARIO DEHA 2 Reagent	100 ml	53 14 10	2168049
		VARIO DEHA Reagent Set	100 Tests	53 60 00	2446600
Hydrazine	0.005 - 0.6 mg/l N ₂ H ₄	VARIO Hydra-2 Reagent	100 ml	53 12 00	179032
Iron (Fe²⁺, Fe³⁺) Dissolved	0 - 3 mg/l Fe	VARIO Iron FERRO Reagent, F10	100 ct.	53 05 60	2105769
		VARIO Iron FERRO Reagent, F10	1,000 ct.	53 05 63	2105728
	0 - 1.8 mg/l Fe	VARIO Iron FERRO Reagent, F25	100 ct.	53 05 70	85499
		VARIO Iron FERRO Reagent, F25	1,000 ct.	53 05 73	85428
	VARIO Iron TPTZ Reagent, F10	100 ct.	53 05 50	2608799	
Manganese, LR	0 - 0.7 mg/l Mn	VARIO Alkaline-Cyanide Reagent Solution	60 ml	53 06 20	2122326
		VARIO Ascorbic Acid Reagent	100 ct.	53 11 00	1457799
		VARIO PAN Indicator Solution	60 ml	53 06 30	2122426
		VARIO Manganese LR Reagent Set	100 Tests	53 50 90	2651700
Manganese, HR	0 - 20 mg/ Mn	VARIO Manganese Citrate Buffer, F10	100 ct.	53 06 50	2107669
		VARIO Sodium Periodate Reagent, F10	100 ct.	53 06 60	2107769
		VARIO Manganese HR Reagent Set	100 Tests	53 51 00	2430000
Molybdate, LR	0.5 - 5 mg/l MoO ₄	VARIO Molybdenum 1 LR Reagent, F20	100 ct.	53 08 10	2352449
		VARIO Molybdenum 2 LR Reagent	50 ml	53 08 20	2352512
		VARIO Molybdenum LR Reagent Set	100 Tests	53 54 50	2449400
Molybdate, HR	0 - 35 mg/l Mo	VARIO Molybdenum HR 1 Reagent, F10	100 ct.	53 07 50	2604299
		VARIO Molybdenum HR 2 Reagent, F10	100 ct.	53 07 60	2604399
		VARIO Molybdenum HR 3 Reagent, F10	100 ct.	53 07 70	2604499
		VARIO Molybdenum HR Reagent Set, F10	100 Tests	53 53 00	2604100
	0 - 35 mg/l Mo	VARIO Molybdenum HR 1 Reagent, F25	100 ct.	53 07 80	1414669
		VARIO Molybdenum HR 2 Reagent, F25	100 ct.	53 07 90	1414869
VARIO Molybdenum HR 3 Reagent, F25		100 ct.	53 08 00	1417869	
	VARIO Molybdenum HR Reagent Set, F25	100 Tests	53 54 00	2243400	
Monochloramine	0.04 - 4.5 mg/l Cl ₂	VARIO Monochlor F Reagent, F10	100 ct.	53 18 10	2802299
Nitrate	0 - 30 mg/l N	VARIO Nitra X Reagent Tube, Reagent A	25 ct.	--	--
		VARIO Nitra X Chromotropic, Reagent B	50 ct.	53 05 90	2605546
		VARIO Nitrate Tube Test Reagent Set	25 Tests	53 55 80	2605345

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VARIO Cross Reference List

Parameter	Range	Description	Qty.	Part Number	Comparable P/N
Nitrogen, Total LR	0 - 25 mg/l N	VARIO Total N Persulfate Reagent	50 ct.	53 03 70	2671846
		VARIO Total Nitrogen Reagent A	50 ct.	--	--
		VARIO Total Nitrogen Reagent B	50 ct.	--	--
		VARIO Total Nitrogen Hydroxide LR Tubes	50 ct.	--	--
		VARIO Total Nitrogen Acid LR/HR Tubes	50 ct.	--	--
		VARIO Deionized Water	100 ml	--	--
		VARIO Total Nitrogen LR Reagent Set	25 Tests	53 55 50	2672245
Nitrogen, Total HR		VARIO Total Nitrogen Reagent A	50 ct.	--	--
		VARIO Total Nitrogen Reagent B	50 ct.	--	--
		VARIO Total Nitrogen Hydroxide HR Tubes	50 ct.	--	--
		VARIO Total Nitrogen Acid LR/HR Tubes	50 ct.	--	--
		Deionized Water	100 ml	--	--
				VARIO Total Nitrogen LR Reagent Set	25 Tests
Nitrite LR	0 - 0.3 mg/l N	VARIO Nitrite 3 Reagent, F10	100 ct.	53 09 80	2107169
		VARIO Nitrite 3 Reagent, F25	100 ct.	53 09 70	1406599
		VARIO Nitrite 3 Reagent, F25	1,000 ct.	53 09 73	1406528
Phosphate	0 - 2.5 mg/l	VARIO Phosphate 3 Reagent, F10	50 ct.	53 15 51	2106046
		VARIO Phosphate 3 Reagent, F10	100 ct.	53 15 50	2106069
		VARIO Phosphate 3 Reagent, F10	1,000 ct.	53 15 53	2106028
Phosphate, Ortho	0.06 - 5 mg/l PO ₄	VARIO Dilution Tube	50 ct.	--	--
		VARIO Phosphate 3 Reagent, F10	50 ct.	53 15 51	2106046
		Deionized Water	100 ml	--	--
		VARIO Reactive Phosphate Reagent Set	50 Tests	53 52 00	2742545
Phosphate Acid Hydrolyzable & Total	Acid Hydrolyzable: 0.02 - 1.6 mg/l P _Δ 0.06 - 5 mg/l PO ₄ Total: 0.02 - 1.1 mg/l P _Δ 0.06 - 3.5 mg/l PO ₄	VARIO Acid Reagent Vial	50 ct.	--	--
		VARIO Phosphate 3 Reagent, F10	50 ct.	53 15 51	2106046
		Deionized Water	100 ml	--	--
		VARIO Sodium Hydroxide, 1N	100 ml	53 15 20	104542
		VARIO Sodium Hydroxide, 1.54 N	100 ml	53 15 30	2743042
		VARIO Potassium Persulfate Reagent, F10	50 ct.	53 15 60	2084766
		VARIO Total & Acid Hydrolyzable Phosphate Reagent Set	50 Tests	53 52 50	2742745
Phosphate, Total	0.02 - 1.1 mg/l P _Δ 0.06 - 3.5 mg/l PO ₄	VARIO Acid Reagent Vial	50 ct.	--	--
		VARIO Phosphate 3 Reagent, F10	50 ct.	53 15 51	2106046
		Deionized Water	100 ml	--	--
		VARIO Sodium Hydroxide, 1N	100 ml	53 15 20	104542
		VARIO Potassium Persulfate Reagent	50 ct.	53 15 60	2084766
				VARIO Total Phosphate Reagent Set	50 Tests
Phosphonates	0.02 - 125 mg/l PO ₄	VARIO Potassium Persulfate Reagent, F10	100 ct.	53 15 60	2084766
		VARIO Phosphate 3 Reagent, F10	2 x 100 ct.	53 15 50	2106069
		VARIO Phosphonates Reagent Set	100 Tests	53 52 20	2429700
Silica, LR	0 - 1.6 mg/l SiO ₂	VARIO Amino Acid F Reagent	100 ct.	53 16 00	2254069
		VARIO Silica Citric Acid Reagent	100 ct.	53 17 10	2106269
		VARIO Molybdate 3 Reagent Solution	2 x 50 ml	53 17 30	199526
		VARIO Silica LR Reagent Set	100 Tests	53 56 90	2459300

Parameter	Range	Description	Qty.	Part Number	Comparable P/N
Silica, HR	0 - 100 mg/l SiO ₂	VARIO Silica HR Molybdate, F10	100 ct.	53 17 00	2107469
		VARIO Silica HR Acid Reagent, F10	100 ct.	53 17 10	2106269
		VARIO Silica HR Citric Acid, F10	100 ct.	53 17 20	2107369
		VARIO Silica HR Reagent Set, F10	100 Tests	53 57 00	2429600
Silica, UHR	0 - 200 mg/l SiO ₂	VARIO Silica HR Molybdate, F25	100 ct.	53 19 30	104299
		VARIO Silica HR Acid Reagent, F25	100 ct.	53 19 40	1454899
		VARIO Silica HR Citric Acid, F25	100 ct.	53 19 50	104199
		VARIO Silica HR Reagent Set, F25	100 ct.	53 59 00	2244300
Sulfate	0 - 70 mg/l SO ₄	VARIO Sulfate 4 Reagent, F10	100 ct.	53 21 60	2106769
		VARIO Sulfate 4 Reagent, F25	100 ct.	53 21 50	1206599
		VARIO Sulfate 4 Reagent, F25	1,000 ct.	53 21 53	1206528
Triazoles	1 - 16 mg/l Benzotriazole	VARIO Triazole Reagent, F25	100 ct.	53 22 00	2141299



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Digital Titrator Cartridges



Available for a wide variety of parameters, the Digital Titrator Cartridges are ideal for performing titrations in the field. No need for additional glassware!

Indicator Solutions

Certain Digital Titrator procedures require the use of Indicators.

Ordering Information

Item	P/N	Item	P/N
Acetate Buffer pH 4.0, 100 ml	R-5000-2	Phenolphthalein Indicator, 100 ml	R-5005-2
Bromocresol Green / Methyl Red, 100 ml	R-5001-2	Phosphate Buffer, pH 7, 100 ml	R-5006-2
Bromophenol Blue Indicator, 100 ml	R-5002-2	Potassium Hydroxide, 8.0 N, 100 ml	R-5007-2
Ferroun Indicator, 100 ml	R-5003-2	Sodium Thiosulfate, 0.00564 N, 100 ml	R-5008-2
Hardness Buffer, 100 ml	R-5004-2	Starch Indicator, 100 ml	R-5009-2
		Sulfuric Acid, 5.25 N, 100 ml	R-5010-2

Parameter	Range	Cartridge Description	Volume	Cartridge P/N
Acid - Base	10 - 4000 meq/l	Hydrochloric Acid, 8.00 N	13 ml	DT010-01
	10 - 4000 meq/l	DT Cartridge, H ₂ SO ₄ , 8.00 N	13 ml	DT011-03
	10 - 4000 meq/l	DT Cartridge, NaOH, 8.00 N	13 ml	DT012-06
Acidity	10 - 40 - 160 mg/l CaCO ₃	DT Cartridge, NaOH, 0.1600 N	13 ml	DT012-01
	100 - 4000 mg/l CaCO ₃	DT Cartridge, H ₂ SO ₄ , 1.600 N	13 ml	DT012-04
Alkalinity-P & Total	10 - 40 - 160 mg/l CaCO ₃	DT Cartridge, H ₂ SO ₄ , 0.1600 N	13 ml	DT011-01
	10 - 4000 mg/l CaCO ₃	DT Cartridge, H ₂ SO ₄ , 1.600 N	13 ml	DT011-02
Carbon Dioxide	10 - 50 - 100 mg/l CO ₂	DT Cartridge, NaOH, 0.3636 N	13 ml	DT012-02
	100 - 400 - 1000 mg/l CO ₂	DT Cartridge, NaOH, 3.636 N	13 ml	DT012-05
Chloride	10 - 40 - 100 mg/l Cl ⁻	DT Cartridge, AgNO ₃ , 0.2256 N	13 ml	DT013-01
	100 - 10,000 mg/l Cl ⁻	DT Cartridge, AgNO ₃ , 1.128 N	13 ml	DT013-02
	10 - 40 - 160 mg/l Cl ⁻	DT Cartridge, Hg(NO ₃) ₂ , 0.2256 N	13 ml	DT014-01
	100 - 8000 mg/l Cl ⁻	DT Cartridge, Hg(NO ₃) ₂ , 2.256 N	13 ml	DT014-02
Chlorine	0 - 1000 ppb	DT Cartridge, PAO, 0.00564 N	13 ml	DT023-01
	20 - 2000 mg/l as Cl ₂	DT Cartridge, Na ₂ S ₂ O ₃ , 0.113 N	13 ml	DT015-01
	0.2 - 0.9 - 1.8 - 3.5 - 7.0% as Cl ₂	DT Cartridge, Na ₂ S ₂ O ₃ , 2.00 N	13 ml	DT015-04
	0.01 - 3 mg/l as Cl ₂	DT Cartridge, FEAS, 0.00564 N	13 ml	DT016-01
	0 - 1000 ppb	DT Cartridge, Iodine titrant, 0.0282 N	13 ml	DT017-01
	(Sodium Hypochlorite) 50 - 150 g/l Cl ₂ / 5 - 15%	DT Cartridge, Na ₂ S ₂ O ₃ , 2.26 N	13 ml	DT015-05
Chromate	20 - 800 mg/l as [CrO ₄] ²⁻	DT Cartridge, Na ₂ S ₂ O ₃ , 0.2068 N	13 ml	DT015-03
EDTA, Residual	1 - 200 mg/l as 38% Na ₄	DT Cartridge, MgCl ₂ , 0.0800 N	13 ml	DT019-01
Hardness, Ca, Mg & Total	10 - 40 - 160 mg/l	DT Cartridge, EDTA, 0.0800 M	13 ml	DT020-01
	100 - 4000 mg/l	DT Cartridge, EDTA, 0.800 M	13 ml	DT020-04
	1 - 4 - 16 °dH	DT Cartridge, EDTA, 0.1428 M	13 ml	DT020-02
	10 - 40 - 25 - 100 - 200 °dH	DT Cartridge, EDTA, 0.714 M	13 ml	DT020-03
Iron	10 - 40 - 100 mg/l Fe	DT Cartridge, Hardness, 0.0716 M	13 ml	DT021-01
	100 - 400 - 1000 mg/l Fe	DT Cartridge, Hardness, 0.716 M	13 ml	DT021-02
Nitrite	100 - 2500 mg/l	DT Cartridge, Ceric 0.5 N	13 ml	DT022-01
Oxidants	0 - 0.5 meq/l	DT Cartridge, Na ₂ S ₂ O ₃ , 2.00 N	13 ml	DT015-04
Oxygen, Dissolved	1 - 5 - 10 mg/l as O ₂	DT Cartridge, Na ₂ S ₂ O ₃ , 0.2000 N	13 ml	DT015-02
	10 - 100 mg/l as O ₂	DT Cartridge, Na ₂ S ₂ O ₃ , 2.00 N	13 ml	DT015-04
Salinity	0.1 - 100 ppt salinity	DT Cartridge, Hg(NO ₃) ₂ , 2.570 N	13 ml	DT014-03
Sulfite	100 - 1600 mg/l as SO ₃ ²⁻	DT Cartridge, KIO ₃ / KI, 0.3998 N	13 ml	DT018-01
Volatile Acids	100 - 2400 Acetic Acid	DT Cartridge, NaOH, 0.9274 N	13 ml	DT012-03

BOD ANALYSIS



OxiDirect BOD System



The OxiDirect is a 6 sample system that takes precise measurements of BOD based on the manometric principle.

Manometric respirometers relate oxygen uptake to the change in pressure caused by oxygen consumption while maintaining a constant volume.

BOD – Biochemical Oxygen Demand – is an expression for the quantity of oxygen required for biological degradation of organic matter in a waste water sample. BOD Measurement is used for the detection of biologically degradable organic matter in water. The difference between BOD and COD (chemical oxygen demand) is that COD also measures biologically non-degradable organic matter.

Our intuitive, user-friendly control panel makes selecting a sample bottle and displaying data as easy as pushing a button.

OxiDirect BOD System meets Standard Methods 5210.

Highlights

- Direct sample selection
- Accurate and direct display of BOD values in mg/l
- User-friendly handling
- User-selectable measuring period from 1 to 28 days (BOD₅, BOD₇, OECD...)
- Automatic storage of all values
- Measuring ranges from 0-40 mg/l to 0-4000 mg/l BOD, sample volume related
- Auto start function after temperature equalization
- Mercury-free, environmentally-friendly
- Inductive stirring system with automatic re-centering of stirring rods
- Interface RS 232

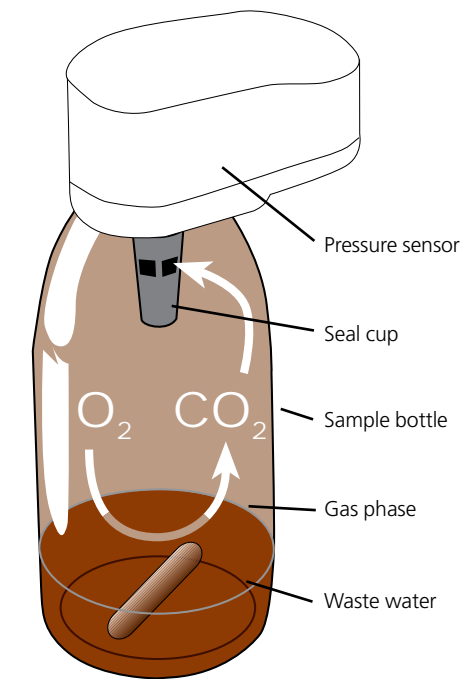
Biochemical Oxygen Demand (BOD)

BOD – biochemical oxygen demand – is an expression for the quantity of oxygen required for biological degradation of organic matter in a waste water sample. BOD measurement is used as a basis for the detection of biologically degradable organic matter in water. The difference between BOD and chemical oxygen demand (COD) is that COD additionally registers biologically non-degradable organic matter.

BOD measurement is an important measurement of the effects of domestic and industrial waste water on sewage plants and outflow points.

Manometric, respirometric BOD measurement using the OxiDirect

The OxiDirect is a 6 sample system that allows precise measurements of BOD based on the manometric principle. Manometric respirometers relate oxygen uptake to the change in pressure caused by oxygen consumption while maintaining a constant volume. Thanks to the integral pressure sensors, it is no longer necessary to use mercury for pressure measurements.



OxiDirect Principle

Respirometric methods provide direct measurements of the oxygen consumed by microorganisms from an air or oxygen-enriched environment in a closed vessel under conditions of constant temperature and agitation. Carbon dioxide produced metabolically by the bacteria is chemically bound by the potassium hydroxide solution contained in the seal cup in the bottle.

The result is a pressure drop in the system, which is directly proportional to the BOD value and is measured by the BOD sensor. The BOD level is then displayed directly in mg/l.

The BOD values are stored in the sensor memory and can be called up on the large-format display at any time without the need for time-consuming conversion using factors. This means that test series that end on a Sunday can be evaluated during the following week without any problem.

The measurement period is user-selectable between 1 and 28 days to suit the application. While short measurement periods are useful for scientific applications, standard BOD measurements typically extend over a period of 5 days – and manometric determination of OECD, for example, generally takes place over a period of 28 days.

Measuring ranges and sample volumes

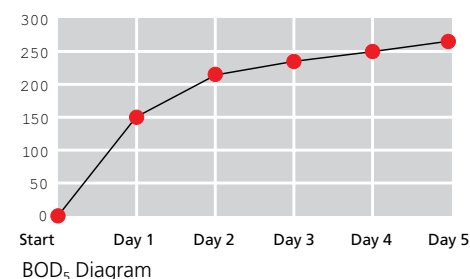
The BOD level of a sample depends on the quantity of organic matter present, which can vary considerably. The OxiDirect is calibrated for the various sample volumes and the corresponding measuring ranges listed in the table. The overall measuring range of the system is 0 – 4000 mg/l.

For all measuring ranges, BOD is shown directly in mg/l.

Range mg / l BOD	Sample Volume ml
0– 40	428
0– 80	360
0– 200	244
0– 400	157
0– 800	94
0–2000	56
0–4000	21.7



Day	Display
1. Day	150 mg/l
2. Day	220 mg/l
3. Day	240 mg/l
4. Day	250 mg/l
5. Day	260 mg/l



Applications

- Waste Water
- Determination of Biological Activity
- Waste Water Treatment Plants
- Analytical Laboratories
- Science & Research

References

- APHA, AWWA, WEF Standard Methods 5210 D
- H55 as a supplement to EN 1899-2

Evaluation of measurements

If the measuring period is set at 24 hours, the OxiDirect BOD measuring system records a measurement once every hour. With a measuring period of 48 hours, the unit measures and stores a BOD value once every 2 hours. If the measuring period is between 3 and 28 days, one value is measured and stored each day.

Current values and stored values may be called up at any time. The table/graph below illustrates an example of BOD₅ evaluation. The development of BOD over a period of 5 days is easily seen.

Automatic start function

Variations in sample temperature prior to testing result in pressure variations within the measuring system during the temperature equalization period in the thermostatically controlled cabinet (if BOD measurement is to take place at 20°C, for example). Such variations would normally cause errors during manometric measurement. In order to prevent such errors, the OxiDirect BOD meter is equipped with an automatic start feature: measurement does not begin until the temperature in the samples is the same as that in the thermostatically controlled cabinet. This rules out the possibility of temperature (and hence pressure) fluctuations that are not related to the manometric measurement.

The complete OxiDirect measuring system

In addition to the BOD unit for measurement and storage of BOD levels, the OxiDirect BOD measuring system includes sample bottles, measuring sensors, non-wearing inductive stirring system, overflow measuring flasks for metering of sample volumes, nitrification inhibitor and potassium hydroxide as an absorbent.

Specifications

Meas. principle	Manometric; mercury-free; electronic pressure sensor
Ranges [mg/l O₂]	0 - 40, 0 - 80, 0 - 200, 0 - 400, 0 - 800, 0 - 2000, 0 - 4000 mg/l
Accuracy*	0.5 % full scale at 20°C
Applications	BOD ₅ , BOD ₇ , OECD 301 F ...
Result display	BOD [mg/l]; 4 - digits; 7 - segment LED
Measurement parameter display	BOD-range, volume, duration, time of measurement
Measurement period	User-selectable, between 1 and 28 days
Auto result storage	Up to 28 results, depending on measurement period
Storage interval	- hourly (1 day); - every 2 hours (2 days); - daily (3-28 days)
Automatic start function	- After temperature equalization of samples; - Can be switched off
Power supply	3 alkaline-manganese batteries ("Baby" cells/size "C")
Battery life	1 year (normal use as BOD ₅ meter - max. one reading a day); early warning before battery fails
Interface	RS 232 for printer or PC connection
Clock	Real-time clock
Protection class	IP 54 (sensor head)
Dimensions: (L x W x H)	375 x 195 x 230 mm including stirring unit
Weight	3850 g, unit with bottles 5750 g, complete with stirring unit
Housing	ABS
Approval	CE

*No standard is available to check the accuracy of respirometric oxygen uptake measurement. Tests with a glucose-glutamic acid solution having a known theoretical BOD have shown that the variation is approximately 5% in the range of 50...100 mg/l BOD, and 3% for higher range. Minimum Response or sensitivity of respirometric systems is about 0.05 ... 1 mg/l.

Ordering Information

Item	P/N
OxiDirect BOD System 6 Sensor Heads	2 44 44 06
115V / 230V, 50-60 Hz, 50-60 Hz Includes: control unit with batteries, inductive stirring system with power supply, 6 each of the sensor heads, sample bottles, rubber gaskets, magnetic stirring rods, 1 overflow flask (157 ml), 1 overflow flask (428 ml), and 1 bottle each (50 ml) of the Potassium Hydroxide Solution and Nitrification Inhibitor Solution, and serial cable for data transfer.	
OxiDirect BOD System 12 Sensor Heads	2 44 44 10
115V / 230V, 50-60 Hz, 50-60 Hz Includes: 2 control units with batteries, 2 inductive stirring systems with power supply, 12 each of the sensor heads, sample bottles, rubber gaskets, magnetic stirring rods, 1 overflow flask (157 ml), 1 overflow flask (428 ml), and 1 bottle each (50 ml) of Potassium Hydroxide Solution and Nitrification Inhibitor Solution, and serial cable for data transfer.	
Sensor head	2 44 44 30
BOD sample bottle Brown glass, 500 ml	41 86 44
BOD sample bottles , Brown glass, 500 ml, set of 6 bottles	41 86 45
Cable for connection to a PC serial 9-pins	2 44 44 40
Inductive stirring system for 6 samples, 100-240 V / 50-60 Hz	2 44 44 52
Stirring rod	41 86 37
Stirring rod remover	41 86 38
Rubber gasket	41 86 36
Potassium hydroxide solution 45 %, 50 ml	2 41 86 34
Nitrification inhibitor (N-ATH) 50 ml	2 41 86 42
Overflow flask, 21.7 ml	41 86 64
Overflow flask, 56 ml	41 86 55
Overflow flask, 94 ml	41 86 56
Overflow flask, 157 ml	41 86 57
Overflow flask, 244 ml	41 86 58
Overflow flask, 360 ml	41 86 59
Overflow flask, 428 ml	41 86 60
Complete set Overflow flasks	41 86 54
Test set , BOD CM test tablets, box with 8 tablets	41 83 28

Test set for OxiDirect

We also supply a test set to check for correct operation of the OxiDirect BOD meter. The set contains 8 BOD CM1 test tablets that cause a defined oxygen consumption.

The tablets are easy to use. Simply place a tablet in the BOD bottle, start the measurement process, read off the BOD value after 5 days, and then compare with the defined value. If this value is within the quoted tolerance, this means that the BOD measuring system is functioning correctly.



BOD CM test tablets, order code: L418328

Temperature equalization during BOD measurement

Temperature equalization is essential prior to biological testing, as temperature has a major effect on biological activity. BOD measurements, for example, are always performed in a thermostatically controlled cabinet at a temperature of 20°C.

Inductive stirring system



Inductive stirring system

The microprocessor-controlled inductive stirring system is non-wearing and maintenance-free. In other words, there are no moving parts in the system.

At regular intervals, the magnetic stirring rods are accelerated and slowed down again, taking them up to maximum speed and back down again. This ensures the centralization of the stirring rods.

Stirring rods that move away from the center of the bottle are re-centered quickly and reliably.

The inductive actuation system guarantees maintenance-free operation (no need to replace drive belts or burnt-out drive motors) for many years.



E-CHEM

pH • ORP • CONDUCTIVITY • DO •

TDS • SALT



SD Series (IP 67 waterproof)



The instruments in the SD Series of E-Chem Testers are ideal for field testing in environmental or industrial settings as well as for pool and spa testing!

The robust housing is completely waterproof (IP67 rated!) and the intuitive scroll-bar functionality combined with a backlit display enable the easy measurement and simultaneous display of:

- Result
- Temperature
- Date & Time

With 25 sets of data storage, each with date and time stamp, the units also enables the easy recall of data for record keeping requirements. Designed and manufactured according to Lovibond® quality standards, with replaceable electrodes to ensure long-life functionality in the field.



Highlights

- Portable Hand-Held E-Chem Tester
- Scroll driven menu system
- Compact & Robust
- Storage Function
- Backlit Display
- Waterproof (IP67)

Delivery Content

- Durable plastic case with hanger
 - 2 Batteries
 - Lanyard
 - Instruction Manual
- With SD 50 pH only:
- pH 4, 7, 10 buffer tablets (1 strip of 10 tablets each)

SD 50 pH

Range	0 - 60 °C, 0 - 14 pH
Resolution	0.01 pH
Accuracy	± 0.05 pH
Resolution temperature	0.1 °C; Accuracy: ± 1 °C, selectable °C / °F system
Selectable buffer system	pH 7.00 or pH 6.86
Calibration	1, 2, or 3 points calibration with auto-recognition (NIST / IUPAC)
Temperature compensation	Automatic
Memory	Time and date display / stamp with 25 sets of data storage (non-volatile)
Display	22 x 22 mm LCD screen, with yellow/green backlight
Power supply	2 x CR2032 batteries
Battery life	> 25 hours (continuous use, backlight OFF), low battery indicator on LCD screen
Auto-off	8 minutes non-use
Conformity	CE
Part Number	19 48 00
Spare electrode	19 48 20

SD 80 TDS

Range	0 - 60 °C, < 10.00 ppt ²⁾
Resolution	1 ppm (<= 999 ppm) 0.01 ppt (1.0 - 10.00 ppt)
Resolution temperature	0.1 °C; Accuracy: ± 1 °C, selectable °C / °F system
Auto switch over ppm and ppt	ppm: 0 - 999 ppt: 1.00 - 10.00
Calibration	up to 2 points calibration manual mode ± 50 % adjustable value

Temperature compensation	Automatic
Memory	Time and date display / stamp with 25 sets of data storage (non-volatile)
Display	22 x 22 mm LCD screen, with yellow/green backlight
Power supply	2 x CR2032 batteries
Battery life	> 25 hours (continuous use, backlight OFF), low battery indicator on LCD screen
Auto-off	8 minutes non-use
Conformity	CE
Part Number	19 48 03
Spare electrode	19 48 22

SD 60 ORP

Range	0 - 60 °C, -1800 ~ 1800mV
Resolution	0.1 mV (within ± 1000 mV) 1 mV (outside ± 1000 mV)
Accuracy	± 20 mV
Resolution temperature	0.1 °C; Accuracy: ± 1 °C, selectable °C / °F system
Calibration	1 point calibration with ± 150 mV adjustable ORP value
Temperature compensation	Automatic
Memory	Time and date display / stamp with 25 sets of data storage (non-volatile)
Display	22 x 22 mm LCD screen, with yellow/green backlight
Power supply	2 x CR2032 batteries
Battery life	> 25 hours (continuous use, backlight OFF), low battery indicator on LCD screen
Auto-off	20 minutes non-use
Conformity	CE
Part Number	19 48 01
Spare electrode	19 48 21

SD 90 Salt

Range	0 - 60 °C, < 20.00 ppt ± 2.00 % ³⁾
Resolution	0.01 % (when set to "P" % unit) 1 ppm (< 2000 ppm) 0.01 ppt (2.0 - 20.00 ppt)
Resolution temperature	0.1 °C; Accuracy: ± 1 °C, selectable °C / °F system
Auto switch over ppm and ppt	ppm: 0 - 1999 ppt: 2.00 - 20.00
Calibration	up to 2 points calibration manual mode ± 50 % adjustable value

Selectable unit system	"P" % or ppt / ppm
Temperature compensation	Automatic
Memory	Time and date display / stamp with 25 sets of data storage (non-volatile)
Display	22 x 22 mm LCD screen, with yellow/green backlight
Power supply	2 x CR2032 batteries
Battery life	> 25 hours (continuous use, backlight OFF), low battery indicator on LCD screen
Auto-off	8 minutes non-use
Conformity	CE
Part Number	19 48 04
Spare electrode	19 48 22

SD 70 Con

Range	0 - 60 °C, < 20.00 mS ¹⁾
Resolution	1 µS (<= 1999 µS) 0.01 mS (2.0 - 20.00 mS)
Resolution temperature	0.1 °C; Accuracy: ± 1 °C, selectable °C / °F system
Auto switch over µS and mS	µS: 1 - 1999 mS: 2.00 - 20.00
Calibration	1 or 2 points calibration for auto mode Standard: 1413 µS or Standard: 12.88 mS up to 2 points calibration for manual mode ± 50 % adjustable value
Temperature compensation	Automatic
Memory	Time and date display / stamp with 25 sets of data storage (non-volatile)
Display	22 x 22 mm LCD screen, with yellow/green backlight
Power supply	2 x CR2032 batteries
Battery life	> 25 hours (continuous use, backlight OFF), low battery indicator on LCD screen
Auto-off	8 minutes non-use
Conformity	CE
Part Number	19 48 02
Spare electrode	19 48 22

Conversion table

- 1) 0 - 20.00 mS/cm = 0 - 20,000 µS/cm
- 2) 0 - 10.00 ppt TDS = 0 - 10,000 ppm TDS
- 3) 0 - 20.00 ppt NaCl = 0 - 20,000 ppm NaCl
0 - 20.00 ppt NaCl = 0 - 2 % NaCl
0 - 20.00 ppt NaCl = 0 - 20 g/l NaCl
ppm = Parts per Million = mg/l
ppt = Parts per Thousand = g/l



SD 300 pH & SD 320 Con (IP 67 waterproof)



Waterproof Hand-held Meters for:

- pH / Redox / Temperature
- Conductivity / TDS / Salinity / Temperature

Highlights

- Rugged, water resistant (IP 67)
- Designed for field use
- PC interface for data download (USB / serial or analog)
- Automatic buffer detection for calibration (pH 300)
- Data logger and alarm function (min./max.)
- Easy-to-read backlit LCD display
- Automatic temperature compensation
- High resolution (0.001 pH / 0.1 mV)

SD 300 pH Features

Min / Max Value Memory

highest and lowest measured value is saved

Auto Hold

freeze and display measurement

Auto Power Off

if unused, the meter automatically switches off after a selected period (0 to 120 min, or deactivated)

Additional Display for pH Electrode and Battery

Bar graph display

Low Battery Display "BAT"

Automatic Temperature Compensation

Automatic Temperature Compensation (ATC) in pH mode (in the range of 0 - 105 °C) when the temperature probe is connected. Temperature can be input manually, when the temperature probe is not attached.

pH Calibration

Automatic Buffer Recognition.

Permissible electrodes' data: Asymmetry: ± 55 mV / Slope: 45 ... 62 mV/pH

The condition of pH Electrode is checked at each calibration.

1, 2 or 3 point calibration with Lovibond® Standard Buffer, DIN 19266 Buffer or any manually entered Buffer values.

Redox Measurement (ORP)

2 options:

"mV" Standard Redox or mV measurement

"mVH" Conversion to hydrogen systems according to DIN38404 Part 6

rH Measurement

The rH value is calculated from a measured Redox value and a manually input pH value

SD 320 Con Features

Min / Max Value Memory

highest and lowest measured value is saved

Auto Hold

freeze and display measurement

Auto Power Off

if unused, the meter automatically turns off after a selected period (0 to 120 min, or deactivated)

Additional Display for pH Electrode and Battery

Bar graph display

Low Battery Display "BAT"

Automatic Temperature Compensation

As conductivity depends strongly on temperature, each conductivity value is only valid at the corresponding temperature. The device supports temperature compensation, i.e. referring the conductivity to a reference temperature (selectable: 20 °C or 25 °C)

Salinity Measurement

Salinity means the sum of amount of all dissolved salts in water. The unit is g / kg.

TDS Measurement (TDS)

TDS means the mass concentration of dissolved media in a liquid. The unit is mg/l.

SD 300 & SD 320



SD 300 Ordering Information

Ordering Information

Order Code: 72 46 00
SD 300 pH Meter
Instrument, with batteries,
protective armoring,
instruction manual

Order Code: 72 46 10
SD 300 pH (SET 1)
instrument, batteries,
pH/temp. plastic-electrode type 230,
pH-buffer-set (pH 4.00/7.00/10.00),
in case, manual

Order Code: 72 46 11
SD 300 pH (SET 2)
as SET1, but with pH / temperature
plastic-electrode type 225,
temperature sensor Pt 1000, manual

P/N	Description
72 12 31	pH/temp.-electrode type 230 plastic/gel/temperature NTC30kOhm (SET 1)
72 12 26	pH-electrode plastic/gel-type 225 (SET 2)
72 12 35BNC	pH-electrode glass/gel-type 235
72 12 40BNC	Redox-electrode plastic-type 240
72 1 245	Pt1000 Temperature sensor (SET 2)
41 86 09	KCl-solution, 3 molar saturated with AgCl, 100 ml
R-5012-4 72 12 52	pH buffer 4.00 (25°C), 500 ml pH buffer 4.00 (25°C), 1 liter
R-5013-4 72 12 54	pH buffer 7.00 (25°C), 500 ml pH buffer 7.00 (25°C), 1 liter
R-5014-4 72 12 56	pH buffer 10.00 (25°C), 500 ml pH buffer 10.00 (25°C) 1 liter
19 50 70	Redox calibration solution, 470 mV, 100 ml
72 46 20	USB 300 cable, for connection to a computer
72 46 25	GSOFT 3050 data transmission software with logger for setting, reading and printing of stored data
72 50 60	Case with foam insert

SD 300 Specifications

Measuring ranges

pH	- 2.000 ... 16.000 pH
Redox / mV	- 2000.0 ... 2000.0 mV
Temperature	- 5.0 ... + 150.0 °C + 23.0 ... + 302.0 °F
rH	0.0 ... 70.0 rH

Accuracy

pH	± 0.005 pH
Redox / mV	± 0.05 % FS (mV or mVH)
Temperature	± 0.2 °C - 5.0 ... + 100.0 °C)
rH	± 0.1 rH

Connections

pH, Redox	BNC female connector, compatible to standard BNC plugs and waterproof BNC plugs, additional banana-jack (4 mm) for separate reference electrode input resistance: 10 ¹² Ohm
Temperature	2 banana jacks (4 mm) for temperature probe (Pt1000 or NTC 10K)
Interface / Supply	4-pole bayonet connector for serial interface and supply (with accessory USB 300)
Display	two 4.5 - digit seven-segment display (15 mm and 12 mm)

pH Calibration

Automatically	1, 2 or 3 point calibration, Standard Buffer or Buffer to DIN19266
Manually	1, 2 or 3 point calibration
Protection class	IP67 (housing and connections)
Dimensions	160 x 86 x 37 mm (H x W x D) incl. protection cover
Weight	250 g incl. battery and protective armoring
Housing	impact resistant PA 6 G B30 housing with pop-up clip
Armoring	Shock-absorbing protective armoring
Power supply	2 x AAA-battery (included) power consumption: < 1.0 mA
Battery life	1000 hours

SD 320 Specifications

Measuring ranges

Number	5
Smallest Range	0.000 ... 5.000 µS / cm * or 0.0 ... 500.0 µS / cm **
Largest Range	0 ... 5000 µS / cm * or 0 ... 1000 mS / cm **
Resistivity	0.005 ... 500.0 kOhm / cm (depends on cell constant)
TDS	0 ... 5000 mg/l (depends on cell constant)
Salinity	0.0 ... 70.0 (g salt / kg water equals PSU = Practical Salinity Unit)
Supported cell constants	4.000 ... 15.000 / cm-1 0.4000 ... 1.5000 / cm-1 0.04000 ... 0.15000 / cm-1 0.004000 ... 0.015000 / cm-1

Accuracy

Conductivity	± 0.5 % of reading ± 0.1 % FS
Temperature	± 0.2 °C (- 5.0 ... + 100.0 °C)

Connections

Conductivity, Temperature	1 x 7 pole bayonet connector for connection of different measuring cells
Supported Temperature Sensors	Pt1000 or NTC 10K
Interface / Supply	4-pole bayonet connector for serial interface and supply (with accessory USB 300)
Display	two 4.5 - digit seven-segment display (15 mm and 12 mm)
Protection Class	IP67 (housing and connections)
Dimensions	160 x 86 x 37 mm (H x W x D) incl. protection cover
Weight	250 g incl. battery and protective armoring
Housing	impact resistant PA 6 G B30 housing with pop-up clip
Armoring	Shock-absorbing protective armoring
Power supply	2 x AAA-battery (included) power consumption: < 1.0 mA
Battery life	160 hours

depends on cell constant of used electrode
* cell constant 0.01 / cm
** cell constant 0.1 ... 1.2 / cm

SD 320 Ordering Information

P/N	Description
19 80 50 40	Conductivity cell LC 12, measuring range 0 - 200 mS
19 80 50 45	Conductivity cell LC 16, measuring range 0 - 1000 mS
72 22 50	Calibration solution 1413 µS/cm
72 46 20	USB 300 cable, for connection to a computer
72 46 25	GSOFT 3050 data transmission software with logger for setting, reading and printing of stored data
72 50 60	Case with foam insert

Ordering Information

Order Code: 72 47 00
SD 320 Con (Set 1)
Instrument, with batteries,
Conductivity Cell LC 12 (measuring range 0 - 200 mS), instruction manual in case

Order Code: 72 47 20
SD 320 Con (Set 2)
Instrument, with batteries,
Conductivity Cell LC 16 (measuring range 0 - 1000 mS), instruction manual in case



SensoDirect Oxi200 (IP 67 waterproof)



The SensoDirect Oxi200 is a rugged, high performance handheld meter that is specifically designed for use in both the laboratory and the field. The meters come standard with the following features:

- Waterproof housing with built-in storage compartment for probes.
- A simple user interface for easy meter operation both outdoors and in the laboratory.
- The automatic Hold function which "freezes" stable measuring data in the display and indicates the presence of reliable and reproducible results.
- The internal memory allows storage of 20 data sets to facilitate subsequent evaluation.
- The integral automatic switch-off feature, varying from 1 to 120 minutes, to preserve the battery life of the units.
- The power consumption of all three units has been optimized. As a result, the 4 x 1.5 V integrated batteries have an operating life of up to 12,000 hours, depending on the version.

Oxi 200 Features

- Oxygen partial pressure, Oxygen concentration, Oxygen saturation, Temperature measurement
- Automatic absolute air pressure measurement
- Auto Hold function
- Easy calibration against oxygen in air
- Salinity correction
- Self-polarising galvanic oxygen probe, allows instant measurement after the system is turned on
- Low battery and battery change indicator
- Sensor evaluation in the display
- Accessories for depth measurement
- Battery operation period up to 12000 hours
- Shock-absorbing rubber protective armoring
- Waterproof

Waterproof Hand-held Meters for:

- Dissolved Oxygen (O₂)
- O₂ Concentration in mg/l
- O₂ Saturation in %
- °C / °F

Specifications

O₂ partial pressure	0.0...570.0 hPa, 0...1200 hPa 0.0...427.5 mm Hg, 0...900 mm Hg
O₂ concentration	0.00...25.00 mg/L, 0.0...70.0 mg/L
O₂ saturation	0.0...250.0 %, 0...600 %
Accuracy	± 1.5% ± 0.2 mg/L (0...25 mg/L) ± 2.5% ± 0.3 mg/L (25...70 mg/L) ±1Digit
Temperature	-5.0 ... + 50.0 °C 23.0 ... 122.0 °F
Accuracy	± 0.1 °C
Abs. air pressure	500..1100 hPa
Accuracy	± 0.5% full scale
Nominal temperature	25 °C
Operating temperature	0 to +50 °C
Storage temperature	-20 to +70 °C
Power supply	4 x 1.5 V battery, Type AA Operating time up to 12.000 h
Power consumption	max. 0.25 mA
Auto-Off function	0 - 120 minutes
Dimensions	6.9" x 5.5" x 1.8" (L x W x H)
Weight	approx. 1.28 lbs.
Electrode	Self-polarizing oxygen electrode with integrated NTC sensor Connection: 7-pin DIN socket Installation diameter: 12.0 ± 0.2 mm Overall length: approx. 220 mm (incl. kink protection) Operating temperature: 0...40 °C
Conformity	CE

Ordering Information

P/N	Item
72 32 01	Oxygen sensor, 1.5 m cable
72 32 10	Oxygen sensor, 10 m cable
72 32 30	Oxygen sensor, 30 m cable
72 32 50	Service Set Oxygen sensor 3 interchangeable membrane heads, 100 ml plastic bottle KOH-solution 3 mol/l
72 32 60	Protection cap for depth measurement
72 50 20	Case with foam insert

Delivery Content

Order Code: 72 32 20
Series 200 DO Meter, Set 1
with batteries,
oxygen sensor (1.5 m cable),
electrolyte (KOH), 3 interchangeable
membrane heads, in case, manual,
guarantee sheet

Order Code: 72 32 21
Series 200 DO Meter, Set 2
as above, but with
oxygen sensor 10 m cable

Order Code: 72 32 22
Series 200 DO Meter, Set 3
as above, but with
oxygen sensor 30 m cable



SensoDirect 150 Meter (IP 67 waterproof)



Highlights

- pH/Redox
Conductivity
Dissolved Oxygen
- Multi-Parameter
- Real time data logger
- Large digital display
- Protective casing
- RS 232 / USB

The SensoDirect 150 combines the features of several hand-held meters. It is designed for multi-use operation and measures pH/Redox, dissolved oxygen and conductivity/TDS.

The SensoDirect 150 incorporates an intuitive user interface, large, easy to read display and is supplied with a sturdy handy case with electrodes, buffer solution and accessories.

Ordering Information

P/N	Item
72 13 30	Spare electrode, (approx. 1 m cable), plastic/gel type BNC-plug
R-5012-4	pH buffer 4.00 (25°C), 500 ml
72 12 52	pH buffer 4.00 (25°C), 1 liter
R-5013-4	pH buffer 7.00 (25°C), 500 ml
72 12 54	pH buffer 7.00 (25°C), 1 liter
R-5014-4	pH buffer 10.00 (25°C), 500 ml
72 12 56	pH buffer 10.00 (25°C) 1 liter
72 12 42	Redox electrode, (approx. 1 m cable), plastic/gel type BNC-plug
19 50 70	Redox calibration solution, 470 mV, 100 ml
72 44 00	Conductivity probe (Con / TDS), (approx. 1.2 m cable)
72 22 50	Calibration solution 1413 µS/cm
72 44 10	Oxygen sensor, (approx. 4 m cable)
72 44 60	Spare membrane for oxygen sensor
72 44 70	Spare electrolyte for oxygen sensor
72 44 20	Temperature probe PT1000 (approx. 1.5 m cable)
72 45 00	RS232 cable for connection to a computer
72 45 10	USB cable for connection to a computer
72 45 40	Power supply (EU Connection)
72 50 50	Case with foam insert
72 45 20	Data Retrieve Software Software which enables the user to transmit data stored on the instrument to a computer
72 45 30	Data Logger / Acquisition Software Software which enables the user to monitor and log data on a computer (online measurement)

Specifications

Display	Large LCD display with contrast adjustment
Measurement	pH: 0 to 14.00 pH ORP: ± 1999 mV Conductivity: 200 µS / 2 mS / 20 mS / 200 mS TDS (Total Dissolved Solids): Dissolved Oxygen: 0 to 20.0 mg/l
Data Logger	Real time data logger
Data Memory	Auto or manual data memory, 16000 data sets
Data Hold	Max, Min
Interface	USB, RS232
Probes	pH, ORP, Conductivity/TDS, Dissolved Oxygen and Temperature
Power off	Auto shut off or manual off
Data Output	RS 232 PC serial interface
Power Supply	DC 1,5 V battery (UM3, AA) x 4 PCs or DC 9V adapter in
Dimensions	220 x 120 x 40 mm (L x W x H)
Weight	approx. 625 g (unit incl. batteries)
Software	Data acquisition software Data logger software

CE-Conformity

pH/Redox

Range	pH 0 to 14 PH mV -1999 mV to 1999 mV
Resolution	0 - 14 pH, 0.01 pH 0 - 1999 mV, 1 mV
Accuracy	0 - 14 pH, ± 0.02 pH + 2 digits 0 - 1999 mV, ± 0.5 % + 2 digits
Temperature Compensation	manual 0 - 100 °C automatic (ATC)
pH Calibration	pH 7, pH 4, and pH10, 3 points calibration

Dissolved Oxygen

Range	Dissolved Oxygen 0 to 20.0 mg/l (liter) Oxygen in Air 0 to 100.0 % Temperature 0 to 50 °C
Resolution	Dissolved Oxygen 0.1 mg/l 0.1 % O ₂ Temperature 0.1 °C
Accuracy (23± 5 °C)	Dissolved Oxygen ± 0.4 mg/l Oxygen in Air ± 0.7% O ₂ Temperature ± 0.8 °C / 1.5 °F
Salinity Correction	0 to 39 % Salt
Air Pressure Compensation	0 to 8900 meter

Conductivity/TDS

Range/Resolution	Conductivity (µS, mS) 0 - 200.0 µS / 0.1 µS 0.2 - 2.000 mS / 0.001 mS 2 - 20.00 mS / 0.01 mS 20 - 200.00 mS / 0.1 mS TDS (Total Dissolved Solids) 0 - 132 ppm / 0.1 ppm 132 - 1,320 ppm / 1 ppm 1,320 - 13,200 ppm / 10 ppm 13,200 - 132,000 ppm / 100 ppm
Temperature	0 - 60 °C / 0.1 °C 32 - 140 °F / 0.1 °F
Accuracy	± 2 % F.S. + 1 digit ± 0.8 °C / ± 1.5 °F
Function	Conductivity (µS, mS) TDS (Total Dissolved Solids, PPM) Temperature (°C, °F)

Delivery Content

Order Code: 72 42 00
SensoDirect 150 Set pH/Con/TDS/Oxi instrument, batteries, pH electrode, temperature probe, conductivity probe, oxygen sensor, pH buffer set 4.00 / 7.00, electrolyte, membrane heads, instruction manual, and carrying case.

Order Code: 72 42 10
SensoDirect 150 Set pH / Con / TDS instrument, batteries, pH electrode, temperature probe, conductivity probe, pH buffer set 4,00 / 7,00, instruction manual, guarantee sheet, in case

Order Code: 72 42 20
SensoDirect 150 Set pH / Oxi instrument, batteries, pH electrode, temperature probe, oxygen sensor, pH buffer set 4,00 / 7,00, electrolyte, membrane heads, instruction manual, guarantee sheet, in case

Order Code: 72 42 30
SensoDirect 150 Set pH / Redox instrument, batteries, pH electrode, temperature probe, redox electrode, pH buffer set 4,00 / 7,00, instruction manual, guarantee sheet, in case

TURBIDITY



TB 250



TB 300 IR

TB 250 Portable Turbidimeter

The Lovibond® TB 250 Portable Turbidimeter allows fast and easy turbidity measurement in both the field and in the laboratory.

Using a "white light" source and 90° detection, the TB 250 meets the USEPA specifications for turbidity measurement (EPA Standard 180.1). Also available in an Infrared version, the TB 250 IR is ISO 7027 compliant.

The instrument features an auto-ranging function that automatically selects the correct turbidity range for your sample. Calibration is simple with the included calibration standards.

A power efficient microcircuit design allows the instrument to yield 5,000 tests on 4-AA alkaline batteries with an estimated 7 to 10 year bulb life. Integrated diagnostics confirm proper operation and accuracy.



Ordering Information

Item	P/N
TB 250 Portable Turbidimeter	19 42 00
TB 250 IR Portable Turbidimeter	19 42 10
TB 250 & TB 250 IR Calibration Set 0.02, 10, 1000 NTU	19 42 80
Sample Cells 3 pack, with lids	19 42 90
Formazin Stock Solution, 100 ml 4000 NTU	19 41 41
Formazin Stock Solution, 250 ml 4000 NTU	19 41 42

Specifications

Display	large LCD display
Keypad	5 key polycarbonate membrane, splash proof
Power supply	4 AA Alkaline batteries for approx. 20 h continuous operation or 3500 tests
Range	0.01 to 1100 NTU
Accuracy	± 2% of value or 0.01 NTU (0-500 NTU) ± 3% of value (500-1100 NTU)
Resolution	< 100 NTU 0.01 NTU 100-999.9 NTU 0.1 NTU 1000-1100 NTU 1 NTU
Housing	ABS
Dimensions	210 x 95 x 45 mm
Weight	approx. 0.45 kg (base unit)
Ambient conditions	Temperature: 0 – 50 °C rel. humidity: 0 – 90%
Conformity	CE



Highlights

- Available in "White Light" and Infrared versions
- Regulatory Compliant
 - TB 250: EPA 180.1
 - TB 250 IR: ISO 7027
- Auto ranging
- High accuracy
- Laboratory and Field use
- Long battery and bulb life
- Easy calibration
- Simple 5 key operation



TB 300 IR Laboratory Turbidimeter

The TB 300 IR Laboratory Turbidimeter is designed for quick and easy turbidity measurement in the laboratory.

Using an infrared (IR) light source and 90° detection, the TB 300 IR conforms with ISO 7027 specifications for turbidity measurement of colored and color-free samples.

The auto-ranging function automatically selects the correct range for turbidity measurement from 0.01 to 1100 NTU. The data-logging feature enables the user to store up to 1,000 data sets with the date, time, and registration number.

Ordering Information

Item	P/N
TB 300 IR Lab Turbidimeter Includes instrument, 4 sample cells, Calibration Set and PC Connection cable in a carrying case.	19 40 00
Set of 12 sample vials with lid, height 55 mm, ø 24 mm	19 76 55
Cleaning cloth for vials	19 76 35
Rubber seal cap, black for interface and power plug-in	19 80 17 16
Sample chamber lid, black	19 80 11 19
Mains charger 100-240 V, 50-60 Hz, with international adapters	19 30 10

Highlights

- Meets EN ISO 7027
- Automatic overall range adjustment with Standard set
- Autoranging
- Laboratory and field use
- RS 232 interface
- Storage for up to 1000 data sets
- Real-time clock
- Waterproof sample chamber and housing



Specifications

Item	P/N
Universal adapter for socket international	19 20 65
Cable connection to PC serial 9-pins	19 81 98
Lithium battery	19 50 017
Formazin Stock Solution, 100 ml 4000 NTU	19 41 41
Formazin Stock Solution, 250 ml 4000 NTU	19 41 42
Set Calibration Standards (<0.1, 20, 200, 800 NTU)	19 41 50

Principle	nephelometric (90° scattered light)
Light source	IR-LED (860 nm)
Keypad	acid and solvent resistant; membrane keypad
Auto – Off	20 minutes after last key press
Display	Graphic-Display
Update	Software update via Internet
Clock	real time clock
Memory	1000 data sets
Sample vol.	approx. 12 ml
Range	0.01 – 1100 NTU (Auto range)
Resolution (NTU)	0.01 from 0.01 - 9.99 0.1 NTU from 10.0 - 99.9 1 NTU from 100 - 1100
Accuracy (NTU)	± 2 % of reading or 0.01 (0 - 500) ± 5 % of reading (500 - 1100)
Ambient conditions	temperature: 5-40°C at 30-90% relative humidity (non-condensing)
Interface	RS232 for printer and PC- connection
Power supply	7 NiCd rechargeable batteries (Type AA) ; mains adapter (Input: 100-230V ; and lithium battery for data storage
Weight (instrument)	approx. 1000 g including batteries and power pack
Dimensions	265 x 195 x 70 mm (L x W x H)
Conformity	CE

Floc Testers



Floc testers with continuously variable stirring speed for laboratory and field use

Highlights

- Continuously variable stirring speed
- Digital display
- Height adjustment of the stirring blades during operation
- Timer feature

ET 740 (laboratory)

Stirring places	4
Stirring speed control	10 - 300 revolutions per minute
Resolution	1 revolution
Timer	1 - 999 minutes or 0 - 99 hours (continuous)
Power supply	100 - 240 V, 50 - 60 Hz
Weight	approx. 28.7 lbs.
Dimensions (LxWxH)	25.4" x 13.7" x 10.24"
EC-conformity	CE
Part Number	2 41 91 55

ET 750 (laboratory)

Stirring places	6
Stirring speed control	10 - 300 revolutions per minute
Resolution	1 revolution
Timer	1 - 999 minutes or 0 - 99 hours (continuous)
Power supply	100 - 240 V, 50 - 60 Hz
Weight	approx. 37.5 lbs.
Dimensions (LxWxH)	36.8" x 13.7" x 10.24"
EC-conformity	CE
Part Number	2 41 91 60

ET 730 (portable/field)

Stirring places	4
Stirring speed control	20 - 40 - 50 - 100 - 120 revolutions per minute
Timer	1 - 30 minutes (continuous)
Power supply	100 - 240 V, 50 - 60 Hz
Weight	approx. 10.6 lbs.
Dimensions (LxWxH)	9.85" x 12.6" x 9.85"
EC-conformity	CE
Pat Number	2 41 91 50

Accessories

Soft Carrying Bag for ET 730	41 91 51
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Floc testers are designed for a range of applications – such as testing the efficiency of flocculation or precipitation agents.

The ET 740 model with 4 stirring places and the ET 750 model with 6 stirring places are fitted with an illuminated back panel for glare-free observation of the samples and are suitable for laboratory use.

The floc tester ET 730 with 4 stirring places is primarily designed for field use. The 4 stirring points are arranged in a circle around a lamp making it easier to observe the flocculation process.

State-of-the-art technology ensures maximum operating convenience and makes the unit maintenance-free. The main features of the laboratory floc testers are the continuously variable stirring speed, the digital display of stirring rpm, the timer function, the illuminated back panel, and the height adjustment option for the stirring blades during operation.

For model ET 730 beakers with 1000 ml volume, low form can be used.

For models ET 740 and ET 750 beakers with 1000 ml - 1500 ml volume, low or high form can be used.

The beakers are **not** included. Please contact your local laboratory distributor.



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