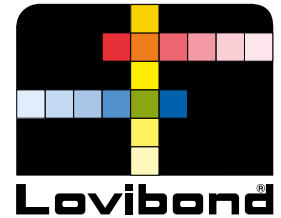


Lovibond® Water Testing

Tintometer® Group



since 1885

General Catalogue



General Catalogue

Lovibond

Instruments and Reagents
for Today's Water Analysis

www.lovibond.com

08/19

new!



Drop Test Titration Kits
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Primary Standard Chlorine
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UV/VIS Spectrophotometer
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Degradability Tests acc. to
OECD 301 F, 301 C, 302 C
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Silica Test for
Trace Range 5-500 µg/l
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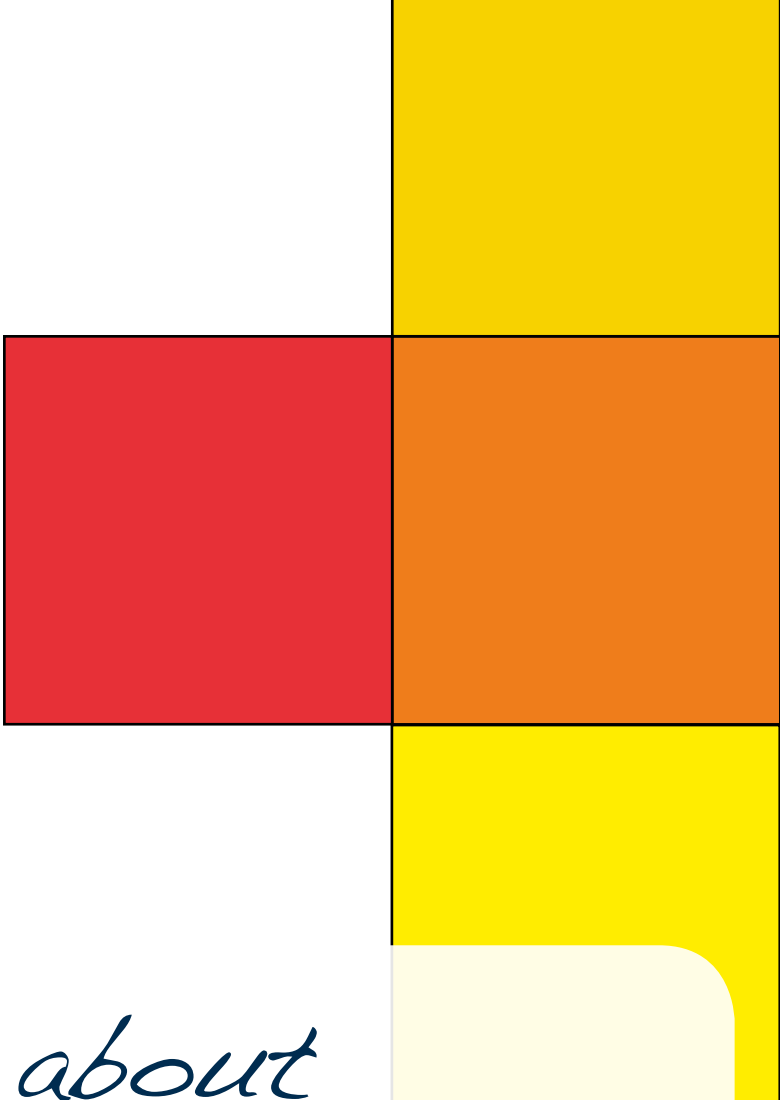
Legionella Rapid Test Kits
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Mobile Incubator
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What we care about

Every drop counts.

In the swimming pool; the sewage plant; an industrial process; or a well in an African village: for over 130 years, our Lovibond® products have been utilized where the quality of water forms the basis of existence.

With Lovibond®, you can protect your industrial plants and ensure clean, waste water. Healthy drinking water flows into your drinking bottle and you dive into clear water in your pool.

Your needs are our inspiration.

There is more to the Lovibond® logo than just instruments, chemicals and accessories for water and colour analysis. At our locations in Germany, Great Britain, in the USA and India, in Brasil, China, Spain and Malaysia, every staff member invests their passion for water and colour analysis in every instrument, every box of reagents, every pack of powder reagents, every liquid and glass standard.

Your trust is our incentive.

We are where you are.

You can obtain Lovibond® products in over 160 countries. Our analysis systems and our expertise are in demand wherever there is a need for precise and efficient analytics for challenging applications: from disinfection control; to food and beverage; or the marine industry, they are essential.

We therefore know your requirements for modern and precise water tests, your operation methods and needs for your analysis and control routines. Our instruments and reagents are constantly being further developed for you, so that you can achieve reliable results with tailor-made solutions.

With us, you get everything from one source – from the instrument to the reagents to our support.

Customer proximity and flexibility symbolise us.

Lovibond® is a family owned company which guarantees quality, control, effectiveness and reliability. We are also able to meet the constantly increasing demands because we have developed a distinctive profile with great commitment and passion. Our company is one of the the market leaders in water analysis and is therefore constantly on the move. The Lovibond® team is breaking new ground, for example in environmentally- friendly and safe chemicals or the use of state-of-the-art technologies. This is only possible because we are independent as a group of companies – and we will remain so.

Because our independence makes us unique.

Our heart also beats for colour: Colour measurement was the foundation stone and is another pillar of our company. Dive in to the Lovibond® world of water and colour at www.lovibond.com. Here you will find everything about our history, our products, our motivation. Because:

Water and colour are our life – and our vision!



Maja C. Voss, CEO

Cay-Peter Voss, CEO

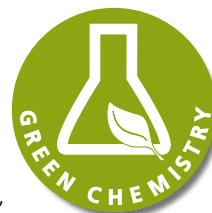
„There are very few companies which can look back over a history of more than 130 years of success. The reason we can do so lies in the world-wide appreciation of our products and the determination of our work-force to maintain this“.

Cay-Peter Voss, CEO

Green Chemistry

Breaking new ground is worthwhile!

This shows in our decision to refrain from using health-threatening substances in our chemicals and reagents wherever possible. Harmful boric acid and Ortho-Tolidine are a thing of the past for us. At the same time, our Green Chemistry label guarantees proven quality, sustainability and safety for your analysis results.



Environmental protection

Not only water is an important natural resource for us. We are also committed to protecting our environment and print this catalogue on FSC® certified paper. We are supporting the Forest Stewardship Council® (FSC®) in their worldwide work with environmental associations, social organisations, advanced forest enterprises and wood processing companies for an improvement of forest management. Only products whose raw material comes from carefully managed forests bear the seal of quality.



We produce for you...

... everything from a single source. With us, you get more than just the right instruments for your requirements and applications. You test drinking and waste water, surface water, ground and raw water, wastewater, cooling and boiler water or pool water every day: we supply you with the instruments, the suitable reagents and also the accessories to do this.

... controlled and safe. We check all our instruments, reagents and accessories in the production according to strict specifications. Our quality management guarantees additional safety pursuant to DIN EN ISO 9001 and has been certified for over 22 years.

... custom-fit and flexible. Our experts find solutions for your individual requirements and needs. You carry out routine analysis both in laboratory and in the field, you control the water in the public or private pool every day: With us you get the suitable instrument and everything you need for a fast and reliable water analysis.

... on a higher level, in each of our departments, our experts and staff members work constantly to further develop our products. The proven high quality standard of our instruments, reagents and chemicals has the highest priority when we break new grounds in instrument development with decades of experience. Our popular photometers, test kits and electrochemical instruments are always state of the art with the latest **Bluetooth®** technology and modern interfaces for data transmission. With our process turbidimeters or spectrophotometers, we targeted ourselves to develop solutions for potential problems in the control routine and new, user-friendly method applications.

... service-oriented - because proximity to the customer is particularly important to us. We employ approximately 400 people to work closely together in all areas: from customer care; field service; sales; service and support to product management; product development and research, so that we can selectively develop exactly what you need. From software to calibration and repair to a new handbook of methods with detailed and easy-to-understand descriptions of all Lovibond® methods for photometry everything is included.

... informative. On our website, lovibond.com, you will find all the important information on every product, from anywhere, at any time – even when you are on the go via your smartphone or tablet. Here you can find details on all the new products and numerous downloads, for example our safety data sheets and certificates of analysis. In the Download Centre you can also access operating instructions, data sheets and catalogues. These are currently available in German, English, French, Spanish and Chinese, – our range of languages, however, is constantly being expanded.

Sign up now!

Dealer Portal on our Lovibond® Homepage

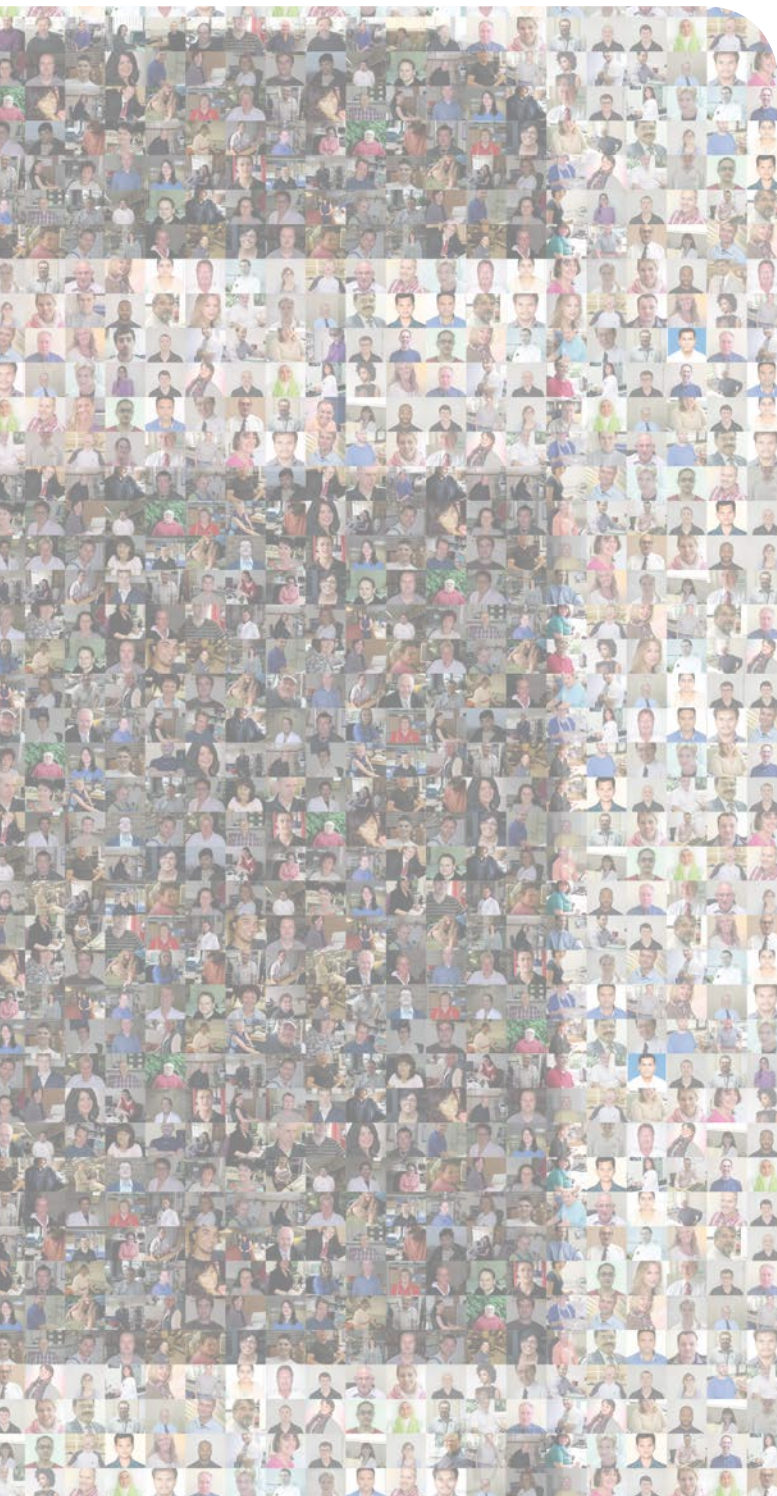
Are you a dealer
and not registered yet?

Then sign up now! Because in the
Dealer Portal of our homepage you
will have access to many valuable

working aids and supplementary tools.

Simply register with your customer ID.

After a short check, your login data will be activa-
ted and you can download the current price lists
at any time. We also have dealer packages, pro-
duct pictures, presentations and posters ready for
you here.





Rapid Tests

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- 12 Test Kits
- 13 Arsenic Test Kit /
Three-Chamber-Tester Chlorine
- 14 Drop Test Titration



Comparators

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Photometry

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Reagents

86 Indicator Systems

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Turbidity

122 TB 300 IR

124 TB 211 IR

125 TB 250 WL



Flocculation

126 Floctester ET 740,
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BOD

128 BSB System BD 600

130 BSB System BD 600 GLP



Temperature Control

132 Thermostatically Controlled
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134 Spark-free Cabinets



Electrochemistry

138 SD 400 Oxi L

140 SD 300 pH, SD 310 Oxi
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144 SensoDirect 150

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148 SD Series Hand held meters

150 Accessories SD Series



Microbiology

156 Dipslides / DI 10 Incubator

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162 Test Kits

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Pool Analytics

168 Rapid Tests

170 Scuba II

172 Photometer PM 600,
PM 620 & PM 630

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The background image shows a complex industrial facility, likely a refinery or chemical plant. It features a dense network of large, metallic pipes, some of which are insulated with white material. The scene is illuminated with a strong blue light, creating a cool, industrial atmosphere. The pipes are arranged in various directions, some running horizontally and others vertically, with several large elbows and flanges visible. In the foreground, a large, horizontal pipe is partially visible, and its reflection is seen in a pool of liquid on the ground. The overall composition is industrial and technical.

Rapid Tests



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MINIKIT



Easy handling through complete test set

Tablet reagents long-term stable & easy to dose

Unrestricted shipment

High accuracy

Analysis	Type	Range	Methods Tablet Count	Speed Test	Yes/ No Test
Alkalinity-m	AF 444	20 - 800 mg/l $\text{CaCO}_3 \approx 0.4 - 16 \text{ mmol/l}$		■	
Alkalinity-m	AF 413	10 - 500 mg/l $\text{CaCO}_3 \approx 0.2 - 10 \text{ mmol/l}$	■		
Alkalinity-p	AF 414	20 - 500 mg/l CaCO_3	■		
Calcium Hardness	AF 446	20- 800 mg/l $\text{CaCO}_3 \approx 0.4 - 16 \text{ mmol/l}$		■	
Calcium Hardness	AF 416	10- 500 mg/l $\text{CaCO}_3 \approx 0.1 - 5 \text{ mmol/l}$	■		
Chloride	AF 418	5 - 5000 mg/l Cl	■		
Cyanuric Acid	AF 422	20 - 200 mg/l Cyanuric Acid			
Hardness Total (very low range)	AF 426	1 - 10 mg/l $\text{CaCO}_3 \approx 0.01 - 0.1 \text{ mmol/l}$	■		
Hardness Total (low range)	AF 425	1 - 50 mg/l $\text{CaCO}_3 \approx 0.01 - 0.5 \text{ mmol/l}$	■		
Hardness Total (Yes/No)	AF 423	Limit 4 mg/l, 8 mg/l or 20 mg/l CaCO_3			■
Hardness Total	AF 445	20 - 800 mg/l $\text{CaCO}_3 \approx 0.4 - 16 \text{ mmol/l}$		■	
Hardness Total	AF 424	5 - 500 mg/l $\text{CaCO}_3 \approx 0.05 - 5 \text{ mmol/l}$	■		
Alkalinity Caustic/P	AF 415	20 - 500 mg/l CaCO_3	■		
Nitrite	AF 427	70 -1500 mg/l NaNO_2			
Organo- Phosphonate	AF 411	1 - 20 mg/l active O-P	Drop count method		
QAC (Quaternary Ammonium Comp.)	AF 417	0 - 500 mg/l active QAC Limit 200 mg/l (Yes/No)	■		■
Säurekonzentration	AF 410	0.75-10% Acid	■		
Sulphate (low range)	AF 432	20 - 200 mg/l Na_2SO_4	■		
Sulphate	AF 431	40 - 200 mg/l SO_4 (40 - 4000 mg/l by dilution)			
Sulphite (low range)	AF 434	2 - 50 mg/l Na_2SO_3	■		
Sulfit (high range)	AF 435	2 - 20 units	■		
Tannin Index	AF 436	2 - 20 units	■		



The methods

The MINIKITS are designed for tablet based rapid water testing. Most MINIKITS are based on titrimetric methods.

Tablet count method

In the tablet count method, the liquid titration solution and indicator are replaced by Lovibond® tablet reagents. A specific number of tablets is added to a defined sample volume until a chemically induced colour 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 colour 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.

Turbidity	Order code	Reagent	Order code	Quantity
	41 44 40	ALK-TEST	51 55 70 BT	100
	41 41 30	TOTAL ALKALINITY-tablets	51 53 21 BT	250
	41 41 40	Alkalinity-p-tablets	51 51 01	250
	41 44 60	CAL-TEST	51 55 80 BT	100
	41 41 60	CALCIUM HARDNESS	51 51 91 BT	250
	41 41 80	CHLORIDE	51 51 31	250
■	41 42 20	CyA-TEST	51 13 70 BT	100
	41 42 60	HARDNESS VLR	51 53 51 BT	250
	41 42 50	HARDNESS LR (BW)*	51 51 71 BT	250
	41 42 30	HARDNESS YES / NO	51 53 61 BT	250
	41 44 50	T HARDNESS-TEST	51 55 90 BT	100
	41 42 40	TOTAL HARDNESS	51 51 61 BT	250
	41 41 50	Alkalinity-p-tablets	51 51 01 BT	250
		Alkalinity-p (BaCl ₂)-tablets	51 51 10 BT	100
	41 42 70	NITRITE No. 1	51 52 00 BT	100
		NITRITE No. 2	51 52 10 BT	100
	41 41 10	ORGANO-PHOSPHONATE No. 2	46 53 51	100 ml
		ORGANO-PHOSPHONATE No. 1	51 29 61 BT	250
	41 41 70	QAC-Test	51 54 10	100
			51 54 11	250
	41 41 00	ACID CONCENTRATION	50 54 20	100
	41 43 20	SULFATE No. 1	51 52 21	250
		SULFATE No. 2	51 52 31	250
■	41 43 10	SULFATE	51 54 51 BT	250
	41 43 40	SULFITE No. 1	51 52 71 BT	250
	41 43 50	SULFITE No. 2 HR	51 52 81 BT	250
		SULFITE No. 2 LR (BW*)	51 53 31 BT	250
	41 43 60	TANNIN No. 1	50 35 00	100
		TANNIN No. 2	50 35 11	250

Delivery content

- Kit in a plastic box
- Tablet reagents for an average of 30 tests
- Sample container
- Required accessories
- Instruction manual

also suitable for seawater
Green Chemistry (for detailed information see page 86)

MSDS (Material Safety Data Sheets): www.lovibond.com



*Suitable for field
& laboratory
testing*

*For testing cooling
& industrial
process water*



*Fast quantitative
determination*

*Cost-effective
use due to com-
petitively priced
refill packs*

Test Kits

Cooling and Industrial Process Water

Lovibond® test kits are specially developed for testing cooling and industrial process water. They make use of both colorimetric and titrimetric techniques. Each test kit contains all the necessary chemicals and reagents in liquid or powder form to conduct the tests.

The detailed instructions contain a step-by-step explanation of the test procedure. The kits are supplied in a sturdy, compact plastic case. Competitively priced refill reagent packs are available for all Lovibond® test kits.

Analysis	Range mg/l	Method	No. of Tests (approx.)	Order Code
Alkalinity PM-1 (p- + m-value)	1 drop = 1 or 0.5 mmol/l ¹⁾	titrimetric	75	2418501
Chloride LR CD-1	1 drop = 5 or 2,5 mg/l Cl ⁻¹⁾	titrimetric	100	2418504
Chloride HR CD-2	1 drop = 50 or 25 mg/l Cl ⁻¹⁾	titrimetric	100	2418506
DEHA	0,05 – 1 mg/l DEHA	colorimetric	50	24157580
Iron FE-2	0,1 – 2 mg/l Fe, 0,5 – 8 mg/l Fe	colorimetric	250	2418440
Hardness Carbonate (new version)	1 drop = 1 or 0,5 °dH* ¹⁾	titrimetric	25	2418413
Hardness Carbonate KH-1	1 drop = 1 or 0,5 °dH* ¹⁾	titrimetric	50	2418513
Hardness Residual RH-1	1 drop = 0,1 or 0,05 °dH* ¹⁾	titrimetric	50	2418514
Hardness Total (new version)	1 drop = 1 or 0,5 °dH* ¹⁾	titrimetric	25	2418411
Hardness Total GH-1	1 drop = 1 or 0,5 °dH* ¹⁾	titrimetric	50	2418511
Hardness Total (new version) + Carbonate GKH-1	1 drop = 1 or 0,5 °dH* ¹⁾	titrimetric	25	2418412
Carbonic Acid CO-2	1 drop = 5 or 2,5 mg/l CO ₂ ¹⁾	titrimetric	70	2418518
Phosphate (Total) PO-2 (ortho, poly, organic)	2,5 – 25 mg/l PO ₄ ³⁻	colorimetric	90	2418523
Phosphate (ortho) PO-3	2,5 – 25 mg/l PO ₄ ³⁻	colorimetric	70	2418544
Sulphite SUL-1	1 drop = 5 or 2,5 mg/l Na ₂ SO ₃ ¹⁾	titrimetric	80	2418532

* 1.0°dH = 0.18 mmol/l ; 5.6° dH = 1.0 mmol/l ¹⁾ depending on sample volume

Hardness Test Kits

Water hardness can be problematic in various applications. Be it in the household, coffee or tea preparation or in technical applications.

Lovibond® always offers the right solution for rapid and cost-effective testing of total hardness, residual hardness or carbonate hardness.



Test Kit (Silt Density Index, SDI)

- SDI calculations in just 15 minutes
- Ideally suited for reverse osmosis plants
- Enables calculation of membrane fouling time, backwash frequency and membrane lifespan

The Silt Density Index (SDI) is a measure of the solids or particulate content of water and is of specific importance when commissioning reverse osmosis plant. The SDI of the feedwater is required to calculate membrane fouling time, backwash frequency and, ultimately, membrane lifespan. The Lovibond® test kit gives the RO engineer instant SDI values, increasing the speed and effectiveness of the installation.

The kit utilises a membrane/flow meter system to enable SDI calculations in just 15 minutes. Sufficient membranes included for 100 tests.

Article	Tests/Pack	Code
Silt Density Index (SDI) Test Kit	-	56K001901
0.45 µm Pore Filter Circles 47 mm diameter	100	56A007690
On/Off Valve	-	56A007201
Pressure Regulator	-	56A007301
Pressure Gauge	-	56A007401
High Pressure Hose 1 m	-	56A007501
Filter Holder 47 mm	-	56A007701

Non-Oxidising Biocide Kits

Article	Range mg/l	Tests (aprox.)	Code
Bronopol-Kit (2-Bromo-2-nitropropan-1,3-diol)	0 - 50 mg/l	50	56K001101
Bronopol-Reagent Pack	-	50	56R001150
DBNPA-Kit (2,2-Dibromo-3-nitrilopropionamid)	5 - 20 mg/l	50	56K001201
DBNPA-Reagent Pack	-	50	56R001250
Isothiazoline-Kit	0 - 7,5 mg/l	50	56K001401
Isothiazoline Reagent Pack	-	50	56R001450

Arsenic Test Kit (5ppb)

The arsenic test is due to its high sensitivity suitable for the determination of arsenic in drinking water.

The advantages at one view

- Sensitivity is according to the requirements of the WHO for drinking water quality. This test detects 0.005 mg/l Arsenic.
- The removal of the interfering sulfide ions is integrated in the test procedure. To minimize the potential danger for the user of the test kit it doesn't use the highly toxic lead acetate for the sulfide removal.
- A solid acid substance is used in order to avoid any irritation by a corrosive acid on the user's hands.

- The unbreakable plastic reaction vessel is more convenient and safe for on-site testing.
- During the test procedure the reaction vessel is tightly closed. The developing arsine gas cannot escape and therefore does not harm the user.
- The test kit contains a water-proof colour chart which also includes the brief instruction for use in pictograms. Even if there is a lack of knowledge in foreign languages everybody can now handle the test kit.

Three-Chamber-Tester Chlorine / pH

If a fast and particularly cost-effective determination of chlorine or pH value is required, consider our three-chamber chlorine / pH tester. It comes with a pictogram-based manual and is supplied with the associated reagent tablets.

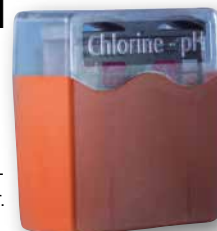
So even untrained laymen can use immediately.

0.1 - 3.0 mg/l Chlorine, pH value 6.8 - 8.2

Three-Chamber-Tester Chlorine/pH

151610

Green Chemistry



Resolution:
0 - 0,005 - 0,01 - 0,025 - 0,05 - 0,1 - 0,25 - 0,5 mg As^{3+/5+}/l

Kit for 100 measurements in case.
Order code: 40 07 00



Arsenic Test Kit, ready to use



Drop Test Titration

Derived from laboratory burette methods, the Lovibond® drop test range is an established methodology used across industry and which forms an integral part of the analytical program of many a speciality chemical supplier. The reagents are quick to use and give results fast, making the drop test the method of choice for many customers.

A number of the methods have been recently adapted to comply with changes in legislation and hazard awareness. As the Lovibond® solutions have been adapted to address these changes, they have also improved in accuracy with their hazard implications reduced. The procedure has also been simplified as part of the Lovibond® commitment to product development.

Ordering information for the drop test range is as follows:

Test Kit – Ordered using the test kit code in the table below. The kit is supplied with all reagents and equipment to perform the test, housed in a plastic case.

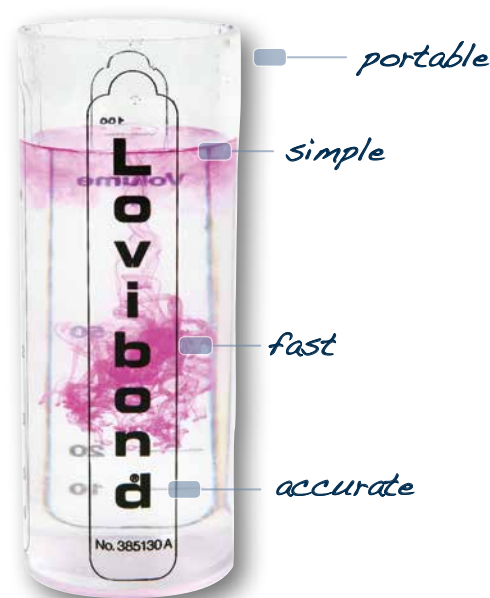
Or

Reagent Pack – Ordered using the reagent pack code in the table below. The pack is supplied in a carton containing test reagents and instruction sheet only.

Or combine reagent packs with a standard case to create your own multi-parameter test kit:

56A001801: A 1501 Compact Plus Case

Supplied with standard equipment and space to add up to 8 reagent packs – simply choose reagent packs from the list below to complete the kit.



Test Kit Code	Reagent Pack	Description	Range	Tests/Pack
56K003501	56R003590	Acidity (P) Drop Test	0-7.5% H ₂ SO ₄	100+
56K003601	56R003690	Alkalinity (M) HR Drop Test	200-2400mg/l CaCO ₃	100+
56K003701	56R003790	Alkalinity (M) LR Drop Test	50-600mg/l CaCO ₃	100+
56K003801	56R003890	Alkalinity (P + M) LR Drop Test	50-600mg/l CaCO ₃	100+
56K003901	56R003990	Alkalinity (P + OH) HR Drop Test	200-2400mg/l CaCO ₃	100+
56K004001	56R004090	Alkalinity (P) HR Drop Test	200-2400mg/l CaCO ₃	100+
56K004101	56R004190	Alkalinity (P) HR Drop Test	0.25-6.0% NaOH	100+
56K004201	56R004290	Alkalinity (P) LR Drop Test	50-600mg/l CaCO ₃	100+
56K004301	56R004390	Alkalinity (P) LR Drop Test	250-6000mg/l NaOH	100+
56K004401	56R004490	Alkalinity (P, M + OH) HR Drop Test	200-2400mg/l CaCO ₃	100+
56K004501	56R004594	Alkalinity (P, M + OH) LR + HR Drop Test	50-2400mg/l CaCO ₃	200+
56K004601	56R004690	Alkalinity (P, M + OH) LR Drop Test	50-600mg/l CaCO ₃	100+
56K004701	--	Alkalinity Total (Disposable)	9-540mg/l CaCO ₃	50+
56K025401	56R025490	Carbon Dioxide Drop Test	10-300mg/l CO ₂	100+
56K004801	56R004890	Chloride HR Drop Test	200-12,000mg/l Cl ⁻	100+
56K004901	56R004990	Chloride LR + HR Drop Test	20-12,000mg/l Cl ⁻	100+
56K005001	56R005090	Chloride LR Drop Test	20-400mg/l Cl ⁻	100+
56K005101	56R005190	Chlorine (Free) HR Drop Test	15-300mg/l Cl ₂	100+
56K005201	56R005290	Chlorine (Free) LR Drop Test	1-30mg/l Cl ₂	100+
56K005301	--	Chlorine Spot Tester Kit (Disposable)	Trace Cl ₂	500+
56K005401	56R005450	Chlorine (Semi-quantitative) Test	0.1-50mg/l Cl ₂	50

Test Kit Code	Reagent Pack	Description	Range	Tests/Pack
56K005501	56R005590	Chlorine (Total Available) HR Drop Test	0.2-15% Cl ₂	100+
56K005601	56R005690	Chlorine (Total Available) LR + HR Drop Test	0.01-15% Cl ₂	100+
56K005701	56R005790	Chlorine (Total Available) LR Drop Test	100-2400mg/l Cl ₂	100+
56K005801	56R005890	Chlorine Dioxide HR Drop Test	25-350mg/l ClO ₂	100+
56K005901	56R005990	Chlorine Dioxide MR Drop Test	10-150mg/l ClO ₂	100+
56K006001	56R006090	Chlorine Dioxide LR Drop Test	0.08-30 mg/l ClO ₂	100+
56K006101	56R006190	EDTA (Free) Drop Test	0-2000mg/l EDTA	100+
56K006201	56R006290	Hardness (Calcium) HR Drop Test	50-600mg/l CaCO ₃	100+
56K006301	56R006390	Hardness (Calcium) LR Drop Test	5-60mg/l CaCO ₃	100+
56K006401	56R006490	Hardness (Total) LR + HR Drop Test	5-600mg/l CaCO ₃	100+
56K006501	56R006590	Hardness (Total) HR Drop Test	50-600mg/l CaCO ₃	100+
56K006601	56R006690	Hardness (Total) LR Drop Test	5-60mg/l CaCO ₃	100+
56K006701	56R006790	Hardness (Total/Calcium) HR Drop Test	50-600mg/l CaCO ₃	100+
56K006801	56R006890	Hardness Raw Water Drop Test	50-600mg/l CaCO ₃	100+
56K006901	56R006990	Hardness Stop/Go Drop Test	4mg/l CaCO ₃	100+
56K007001	--	Hardness (Temporary) Drop Test (Disposable)	9-540mg/l CaCO ₃	50+
56K007101	56R007190	Hardness Total/Calcium LR+HR	5-600mg/l CaCO ₃	100+
56K007201	56R007250	Hardness Yes/No Test Pack	8-20mg/l CaCO ₃	250
56K007301	56R007390	Hydrogen Peroxide Drop Test	15-500mg/l H ₂ O ₂	100+
56K007401	56R007490	Iron Spot Tester Drop Test Pack	Trace Fe	100+
56K007501	56R007590	Molybdate HR Drop Test (New)	25-400mg/l MoO ₄	100+
56K007601	56R007690	Molybdate MR Drop Test (New)	10-200mg/l MoO ₄	100+
56K007701	56R007790	Molybdate LR Drop Test (New)	5-40mg/l MoO ₄	100+
56K007801	56R007890	Molybdate LR Drop Test	2.5-20mg/l MoO ₄	100+
56K007901	56R007990	Nitrite Drop Test	10-2000mg/l NaNO ₂	100+
56K008001	56R008090	Oxygen (Available) Drop Test	0-500mg/l O ₂	100+
56K008101	56R008190	pH (Universal Indicator)	pH 4-10	100+
56K008201	56R008290	Peracetic Acid Drop Test	0-450mg/l CH ₃ CO ₃ H	100+
56K008301	56R008350	Phosphonate Drop Test	4-20mg/l HEDP	50+
56K008401	56R008490	Phosphonate Drop Test	4-20mg/l HEDP	100+
56K008501	56R008550	Polyacrylate Single Phase HR Drop Test	0-20mg/l PAA**	50+
56K008601	56R008650	Polyacrylate Single Phase LR Drop Test	0-20mg/l PAA**	50+
56K008701	56R008750	Polyacrylate Two Phase HR Drop Test	0-20mg/l PAA**	50+
56K008801	56R008850	Polyacrylate Two Phase LR Drop Test	0-20mg/l PAA**	50+
56K008901	56R008990	Quaternary Ammonium Compounds HR Drop Test	60-1800mg/l C.T.A.B.*	100+
56K009001	56R009090	Quaternary Ammonium Compounds LR Drop Test	40-300mg/l C.T.A.B.*	100+
56K009101	56R009190	Sulphite Drop Test	25-150mg/l Na ₂ SO ₃	100+
56K009201	56R009290	Tannin Drop Test	50-300mg/l Tannin	100+
56K009301	56R009390	Total Chelant Drop Test	0-2000mg/l EDTA	100+
56K009401	56R009490	Total Oxidant Drop Test (Chlorine Dioxide)	0.2-6.0mg/l ClO ₂	100+
56K009501	56R009550	Zinc (Free Soluble) Drop Test	1-10mg/l Zn ²⁺	50
56K009601	56R009650	Zinc (Total Complex) Drop Test	1-10mg/l Zn ²⁺	50

* Cetyl trimethyl ammonium bromide

** Polyacrylic Acid

Comparators





CHECKIT® Comparator
Page 18



Comparator 2000+
Page 32



Comparator EC Pt-Co
Page 50



CHECKIT® Comparator





CHECKIT® Comparator Test Kits are accurate, easy to use test kits for water analysis. Simply add the reagent to the sample cell, rotate the disc until the colour matches the prepared water sample and read the concentration value.

CHECKIT® Comparator

The Lovibond® CHECKIT® Comparator is a compact and handy colorimetric unit which is suitable for both mobile and static analysis work. Supplied with a generous number of different colour scales, it provides the basis for a comprehensive, easy-to-use colorimetric analysis system.

CHECKIT® Disc

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

Applications

- Water Treatment (e.g. Drinking Water)
- Pool Water
- Laboratory and Field Testing
- Special Applications

 Please see pages 22 onwards for tests, ranges and reagents



Front view of the CHECKIT® Comparator with cells



Rear view of the CHECKIT® Comparator with diffuser plate, cells and disc



Complete Test Kit with reagent in carrying case, ready to use



Plastic cells, frosted on two sides, volume 10 ml, path length 13.5 mm, with lids



CHECKIT® Discs with continuous and stable scales



Tablet reagents in blister packaging



Plastic cells in pack, available:

- 5 cells - 14 55 05
- 10 cells - 14 55 00
- 100 cells - 14 55 10

Delivery content

- CHECKIT® Comparator
- CHECKIT® Disc(s)
- Reagents for an average of 30 tests
- Cuvettes
- Accessories
- Instruction manual
- Warranty information
- in portable case

Single Parameter Test Kits

Test		Range* (± 5 % F.S.)	Best.-Nr.
Acid Capacity K _{54.3}		0.5 - 5 mmol/l	14 74 60
Aluminium		0 - 0.3 mg/l Al	14 72 00
Ammonia	★	0 - 1 mg/l N	14 72 10
Ammonium, Powder Pack		0 - 0.5 mg/l N	14 72 11
Bromine	🌿	0 - 5 mg/l Br	14 72 80
Chlorine (DPD)** free, combined, total	★ 🌿	0.02 - 0.3 mg/l Cl ₂	14 70 00
Chlorine (DPD) free, combined, total	★ 🌿	0 - 1 mg/l Cl ₂	14 70 10
Chlorine (DPD) free, combined, total	★ 🌿	0 - 2 mg/l Cl ₂	14 70 40
Chlorine, free (DPD), Powder Pack		0 - 3.5 mg/l Cl ₂	14 70 50
Chlorine, total (DPD), Powder Pack	★	0 - 3.5 mg/l Cl ₂	14 70 51
Chlorine free + total (DPD), Powder Packs	★	0 - 3.5 mg/l Cl ₂	14 70 52
Chlorine (DPD) free, combined, total	🌿	0 - 4 mg/l Cl ₂	14 70 20
Chlorine KI		10 - 300 mg/l Cl ₂ (total)	14 70 30
Chlorine dioxide**		0.01 - 0.2 mg/l ClO ₂	14 73 30
Copper, free (Cu ²⁺)		0 - 1 mg/l Cu	14 72 30
Copper HR, free + total		0 - 5 mg/l Cu	14 74 30
Copper HR, free, Powder Pack		0 - 5 mg/l Cu	14 74 31
Copper LR**, free + total		0 - 1 mg/l Cu	14 74 40
Copper LR**, free, Powder Pack		0 - 1 mg/l Cu	14 74 41
DEHA		0 - 0.5 mg/l DEHA	14 73 70
Fluoride, Testpak available only		0.2 - 2 mg/l F ⁻	
Iron HR		0 - 10 mg/l Fe	14 73 20
Iron LR		0.05 - 1 mg/l Fe	14 72 20
Iron (TPTZ), Powder Pack		0 - 1.8 mg/l Fe	14 74 70
Manganese LR, Testpak available only		0.1 - 0.7 mg/l Mn	
Manganese VLR**, Testpak available only		0.02 - 0.2 mg/l Mn	
Molybdate LR**		0 - 10 mg/l MoO ₄	14 72 91
Molybdate HR		0 - 100 mg/l MoO ₄	14 72 90
Molybdate HR		50 - 500 mg/l MoO ₄	14 72 95
Nitrate LR, Testpak available only		0 - 1 mg/l NO ₃	
Nitrite LR		0 - 0.5 mg/l N	14 73 00
Nitrite, Powder Pack		0 - 0.3 mg/l N	14 73 01
Ozon (DPD), in the presence of chlorine		0 - 1.0 mg/l O ₃	14 72 70
Ozon (DPD)	🌿	0 - 1.0 mg/l O ₃	14 72 75
pH value (Phenol red)	🌿	6.5 - 8.4 pH	14 71 00
pH value (Bromocresol purple)		5.2 - 6.8 pH	14 71 10
pH value (Bromocresol purple)		6.0 - 7.6 pH	14 71 20
pH value (Universal)		4 - 10 pH	14 71 30
Phosphate, Powder Pack		0 - 2.5 mg/l PO ₄	14 74 80
Phosphate HR	★	0 - 80 mg/l PO ₄	14 72 50
Phosphate LR		0 - 4 mg/l PO ₄	14 72 40
Silica LR		0.25 - 4 mg/l SiO ₂	14 73 50
Silica HR, Powder Pack		0 - 100 mg/l SiO ₂	14 73 51
Silica VLR**		0 - 1 mg/l SiO ₂	14 73 60
Sodium hypochlorit		2 - 18 %	14 74 90
Sulfite LR		0.5 - 10 mg/l SO ₃	14 73 80
Total Alkalinity		20 - 240 mg/l CaCO ₃	14 74 50
Zinc LR		0 - 1 mg/l Zn	14 73 40

* Disc readings see following pages
 ** Only with CHECKIT® Comparator D55
 with mirror optics (path length 55 mm)

🌿 Green Chemistry
 ★ also suitable for seawater

Test Kits 2in1

Test Kit	Code
Chlorine 0 – 1.0 mg/l Cl ₂ * 🌿	14 70 15
pH value 6.5 – 8.4 pH	
Pool version	14 70 16
Chlorine 0.1 – 2.0 mg/l Cl ₂ * 🌿	14 70 45
pH value 6.5 – 8.4 pH	
Pool version	14 70 46
Chlorine 0 – 4.0 mg/l Cl ₂ * 🌿	14 70 25
pH value 6.5 – 8.4 pH	
Pool version	14 70 26
Bromine 0 – 5.0 mg/l Br 🌿	14 72 85
pH value 6.5 – 8.4 pH	
Copper 0 – 1.0 mg/l Cu	14 72 35
pH value 6.5 – 8.4 pH	

Testpak

Water Balance	Code
Chlorine 0 – 4.0 mg/l Cl ₂ *	14 70 28
pH value 6.5 – 8.4 pH	
Cyanuric acid (Turbidity method)**	
20 – 200 mg/l Cys	
Calcium hardness (Speed-Test)**	
20 – 800 mg/l CaCO ₃	
Total Alkalinity (M) (Speed-Test)**	
20 – 800 mg/l CaCO ₃	

Disc readings see following pages.
 *All test kits for chlorine are for "free, combined and total chlorine".
 **Reagents for turbidity method and speed test (Test-Kit 5 in 1) see MINIKIT.

The Testpak concept makes it easy to add new parameters to the CHECKIT® Comparator.

The only requirement is the CHECKIT® Comparator as the basic unit, Code: 14 50 00.

For test paks, see the following pages.



CHECKIT® Comparator

Tests, Test Kits, Testpaks, Discs, Reagents

Test	Range	Readings (Accuracy ± 5 % Full Scale)	Test Kit	Testpak
Aluminium	0 - 0.3 mg/l Al	0 / 0.01 / 0.02 / 0.03 / 0.04 / 0.05 / 0.06 / 0.07 / 0.08 / 0.09 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3	14 72 00	14 77 00
Ammonia	0 - 1 mg/l N	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7 / 0.75 / 0.8 / 0.9 / 0.95 / 1.0	14 72 10	14 77 10
Ammonia VARIO	0 - 0.5 mg/l N	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5	14 72 11	14 77 11
Bromine	0 - 5 mg/l Br	0 / 0.2 / 0.4 / 0.6 / 0.8 / 1.0 / 1.2 / 1.4 / 1.6 / 1.8 / 2 / 2.5 / 3 / 3.5 / 4 / 4.5 / 5	14 72 80	14 77 80
Chlorine free, combined**, total	0 - 1 mg/l Cl ₂	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7 / 0.75 / 0.8 / 0.85 / 0.9 / 0.95 / 1.0	14 70 10	14 75 10
Chlorine free, combined**, total	0 - 2 mg/l Cl ₂	0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0 / 1.1 / 1.2 / 1.3 / 1.4 / 1.6 / 1.8 / 2.0	14 70 40	14 75 40
Chlorine free, combined**, total	0 - 4 mg/l Cl ₂	0 / 0.2 / 0.4 / 0.6 / 0.8 / 1.0 / 1.2 / 1.4 / 1.6 / 1.8 / 2.0 / 2.5 / 3.0 / 3.5 / 4.0	14 70 20	14 75 20
Chlorine free, combined**, total	0 - 3.5 mg/l Cl ₂	0 / 0.2 / 0.4 / 0.6 / 0.8 / 1 / 1.2 / 1.4 / 1.6 / 1.8 / 2 / 2.2 / 2.4 / 2.6 / 2.8 / 3 / 3.2 / 3.4 / 3.5	14 70 52	14 75 50, free 14 75 51, total
Chlorine free, combined**, total **may be calculated by deducting free from = total chlorine	0.02 - 0.3 mg/l Cl ₂	0.02 / 0.03 / 0.04 / 0.05 / 0.06 / 0.07 / 0.08 / 0.09 / 0.1 / 0.11 / 0.12 / 0.13 / 0.14 / 0.15 / 0.16 / 0.17 / 0.18 / 0.19 / 0.2 / 0.22 / 0.24 / 0.26 / 0.28 / 0.3 only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm) Code: 14 50 10	14 70 00	14 75 00

* RAPID: fast dissolving tablet
including stirring rod



Disc	Reagent	Quantity	Code
14 62 00	ALUMINIUM No.1	100	51 54 60 BT
		250	51 54 61 BT
	ALUMINIUM No.2	100	51 54 70 BT
		250	51 54 71 BT
	Combi pack#	each 100	51 76 01 BT
	ALUMINIUM No.1 / No.2	each 250	51 76 02 BT
14 62 10	AMMONIA No.1	100	51 25 80 BT
		250	51 25 81 BT
	AMMONIA No.2	100	51 25 90 BT
		250	51 25 91 BT
	Combi pack#	each 100	51 76 11 BT
	AMMONIA No.1 / No.2	each 250	51 76 12 BT
14 62 11	VARIO Ammonia Salicylate F10 VARIO Ammonia Cyanurate F10	Powder Pack / 200 Powder Pack / 200 Set	53 55 00
14 62 80	DPD No.1-RAPID* 	100	51 13 10 BT
		250	51 13 11 BT
		500	51 13 12 BT
14 60 10	DPD No.1-RAPID* 	100	51 13 10 BT
		250	51 13 11 BT
		500	51 13 12 BT
	DPD No.3-RAPID* 	100	51 12 90 BT
		250	51 12 91 BT
		500	51 12 92 BT
	DPD No.4-RAPID* 	100	51 15 70 BT
		250	51 15 71 BT
		500	51 15 72 BT
14 60 40	DPD No.1/3/4-RAPID* 		
14 60 20	DPD No.1/3/4-RAPID* 		
14 60 50	VARIO Chlorine Free DPD F5 	100	53 00 90
	VARIO Chlorine Total DPD F5 	100	53 00 80
14 60 00	DPD No.1 	100	51 10 50 BT
		250	51 10 51 BT
		500	51 10 52 BT
	DPD No.3 	100	51 10 80 BT
		250	51 10 81 BT
		500	51 10 82 BT
	Combi pack# 	each 100	51 77 11 BT
	DPD No.1 / No.3	each 250	51 77 12 BT



CHECKIT® Discs

Material Safety Data Sheets: www.lovibond.com

f) additionally required for determination of chlorine dioxide / ozone in the presence of chlorine

 Green Chemistry



CHECKIT® Comparator

Tests, Test Kits, Testpaks, Discs, Reagents

Test	Range	Readings (Accuracy ± 5 % Full Scale)	Test Kit	Testpak
Chlorine KI total only	10 - 300 mg/l Cl ₂	10 / 20 / 30 / 40 / 50 / 60 / 70 / 80 / 90 / 100 / 110 / 120 / 130 / 140 / 150 / 160 / 170 / 180 / 190 / 200 / 250 / 300	14 70 30	14 75 30
Chlorine dioxide	0.01 - 0.2 mg/l ClO ₂	0.01 / 0.02 / 0.03 / 0.04 / 0.05 / 0.06 / 0.07 / 0.08 / 0.09 / 0.1 / 0.11 / 0.12 / 0.13 / 0.14 / 0.15 / 0.16 / 0.17 / 0.18 / 0.19 / 0.2 only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm) Code: 14 50 10	14 73 30	14 78 30
DEHA	0 - 0.5 mg/l DEHA	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5	14 73 70	14 78 70
Iron LR	0 - 1 mg/l Fe	0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7 / 0.75 / 0.8 / 0.9 / 1.0	14 72 20	14 77 20
Iron HR	1 - 10 mg/l Fe	1 / 1.5 / 2 / 2.5 / 3 / 3.5 / 4 / 4.5 / 5 / 5.5 / 6 / 6.5 / 7 / 7.5 / 8 / 8.5 / 9 / 10	14 73 20	14 78 20
Iron (TPTZ)	0 - 1.8 mg/l Fe	0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1 / 1.1 / 1.2 / 1.3 / 1.4 / 1.5 / 1.6 / 1.7 / 1.8	14 74 70	14 79 70
Fluoride Testpak available only	0.2 - 2 mg/l F	0.2 / 0.4 / 0.6 / 0.8 / 1.0 / 1.2 / 1.4 / 1.6 / 1.8 / 2.0	-	14 78 90
Copper, free (Cu²⁺)	0 - 1 mg/l Cu	0 / 0.1 / .2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0	14 72 30	14 77 30
Copper LR free and total	0 - 1 mg/l Cu	0 / 0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0 only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm)	14 74 40	14 79 40
Copper LR, only free	0 - 1 mg/l Cu	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0 only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm)	14 74 41	14 79 41

* RAPID: fast dissolving tablet
including stirring rod



Disc	Reagent	Quantity	Code
14 60 30	CHLORINE HR (KI)	100	51 30 00 BT
		250	51 30 01 BT
	ACIDIFYING GP	100	51 54 80 BT
		250	51 54 81 BT
	Combi pack [#]	each 100	51 77 21 BT
	CHLORINE HR (KI)/ACIDIFYING GP	each 250	51 77 22 BT
14 63 30	DPD No. 1 	100	51 10 50 BT
		250	51 10 51 BT
	DPD Glycine ^{f)}	100	51 21 70 BT
		250	51 21 71 BT
	Combi pack [#]	each 100	51 77 31 BT
	DPD No.1 / GLYCINE	each 250	51 77 32 BT
14 63 70	DEHA	100	51 32 20 BT
		250	51 32 21 BT
	DEHA Solution	15 ml	46 11 85
	DEHA Solution	100 ml	46 11 81
14 62 20	IRON LR (Fe ²⁺ und Fe ³⁺)	100	51 53 70 BT
		250	51 53 71 BT
	IRON (II) LR (Fe ²⁺)	100	51 54 20 BT
14 63 20	IRON HR	100	51 53 80 BT
		250	51 53 81 BT
14 64 70	Vario Iron TPTZ F10	100	53 05 50
14 63 90	SPADNS reagent solution	250 ml	46 74 81
		500 ml	46 74 82
	Help for pipette	1	36 50 55
	Pipette 2 ml	1	36 50 50
14 62 30	COPPER/ZINC LR	100	51 26 20 BT
		250	51 26 21 BT
14 64 40	COPPER No. 1 	100	51 35 50 BT
		250	51 35 51 BT
	COPPER No. 2	100	51 35 60 BT
		250	51 35 61 BT
	Combi pack [#]	each 100	51 76 91 BT
	COPPER No.1 / No.2	each 250	51 76 92 BT
14 64 41	Vario Cu1 F10	100	53 03 00



Test Kit complete in case

Material Safety Data Sheets: www.lovibond.com

f) additionally required for determination of chlorine dioxide / ozone in the presence of chlorine





CHECKIT® Comparator

Tests, Test Kits, Testpaks, Discs, Reagents

Test	Range	Readings (Accuracy ± 5 % Full Scale)	Test Kit	Testpak
Copper HR free and total	0 - 5 mg/l Cu	0 / 0.5 / 1.0 / 1.5 / 2.0 / 2.5 / 3.0 / 3.5 / 4.0 / 4.5 / 5.0	14 74 30	14 79 30
Copper HR, free only	0 - 5 mg/l Cu	0 / 0.5 / 1 / 1.5 / 2 / 2.5 / 3 / 3.5 / 4 / 5	14 74 31	14 79 31
Manganese LR Testpak available only	0.1 - 0.7 mg/l Mn	0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7	-	14 79 10
Manganese VLR Testpak available only	0.02 - 0.2 mg/l Mn	0.02 / 0.03 / 0.04 / 0.05 / 0.06 / 0.07 / 0.08 / 0.09 / 0.1 / 0.11 / 0.12 / 0.13 / 0.14 / 0.15 / 0.16 / 0.18 / 0.2 only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm)	-	14 79 20
Molybdate HR	0 - 100 mg/l MoO ₄	0 / 5 / 10 / 15 / 20 / 25 / 30 / 35 / 40 / 45 / 50 / 55 / 60 / 65 / 70 / 75 / 80 / 85 / 90 / 95 / 100	14 72 90	14 77 90
Molybdate HR	50 - 500 mg/l MoO ₄	50 / 100 / 150 / 200 / 250 / 300 / 500	14 72 95	14 77 95
Molybdate LR	0 - 10 mg/l MoO ₄	0 / 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm)	14 72 91	14 77 91

* RAPID: fast dissolving tablet
including stirring rod



Disc	Reagent	Quantity	Code
14 64 30	COPPER No. 1 	100	51 35 50 BT
		250	51 35 51 BT
	COPPER No. 2	100	51 35 60 BT
		250	51 35 61 BT
	Combi pack#	each 100	51 76 91 BT
	COPPER No.1 / No.2	each 250	51 76 92 BT
14 64 31	Vario Cu1 F10	100	53 03 00
14 64 10	VARIO Manganese Reagent, LR F10	1 Set	53 50 90
	consists of:		
	VARIO Alkaline-Cyanide Solution	60 ml	
	Vario Ascorbic Acid	100	53 06 40
	Vario PAN Indicator Solution	60 ml	
	Accessories:		
14 64 20	VARIO Manganese Reagent, LR F10	1 Set	53 50 90
	consists of:		
	VARIO Alkaline-Cyanide Solution	60 ml	
	Vario Ascorbic Acid	100	53 06 40
	Vario PAN Indicator Solution	60 ml	
	Accessories:		
14 62 90	MOLYBDATE No. 1 HR	100	51 30 60 BT
		250	
	MOLYBDATE No. 2 HR	100	
		250	51 30 71 BT
	Combi pack#	each 100	
	MOLYBDATE No.1 HR / No.2 HR	each 250	
14 62 95	MOLYBDATE No. 1 HR	100	51 30 60 BT
		250	
	MOLYBDATE No. 2 HR	100	
		250	51 30 71 BT
	Combi pack#	each 100	
	MOLYBDATE No.1 HR / No.2 HR	each 250	
14 62 91	MOLYBDATE No. 1 HR	100	51 30 60 BT
		250	
	MOLYBDATE No. 2 HR	100	
		250	51 30 71 BT
	Combi pack#	each 100	
	MOLYBDATE No.1 HR / No.2 HR	each 250	



Plastic cells, volume 10 ml

Material Safety Data Sheets: www.lovibond.com

f) additionally required for determination of chlorine dioxide / ozone in the presence of chlorine



Green Chemistry



CHECKIT® Comparator

Tests, Test Kits, Testpaks, Discs, Reagents

Test	Range	Readings (Accuracy ± 5 % Full Scale)	Test Kit	Testpak
Sodiumhypochlorite	2 - 18 %	2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15 / 16 / 18	14 74 90	14 79 90
Nitrate LR to order as a testpak only	0 - 1 mg/l N	0 / 0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0	-	14 78 10
Nitrite LR	0 - 0.5 mg/l N	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5	14 73 00	14 78 00
Nitrite VARIO	0 - 0.3 mg/l N	0 / 0.01 / 0.02 / 0.03 / 0.04 / 0.05 / 0.06 / 0.07 / 0.08 / 0.09 / 0.10 / 0.11 / 0.12 / 0.13 / 0.14 / 0.15 / 0.16 / 0.17 / 0.18 / 0.19 / 0.20 / 0.21 / 0.22 / 0.23 / 0.24 / 0.25 / 0.26 / 0.27 / 0.28 / 0.29 / 0.30	14 73 01	14 78 01
Ozone (DPD) in the presence of chlorine	0 - 1.0 mg/l O ₃	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7 / 0.75 / 0.8 / 0.9 / 1.0	14 72 70	14 77 70
Ozone (DPD)	0 - 1.0 mg/l O ₃	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7 / 0.75 / 0.8 / 0.9 / 1.0	14 72 75 	14 77 75 
pH	5.2 - 6.8 pH	5.2 / 5.3 / 5.4 / 5.5 / 5.6 / 5.7 / 5.8 / 5.9 / 6.0 / 6.1 / 6.2 / 6.3 / 6.4 / 6.5 / 6.6 / 6.7 / 6.8	14 71 10	14 76 10
	6.0 - 7.6 pH	6.0 / 6.1 / 6.2 / 6.3 / 6.4 / 6.5 / 6.6 / 6.7 / 6.8 / 6.9 / 7.0 / 7.1 / 7.2 / 7.3 / 7.4 / 7.5 / 7.6	14 71 20	14 76 20
	6.5 - 8.4 pH	6.5 / 6.6 / 6.7 / 6.8 / 6.9 / 7.0 / 7.1 / 7.2 / 7.3 / 7.4 / 7.5 / 7.6 / 7.7 / 7.8 / 7.9 / 8.0 / 8.1 / 8.2 / 8.3 / 8.4	14 71 00 	14 76 00 
pH-Universal	4 - 10 pH	4 / 4.5 / 5 / 5.5 / 6 / 6.5 / 7 / 7.5 / 8 / 8.5 / 9 / 9.5 / 10	14 71 30	14 76 30
Phosphate LR	0 - 4 mg/l PO ₄	0 / 0.25 / 0.5 / 0.75 / 1.0 / 1.25 / 1.5 / 1.75 / 2.0 / 2.25 / 2.5 / 2.75 / 3.0 / 3.25 / 3.5 / 3.75 / 4.0	14 72 40	14 77 40

* RAPID: fast dissolving tablet
including stirring rod



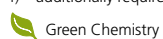
Disc	Reagent	Quantity	Code
14 64 90	CHLORINE HR (KI)	100	51 30 00 BT
		250	51 30 01 BT
	ACIDIFYING GP	100	51 54 80 BT
		250	51 54 81 BT
	Combi pack [#]	each 100	51 77 21 BT
	CHLORINE HR (KI)/ACIDIFYING GP	each 250	51 77 22 BT
14 63 10	Dilution set for sample preparation	1	41 44 70
	NITRITE LR	100	51 23 10BT
		250	51 23 11BT
	NITRATE-Test tablets	100 (bottle)	50 28 10
	NITRATE Test powder	15 g	46 52 30
14 63 00	NITRATE Test tubes	1	36 62 20
14 63 00	NITRITE LR	100	51 23 10BT
		250	51 23 11BT
14 63 01	VARIO Nitri 3 F10	Powder Pack / 100	53 09 80
14 62 70	DPD No. 4 	100	51 12 20 BT
		250	51 12 21 BT
	DPD Glycine ^{f)}	100	51 21 70 BT
		250	51 21 71 BT
14 62 75	DPD No. 4 	100	51 12 20 BT
		250	51 12 21 BT
14 61 10	BROMOCRESOL PURPLE	100	51 17 30
14 61 20		250	51 17 31
	BROMOTHYMOL BLUE	100	51 16 40 BT
14 61 00		250	51 16 41 BT
	PHENOL RED-RAPID* 	100	51 17 90 BT
		250	51 17 91 BT
14 61 30	UNIVERSAL PH	100	51 54 40
		250	51 54 41
14 62 40	PHOSPHATE No. 1 LR	100	51 30 40 BT
	PHOSPHATE No. 2 LR	100	51 30 50 BT
	Combi pack [#]	each 100	51 76 51 BT
	PHOSPHATE No.1 LR / No.2 LR		



CHECKIT® Comparator with powder reagent / tablets

Material Safety Data Sheets: www.lovibond.com

f) additionally required for determination of chlorine dioxide / ozone in the presence of chlorine





CHECKIT® Comparator

Tests, Test Kits, Testpaks, Discs, Reagents

Test	Range	Readings (Accuracy ± 5 % Full Scale)	Test Kit	Testpak
Phosphate HR	0 - 80 mg/l PO ₄	0 / 5 / 10 / 15 / 20 / 25 / 30 / 35 / 40 / 45 / 50 / 55 / 60 / 65 / 70 / 75 / 80	14 72 50	14 77 50
Phosphate	0 - 2.5 mg/l PO ₄	0 / 0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1 / 1.1 / 1.2 / 1.3 / 1.4 / 1.5 / 1.6 / 1.7 / 1.8 / 1.9 / 2 / 2.1 / 2.2 / 2.3 / 2.4 / 2.5	14 74 80	14 79 80
Acid capacity K_{s4.3}	0.5 - 5 mmol/l	0.5 / 1 / 1.5 / 2 / 2.5 / 3 / 3.5 / 4 / 5	14 74 60	14 79 60
Silica LR	0.25 - 4 mg/l SiO ₂	0.25 / 0.5 / 0.75 / 1.0 / 1.25 / 1.5 / 1.75 / 2.0 / 2.5 / 3.0 / 3.5 / 4	14 73 50	14 78 50
Silica HR VARIO	0 - 100 mg/l SiO ₂	0 / 10 / 20 / 30 / 40 / 50 / 60 / 70 / 80 / 90 / 100	14 73 51	14 78 51
Silica VLR	0 - 1 mg/l SiO ₂	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0	14 73 60	14 78 60
Sulfite LR	0.5 - 10 mg/l SO ₃ ²⁻	0.5 / 1 / 1.5 / 2 / 2.5 / 3 / 3.5 / 4 / 4.5 / 5 / 6 / 7 / 8 / 9 / 10	14 73 80	14 78 80
Total Alkalinity	20 - 240 mg/l CaCO ₃	20 / 30 / 40 / 50 / 60 / 70 / 80 / 90 / 100 / 110 / 120 / 130 / 140 / 150 / 160 / 170 / 180 / 190 / 200 / 220 / 240	14 74 50	14 79 50
Zinc LR	0 - 1 mg/l Zn	0 / 0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0	14 73 40	14 78 40

* RAPID: fast dissolving tablet
including stirring rod

Disc	Reagent	Quantity	Code
14 62 50	PHOSPHATE HR	100	51 19 80 BT
14 64 80	Vario PHOS 3 F10	100	53 15 50
14 64 60	ALKACHECK	100 250	51 32 00 BT 51 32 01 BT
14 63 50	SILICA No. 1	100	51 31 30 BT
	SILICA No. 2	250	51 31 31 BT
	Combi pack [#]	100	51 31 40 BT
	SILICA No.1 / No.2	250	51 31 41 BT
	SILICA PR	each 100	51 76 71 BT
		each 200	51 76 72 BT
		100	51 31 50 BT
		250	51 31 51 BT
14 63 51	Vario Silica HR Molybdate F10	Powder Pack / 100	53 57 00
	Vario Silica HR Acid Rgt F10	Powder Pack / 100	
	Vario Silica HR Citric Acid F10	Powder Pack / 100	
		Set	
14 63 60	SILICA No. 1	100	51 31 30 BT
		250	51 31 31 BT
	SILICA No. 2	100	51 31 40 BT
		250	51 31 41 BT
	Combi pack [#]	each 100	51 76 71 BT
		each 200	51 76 72 BT
	SILICA No.1 / No.2	100	51 31 50 BT
	SILICA PR	250	51 31 51 BT
14 63 80	SULFITE LR	100	51 80 20 BT
14 64 50	ALKACHECK	100 250	51 32 00 BT 51 32 01 BT
14 63 40	COPPER/ZINC LR	100	51 26 20 BT
	EDTA	250	51 26 21 BT
	DECHLOR	100	51 23 90 BT
		250	51 23 91 BT
		100	51 23 50 BT



CHECKIT® Discs



Comparator 2000+



Colorimeter for regular testing with colour-stable glass standards

Comparator 2000+

With its accessories, the Lovibond® Comparator system 2000+ is an extremely versatile, modular system for testing water. It is simple to use yet is uncompromising in terms of precision and reproducibility of results. It is compact and portable. The integrated prism brings the glass standards of the test discs and the coloured sample into the same field of view.

Test discs

The required accuracy of results is only ensured if stable, fade-free colour standards are used.

Glass colour standards are fade-free, resistant to chemicals and scratchproof. Lovibond® standards are made from coloured glass filters. They comply with international standards, e.g. ISO 7393/2.

Please see the table on page 36 for information on the various test discs or refer to our **disc catalogue Lovibond Comparator 2000+**.

Lighting unit

We recommend the use of the battery-operated Lovibond® lighting unit in variable lighting conditions. This guarantees uniform lighting conditions, and ensures greater test accuracy.

Cells

We manufacture precision plastic and optical glass cells in line with the highest quality standards. The cells ensure high accuracy and reproducibility of results.



Comparator 2000+



Lighting unit TK 102



Plastic cells



Test disc with colour-stable glass standards

Applications

- Water Treatment (e.g. Drinking Water)
- Pool Water
- Research Centres
- Universities
- Special Applications
- Laboratory and Field Testing

 Order codes see page 36



Comparator 2000+ Test Kits

Complete kits for water analysis

Scope of delivery for standard kits

Comparator test kits are supplied as a complete system in a sturdy plastic case. Together with the Comparator 2000+ and test discs, each kit includes all the necessary cells, accessories and Lovibond® tablet reagents (for 100 measurements) to achieve reliable results.

The table to the right shows a selection of the most popular standard test kits. The entire product range can be found in the special catalog for Comparator 2000+.

Customised equipment

In addition to supplying standard test kits, we can construct customised kits to suit individual requirements.

Based on the desired test parameters and measuring ranges we will draw up a detailed offer to suit your application.

Optional accessory

All test kit versions allow integration of the battery-operated portable lighting unit TK 102.

Operating instructions

The operating 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 in the minimum of time.



Example of a comparator test kit, together with daylight unit

Type	Designation/Combi	Test	Range*	Code
AF 270	Mini Lab Pool Water	Aluminium Ammonia Chlorine Chloride** Cyanuric Acid (Cys)** Iron Alkalinity-m** pH-value Sulphate**	0 - 0.5 mg/l Al 0 - 0.4 mg/l N 0.1 - 1.0 mg/l Cl ₂ 1.0 - 4.0 mg/l Cl ₂ 5 - 5000 mg/l Cl ⁻ 0 - 80 mg/l 0.1 - 1.0 mg/l Fe 20 - 800 mg/l CaCO ₃ 5.2 - 6.8 pH 6.8 - 8.4 pH 40 - 4000 mg/l SO ₄	41 27 00
AF 357	Drinking Water	Chloride (salinity) Chlorine Fluoride Hardness Total Hazen pH-value	0 - 5000 mg/l Cl ⁻ 0.02 - 0.3 mg/l Cl ₂ 0.2 - 4 mg/l Cl ₂ 0 - 1.6 mg/l F ⁻ 0 - 500 mg/l CaCO ₃ 10 - 90 mg/l Pt 6 - 8.4 pH	41 35 70
AF 358	Sewage and Domestic Effluents	Ammonia Chlorine Nitrite Permanganate (BOD) pH-value Sulphide	0 - 1 mg/l N 0.1 - 1 mg/l Cl ₂ 1 - 10 mg/l Cl ₂ 0.05 - 0.5 mg/l N 0 - 60 mg/l 4 - 8 ; 8 - 9.6 pH 0 - 0.5 mg/l S	41 35 80
AF 368	Mini Lab Heavy Metals (supplied without reagents)	Chromium Copper Cyanide Nickel Zinc	0.4 - 4 mg/l Cr 0.05 - 1 mg/l Cn 2.5 - 50 µg Cu 1 - 10 mg/l Ni 0 - 50 µg Zn	41 36 80
Type	Designation/Combi	Test	Range*	Code
AF 274	Amine	Amine	1 - 10 mg/l	41 27 40
AF 112A	Chlorine free, comb. tot.	Chlorine	0.1 - 1 mg/l Cl ₂	41 11 20
AF 112B	Chlorine free, comb. tot.	Chlorine	0.2 - 4 mg/l Cl ₂	41 11 30
AF 112E	Chlorine free, comb. tot.	Chlorine	0.02 - 0.3 mg/l Cl ₂	41 12 50
AF 112E/F	Chlorine free, comb. tot.	Chlorine Chlorine	0.02 - 0.3 mg/l Cl ₂ 0.2 - 0.8 mg/l Cl ₂	41 11 26
AF 112J/J	Chlorine free, comb. tot.	Chlorine pH-value	0.1 - 2.0 mg/l Cl ₂ 6.8 - 8.4 pH	41 72 46
AF 112N/T	Chlorine free, comb. tot.	Chlorine Chlorine	0.1 - 1.0 mg/l Cl ₂ 1.1 - 2.0 mg/l Cl ₂	41 01 20
AF 112ED	Chlorine dioxide	Chlorine dioxide	0.04 - 0.57 mg/l ClO ₂	41 00 01
AF 112 EF/ED	Chlorine dioxide	Chlorine dioxide	0.04 - 1.52 mg/l ClO ₂	41 00 07
AF 116A	Chlorine, pH	Chlorine pH-value	0.1 - 1 mg/l Cl ₂ 6.8 - 8.4 pH	41 11 40
AF 116B	Chlorine, pH	Chlorine pH-value	0.2 - 4 mg/l Cl ₂ 6.8 - 8.4 pH	41 11 60
AF 118S	Chlorine, pH	Chlorine pH-value	0.1 - 4 mg/l Cl ₂ 5.2 - 8.4 pH	41 11 81
AF 139	Sodium hypochlorite	Sodium hypochlorite	2 - 18 % NaOCl	41 13 90
AF 129	Water Balance			41 12 90

* Disc readings see following pages

** Rapid Tests

Green Chemistry



Comparator 2000+ and Accessories

Type	Item	Code
TK 100	Comparator 2000+	14 20 00
TK 102	Portable lighting unit, battery operated	14 20 50
	Daylight Unit for Comparator 2000+, mains operated	17 10 10
AF 631	Water sampler with two 500 ml bottles and one lid	17 05 00
	Measuring beaker, 100 ml	38 48 01
	Vial stand for 10 vials (ø 16 mm or □ 13.5 mm), acrylic glass	41 89 57
	Glass stirring rod, 12 cm length	36 41 10
	Plastic stirring rod, 13 cm length	36 41 00
	Brush, 11 cm length	38 02 30
Type	Item	Code
Glass Cells		
DB424/S	5 glass cells, 13.5 mm path length 13.5 mm path length, volume 10 ml, with lid	35 42 43
W680/40	Glass cell 40 mm path length, calibrated at 20 ml	60 68 90
Plastic Cells		
	5 plastic cells, frosted on two sides, 13.5 mm path length, volume 10 ml, with lid	14 55 05
	10 plastic cells, as 14 55 05	14 55 00
	100 plastic cells, as 14 55 05	14 55 10

Glass cell with lid, volume 10 ml, calibrated 2 - 12 ml, path length 13.5 mm, Pack of 5, code: 35 42 43



Nessleriser System and Accessories

Type	Item	Code
2150	Nessleriser 2150 with stand, daylight unit and AF 306/P	17 20 30
2150	Nessleriser 2150 with stand	17 21 50
2150	Nessleriser 2150 upgrade kit	17 21 60
2250	Nessleriser 2250 with stand, daylight unit and DB 420	17 20 40
2250	Nessleriser 2250 with stand	17 22 50
2250	Nessleriser 2250 upgrade kit with Nessler tubes DB 420	17 21 70
	Daylight Unit for Nessleriser, mains operated	17 10 20
	Stand for Nessleriser upgrade kit	17 21 80
AF 306/S	Stand for 12 Nessler tubes	17 02 90
AF 306	Pair Nessler tubes, 113 mm	35 30 60
AF 306/P	Pair Nessler tubes, 113 mm with plungers	35 30 80
	Plunger for Nessler tube AF 306 and AF 306/P	35 30 70
DB 420	Pair Nessler tubes, 250 mm with plungers	35 42 00
	Plunger for Nessler tube DB 420	35 42 29
AF 315	Special Nessler tube (determination of oxygen with disc NOE)	35 31 50



Nessleriser with daylight



Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	Code Colour disc
Aluminium	3/127 A	0; 0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,4; 0,5 mg/l	0 - 0.5 mg/l	23 02 05
Amine	3/58	1; 2; 3; 4; 5; 6; 7; 8; 10 mg/l	1.0 - 10 mg/l	23 58 00
Amine	3/64	0; 0,25; 0,5; 1; 2 mg/l	0 - 2 mg/l	23 64 00
Ammonia	3/112	0; 0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,35; 0,4 mg/l	0 - 0.4 mg/l NH ₄	23 00 60
Ammonia	3/113	0; 0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,8; 1 mg/l	0 - 1.0 mg/l N	23 00 70
Ammonia	3/125	0; 1; 2; 3; 4; 5; 6; 8; 10 mg/l	0 - 10 mg/l N	23 01 80
Ammonia	NAA	1; 2; 3; 4; 5; 6; 8; 10 µg (50 ml probe)	0.02- 0.2 mg/l NH ₃	28 31 10
Ammonia	NAB	10; 12; 14; 16; 18; 20; 22; 24; 26 µg (50 ml probe)	0.2- 0.52 mg/l NH ₃	28 31 20
Ammonia	NAC	28; 32; 36; 40; 44; 48; 52; 56; 60 µg (50 ml probe)	0.56- 1.2 mg/l NH ₃	28 31 30
Ammonia	NAD	60; 65; 70; 75; 80; 85; 90; 95; 100 µg (50 ml probe)	1.2 - 2 mg/l NH ₃	28 31 40
Bromine	3/53A	0,2; 0,4 ; 0,6; 0,8; 1; 1,2; 1,4; 1,6; 2 mg/l	0.2 - 2.0 mg/l	23 53 10
Bromine	3/53B	1; 2; 3; 4; 5; 6; 7; 8; 10 mg/l	1.0 - 10 mg/l	23 53 20
Bromine	3/53C	0,5; 1; 1,5; 2; 2,5; 3; 4; 5; 6 mg/l	0.5 - 6 mg/l	23 53 30
Chlorine free, combined, total	3/40E	0,02; 0,04 ; 0,06; 0,08; 0,1; 0,15; 0,2; 0,25; 0,3 mg/l	0.02 - 0.3 mg/l	23 40 60

including stirring rod



Test disc with colour stable glass standards

Certification for Comparator 2000+ Discs

To allow users to demonstrate that test equipment has been assessed for conformance with accepted quality standards, Lovibond® colour discs can be certified by the Tintometer® Group to conform to ISO 9001. If requested at the time of order, new discs are issued with a serial number and a certificate of conformance stating that the disc has satisfied the relevant inspection criteria and conforms to the requirements of the appropriate test. Depending on the requirements of the user's quality control system, used discs can be returned at regular intervals to the Tintometer® Group for checking and recertification.

Type of certificate	Code
Certificate for a new test disc	999800
Certificate for a used test disc	999810
Calibration certificate for a new test disc	999820
Calibration certificate for a used test disc	999830

Reagent	Quantity	Code	Accessories	Code
ALUMINIUM No.1	100	51 54 60 BT	13.5 mm cell, 10 ml	35 42 43
ALUMINIUM No.2	250	51 54 61 BT		
Combi pack#	100	51 54 70 BT		
ALUMINIUM No.1 / No.2	250	51 54 71 BT		
	each 100	51 76 01 BT		
	each 250	51 76 02 BT		
AMINE	100	51 10 10	Extraction tube AF260	35 26 00
	250	51 10 11		
Details on request			13.5 mm cell, 10 ml	35 42 43
AMMONIA No.1	100	51 25 80 BT	40 mm cell W680/40	60 68 90
AMMONIA No.2	250	51 25 81 BT		
Combi pack#	100	51 25 90 BT		
AMMONIA No.1 / No.2	250	51 25 91 BT		
	each 100	51 76 11 BT		
	each 250	51 76 12 BT		
AMMONIA No.1/2			13.5 mm cell, 10 ml	35 42 43
AMMONIA No.1/2			5 mm cell W680	60 67 90
NESSLER reagent	30 ml	46 52 00	Nessler-tubes 113 mm Nesselriser 2150	35 30 60
SEIGNETTE salt solution	100 ml	46 52 01		17 21 50
	100 ml	46 61 01		
NESSLER reagent			Nessler-tubes 113 mm Nesselriser 2150	35 30 60
SEIGNETTE salt solution				17 21 50
NESSLER reagent			Nessler-tubes 113 mm Nesselriser 2150	35 30 60
SEIGNETTE salt solution				17 21 50
NESSLER reagent			Nessler-tubes 113 mm Nesselriser 2150	35 30 60
SEIGNETTE salt solution				17 21 50
DPD No.1	100	51 10 50 BT	13.5 mm cell, 10 ml	35 42 43
	250	51 10 51 BT		
	500	51 10 52 BT		
DPD No.1			13.5 mm cell, 10 ml	35 42 43
DPD No.1			13.5 mm cell, 10 ml	35 42 43
DPD No.1	100	51 10 50 BT	40 mm cell W680/40	60 68 90
	250	51 10 51 BT		
	500	51 10 52 BT		
DPD No.2	100	51 15 30 BT		
	250	51 15 31 BT		
DPD No.3	100	51 10 80 BT		
	250	51 10 81 BT		
	500	51 10 82 BT		
Combi pack#	each 100	51 77 11 BT		
DPD No.1 / No.3	each 250	51 77 12 BT		
DPD No.4	100	51 12 20 BT		
	250	51 12 21 BT		
	500	51 12 22 BT		



Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	Code Colour disc
Chlorine free, combined, total		0,02; 0,04 ; 0,06; 0,08; 0,1; 0,2; 0,3; 0,4; 0,5 mg/l	0.02 - 0.5 mg/l	29 59 20
Chlorine free, combined, total	3/40F	0,2; 0,25 ; 0,3; 0,35; 0,4; 0,5; 0,6; 0,7; 0,8 mg/l	0.2 - 0.8 mg/l	23 40 70
Chlorine free, combined, total	3/40G	1,5; 1,8; 2,0; 2,3; 2,5; 2,7; 3,0; 3,2; 3,5 mg/l	1.5 - 3.5 mg/l	23 40 30
Chlorine free, combined, total	3/40A	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 - 1.0 mg/l	23 40 10
Chlorine free, combined, total	3/40T	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 - 1.0 mg/l	23 41 10
Chlorine free, combined, total	3/40N	1,1; 1,2; 1,3; 1,4; 1,5; 1,6; 1,7; 1,8; 2 mg/l	1.1 - 2.0 mg/l	23 39 60
Chlorine free, combined, total	3/40J	0,1; 0,2; 0,3; 0,4; 0,6; 0,8; 1; 1,5; 2 mg/l	0.1 - 2.0 mg/l	23 41 40
Chlorine free, combined, total	3/40B	0,2; 0,4; 0,6; 1; 1,5; 2; 2,5; 3; 4 mg/l	0.2 - 4.0 mg/l	23 40 20
Chlorine free, combined, total	3/40K	0,5; 1; 1,5; 2; 2,5; 3; 4; 5; 6 mg/l	0.5 - 6.0 mg/l	23 39 30
Chlorine free, combined, total	3/40S	1; 1,2; 1,4; 1,6; 1,8; 2; 2,5; 3; 4 mg/l	1.0 - 4.0 mg/l	23 40 90
Chlorine free, combined, total	3/40P	2; 2,3; 2,5; 2,7; 3; 3,2; 3,6; 4; 5 mg/l	2.0 - 5.0 mg/l	23 39 20
Chlorine free, combined, total	3/40HN	2; 3; 4; 5; 6; 7; 8; 9; 10 mg/l	2.0 - 10 mg/l	23 40 81
Chlorine free, combined, total	3/40CZ	0,5; 1; 1,5; 2; 4 mg/l Cl ₂ 7; 7,4; 7,6; 8 pH	0.5 - 4 mg/l Cl ₂ 7 - 8 pH	23 39 90
Chlorine free, combined, total	3/2A	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 - 1.0 mg/l	23 20 10
Chlorine free, combined, total	3/2AB	0,15; 0,25; 0,5; 0,75; 1; 1,25; 1,5; 1,75; 2 mg/l	0.15 - 2.0 mg/l	23 20 20
Chlorine free, combined, total	3/2APC	1; 1,5; 2; 2,5; 3; 3,5; 4; 4,5; 5 mg/l	1.0 - 5.0 mg/l	23 20 50
Chlorine HR total chlorine only	3/2APH	2; 3; 4; 5; 6; 7; 8; 9; 10 mg/l total Cl ₂	2 - 10 mg/l	23 20 60

including stirring rod

Reagent	Quantity	Code	Accessories	Code
DPD No. 1/2/3/4 			40 mm cell W680/40	60 68 90
DPD No. 1/2/3/4 			40 mm cell W680/40	60 68 90
DPD No. 1/2/3/4 			13.5 mm cell, 10 ml	35 42 43
DPD No. 1/2/3/4 			13.5 mm cell, 10 ml	35 42 43
DPD No. 1/2/3/4 			25 mm cell W680/25 13.5 mm cell, 10 ml	60 68 60 35 42 43
DPD No. 1/2/3/4 			25 mm cell W680/25 13.5 mm cell, 10 ml	60 68 60 35 42 43
DPD No. 1/2/3/4 			13.5 mm cell, 10 ml	35 42 43
DPD No. 1/2/3/4 			13.5 mm cell, 10 ml	35 42 43
DPD No. 1/2/3/4 			13.5 mm cell, 10 ml	35 42 43
DPD No. 1/2/3/4 			13.5 mm cell, 10 ml	35 42 43
DPD No. 1/2/3/4 			13.5 mm cell, 10 ml	35 42 43
DPD No. 1/2/3/4 			5 mm cell W680/5	60 67 90
DPD No. 1/2/3/4 Phenol red tablets, see pH determination			13.5 mm cell, 10 ml 13.5 mm cell, 10 ml	35 42 43 35 42 43
Reagents at specialized chemistry dealer			13.5 mm cell, 10 ml	35 42 43
Reagents at specialized chemistry dealer			13.5 mm cell, 10 ml	35 42 43
Reagents at specialized chemistry dealer			5 mm cell W680/5	60 67 90
CHLORINE HR (KI)	100	51 30 00 BT	40 mm cell W680/40	60 68 90
	250	51 30 01 BT		
ACIDIFYING GP	100	51 54 80 BT		
	250	51 54 81 BT		
Combi pack#	each 100	51 77 21 BT		
CHLORINE HR (KI)/ ACIDIFYING GP	each 250	51 77 22 BT		



Lighting unit, mains operated

Material Safety Data Sheets: www.lovibond.com Green Chemistry



Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	Code Colour disc
Chlorine HR total chlorine only	3/2ARP	5; 10; 15; 20; 25; 30; 35; 40; 50 mg/l total Cl ₂	5.0 - 50 mg/l	23 20 70
Chlorine HR total chlorine only	3/2IOD	5; 10; 25; 50; 75; 100; 150; 200; 250 mg/l total Cl ₂	5.0 - 250 mg/l	23 20 90
Chlorine free, combined, total	NDPB	0,01; 0,02; 0,03; 0,04; 0,05; 0,06; 0,07; 0,08; 0,1 mg/l	0.01 - 0.1 mg/l	28 34 50
Chlorine free, combined, total	NDPC	0,02; 0,04; 0,06; 0,08; 0,1; 0,12; 0,14; 0,16; 0,2 mg/l	0.02 - 0.2 mg/l	28 34 60
Chlorine free, combined, total	NDP	0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,35; 0,4; 0,5 mg/l	0.05 - 0.5 mg/l	28 34 40
Chlorine free, combined, total	NDPD	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 - 1.0 mg/l	28 34 70
Chlorine dioxide	3/40AD	0,19; 0,38; 0,57; 0,76; 0,95; 1,14; 1,33; 1,52; 1,9 mg/l	0.19 - 1.9 mg/l	29 22 60
Chlorine dioxide	3/40ED	0,04; 0,08; 0,11; 0,15; 0,19; 0,28; 0,38; 0,48; 0,57 mg/l	0.04 - 0.57 mg/l	29 79 70
Chlorine dioxide	3/40FD	0,38; 0,48; 0,57; 0,66; 0,76; 0,95; 1,14; 1,33; 1,52 mg/l	0.38 - 1.52 mg/l	29 87 50
Chlorine dioxide	3/157	0,25; 0,5; 0,75; 1; 1,25; 1,5; 2; 3; 5 mg/l	0.25 - 5.0 mg/l	23 05 70
Chromium	3/59	10; 20; 30; 40; 50; 60; 70; 80; 100 µg (25 ml probe)	0.4 - 4 mg/l	23 59 00
Copper	3/106	0; 0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,8; 1 mg/l	0 - 1.0 mg/l	23 00 50
Copper	3/110	0; 0,5; 1; 1,5; 2; 2,5; 3; 3,5; 4 mg/l	0 - 4.0 mg/l	23 00 40
DEHA	3/150	8; 16; 24; 32; 40; 48; 56; 64; 80 µg/l Disc reading should be multiplied by 2 for true DEHA concentration	16 - 160 µg/l	23 04 60
Fluoride	NOM	0; 0,2; 0,4; 0,6; 0,8; 1; 1,2; 1,4; 1,6 mg/l	0 - 1.6 mg/l	28 37 30

including stirring rod

Reagent	Quantity	Code	Accessories	Code
CHLORINE HR (KI) ACIDIFYING GP			13.5 mm cell, 10 ml	35 42 43
CHLORINE HR (KI) ACIDIFYING GP			13.5 mm cell, 10 ml	35 42 43
DPD No.1 NESSLERISER 	100	51 12 30 BT	Nessleriser 2150	17 21 50
	250	51 12 31 BT	Nessler-tubes 113 mm	35 30 60
DPD No.2 NESSLERISER 	100	51 12 40		
	250	51 12 41		
DPD No.3 NESSLERISER 	100	51 12 50 BT		
	250	51 12 51 BT		
DPD No.4 NESSLERISER 	100	51 12 60 BT		
	250	51 12 61 BT		
DPD No.1/2/3/4  NESSLERISER			Nessleriser 2150 Nessler-tubes 113 mm	17 21 50 35 30 60
DPD No.1/2/3/4  NESSLERISER			Nessleriser 2150 Nessler-tubes 113 mm	17 21 50 35 30 60
DPD No.1/2/3/4  NESSLERISER			Nessleriser 2150 Nessler-tubes 113 mm	17 21 50 35 30 60
DPD No.1 	100	51 10 50 BT	13.5 mm cell, 10 ml	35 42 43
	250	51 10 51 BT		
DPD No.1 			40 mm cell W680/40	60 68 90
DPD No.1 			40 mm cell W680/40	60 68 90
CHLORINE HR (KI)	100	51 30 00 BT	40 mm cell W680/40	60 68 90
	250	51 30 01 BT		
ACIDIFYING GP	100	51 54 80 BT		
	250	51 54 81 BT		
Combi pack [#]	each 100	51 77 21 BT		
CHLORINE HR (KI)/ ACIDIFYING GP	each 250	51 77 22 BT		
Details on request			13.5 mm cell, 10 ml	35 42 43
COPPER/ZINC LR	100	51 26 20 BT	13.5 mm cell, 10 ml	35 42 43
	250	51 26 21 BT		
COPPER/ZINC HR	100	51 23 40 BT	13.5 mm cell, 10 ml	35 42 43
	250	51 23 41 BT		
DEHA	100	51 32 20 BT	40 mm cell W680/40	60 68 90
	250	51 32 21 BT		
DEHA solution	100 ml	46 11 81		
FLUORIDE A-Z	100	51 14 00 BT	Nessleriser 2150	17 21 50
FLUORIDE EXCESS AL	100	51 14 10	Nessler-tubes 113 mm	35 30 60
	250	51 14 11		



Nessleriser with lighting unit

Material Safety Data Sheets: www.lovibond.com Green Chemistry



Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	Code Colour disc
Iron, total	3/144	0,02; 0,04; 0,06; 0,08; 0,1; 0,15; 0,2; 0,25; 0,3 mg/l	0.02 - 0.3 mg/l	23 03 80
Iron, total	3/116	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 - 1.0 mg/l	23 01 00
Iron, total	3/117	1; 2; 3; 4; 5; 6; 7; 8; 10 mg/l	1.0 - 10 mg/l	23 01 10
Iron, total	NOL	0,01; 0,02; 0,03; 0,04; 0,05; 0,06; 0,07; 0,08; 0,10 mg/l	0.01 - 0.1 mg/l	28 37 20
Hardness, total	4/38	0; 5; 10; 15; 20; 25; 30; 40; 60 mg/l	0 - 60 mg/l CaCO ₃	23 10 70
Hazen/APHA	4/28	50; 75; 100; 150; 200; 250; 300; 400; 500 mg Pt/l	50 - 500 mg/l Pt	24 28 01
Hazen/APHA	NSH	10; 20; 30; 40; 50; 60; 70; 80; 90 mg Pt/l	10 - 90 mg/l Pt	28 41 70
Hazen/APHA	NSB	70; 85; 100; 125; 150; 175; 200; 225; 250 mg Pt/l	70 - 250 mg/l Pt	28 41 20
Hazen/APHA	CAA	0; 2,5; 5; 7,5; 10; 15; 20; 25; 30 mg Pt/l	0 - 30 mg/l Pt	28 41 50
Hazen/APHA	CAB	30; 35; 40; 45; 50; 55; 60; 65; 70 mg Pt/l	30 - 70 mg/l Pt	28 41 60
Hydrazine	3/126	0; 0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,4; 0,5 mg/l	0 - 0.5 mg/l	23 01 90
Hydrazine	3/135	0,02; 0,04; 0,06; 0,08; 0,1; 0,12; 0,14; 0,16; 0,2 mg/l	0.02 - 0.2 mg/l	23 02 90
Hydrazine	3/85	0; 0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,8; 1 mg/l	0 - 1.0 mg/l	23 85 00
Hydrazine	NOH	0; 0,5; 1; 2; 3; 4; 6; 8; 10 µg (25 ml Probe)	0 - 0.4 mg/l	28 37 00
Hydrogen peroxide	3/50 A	0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,35; 0,4; 0,5 mg/l	0.05 - 0.5 mg/l	23 50 00
Hydrogen peroxide	3/50 B	0,1; 0,2; 0,3; 0,4; 0,6; 1; 1,5; 2; 3 mg/l	0.1 - 3 mg/l	23 50 10
Hydrogen peroxide	3/50 E	0,01; 0,02; 0,03; 0,04; 0,05; 0,07; 0,09; 0,12; 0,15 mg/l	0.01 - 0.15 mg/l	23 50 20
Iodine	3/77A	0,4; 0,7; 1,1; 1,4; 1,8; 2,2; 2,5; 2,9; 3,6 mg/l	0.4 - 3.6 mg/l	23 77 10
Iodine	3/77B	0,7; 1,4; 2,2; 3,6; 5,4; 7,2; 9,0; 11; 14 mg/l	0.7 - 14 mg/l	23 77 20
Manganese	3/169	0; 0,5; 1; 1,5; 2; 2,5; 3; 3,5; 4 mg/l	0 - 4.0 mg/l	23 06 90

including stirring rod

Reagent	Quantity	Code	Accessories	Code
IRON LR (Fe^{2+} und Fe^{3+})	100 250	51 53 70 BT 51 53 71 BT	40 mm cell W680/40	60 68 90
IRON LR (Fe^{2+} und Fe^{3+})	100 250	51 53 70 BT 51 53 71 BT	13.5 mm cell, 10 ml	35 42 43
IRON (II) LR (Fe^{2+})	100	51 54 20 BT		
IRON HR	100 250	51 53 80 BT 51 53 81 BT	13.5 mm cell, 10 ml	35 42 43
IRON LR + IRON (II) LR			Nessleriser 2150 Nessler-tubes 113 mm	17 21 50 35 30 60
ERIOCHROME HARDNESS powder	100 Tests	46 29 50	13.5 mm cell, 10 ml	35 42 43
Straight colour match to sample			40 mm cell W680/40	60 68 90
Straight colour match to sample			Nessleriser 2150 Nessler-tubes 113 mm	17 21 50 35 30 60
Straight colour match to sample			Nessleriser 2150 Nessler-tubes 113 mm	17 21 50 35 30 60 without lid 35 30 80 with lid
Straight colour match to sample			Nessleriser 2250 Nessler-tubes 250 mm	17 22 50 35 42 00
Straight colour match to sample			Nessleriser 2250 Nessler-tubes 250 mm	17 22 50 35 42 00
HYDRAZINE TEST-powder	30 g	46 29 10	13.5 mm cell, 10 ml	35 42 43
HYDRAZINE TEST-powder	30 g	46 29 10	40 mm cell W680/40	60 68 90
p-DMAB reagent	100 ml	46 12 61	13.5 mm cell, 10 ml	35 42 43
p-DMAB reagent	100 ml	46 12 61	Nessler-tubes 113 mm	35 30 60
HYDR. PEROXIDE LR	100 250	51 23 80 BT 51 23 81 BT	13.5 mm cell, 10 ml	35 42 43
HYDR. PEROXIDE LR			13.5 mm cell, 10 ml	35 42 43
HYDR. PEROXIDE LR			40 mm cell W680/40	60 68 90
DPD No.1 	100 250	51 10 50 BT 51 10 51 BT	13.5 mm cell, 10 ml	35 42 43
DPD No.1 			13.5 mm cell, 10 ml	35 42 43
MANGANESE LR 1	100 250	51 60 80 BT 51 60 81 BT	13.5 mm cell, 10 ml	35 42 43
MANGANESE LR 2	100 250	51 60 90 BT 51 60 91 BT		
Combi pack#	each 100	51 76 21 BT		
MANGANESE LR 1/ MANGANESE LR 2	each 250	51 76 22 BT		



Lighting unit with comparator and discs,
mains operated



Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	Code Colour disc
Molybdate	3/162	0; 1; 2; 3; 4; 5; 6; 8; 10 mg/l	0 -10 mg/l MoO ₄	23 06 20
Molybdate	3/137	5; 10; 15; 20; 25; 30; 35; 40; 50 mg/l	5.0 -50 mg/l MoO ₄	23 03 20
Molybdate	3/138	10; 20; 30; 40; 60; 80; 100; 120; 150 mg/l	10 -150 mg/l MoO ₄	23 03 30
Sodiumhypochlorite	3/2 Hypo	2; 4; 6; 8; 10; 12; 14; 16 %	2 - 16 %	23 21 10
Nitrate	3/124	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 -1.0 mg/l N	23 01 70
Nitrate	3/142	10; 20; 30; 40; 50; 60; 70; 80; 100 mg/l	10 -100 mg/l NO ₃	23 03 60
Nitrite	3/103	0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,35; 0,4; 0,5 mg/l	0.05 - 0.5 mg/l N	23 00 30
Nitrite	NJP	0,002; 0,004; 0,006; 0,01; 0,015; 0,02; 0,03; 0,04; 0,05 mg/l	0.002 - 0.05 mg/l N	28 39 60
Nitrite	NJ	0,05; 0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,8; 1 µg/l (50 ml probe)	0.001 - 0.02 mg/l N	28 35 80
Oxygen	3/165	2; 3; 4; 5; 6; 7; 8; 10; 12 mg/l	2.0 - 12 mg/l	23 06 50
Ozone	3/67	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 - 1.0 mg/l	23 67 00
Ozone	3/67A	0,01; 0,02; 0,03; 0,04; 0,05; 0,06; 0,07; 0,08; 0,1 mg/l	0.01 - 0.1 mg/l	23 67 10
Ozone	3/67S	0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,35; 0,4; 0,45 mg/l	0.05 - 0.45 mg/l	23 67 70

including stirring rod

Reagent	Quantity	Code	Accessories	Code
Details on request			40 mm cell W680/40	60 68 90
MOLYBDATE No.1 HR	100	51 30 60 BT	40 mm cell W680/40	60 68 90
	250	51 30 61 BT		
MOLYBDATE No.2 HR	100	51 30 70 BT		
	250	51 30 71 BT		
Combi pack#	each 100	51 76 31 BT		
MOLYBDATE No.1 HR / MOLYBDATE No.2 HR	each 250	51 76 32 BT		
MOLYBDATE No.1 HR MOLYBDATE No.2 HR			13.5 mm cell, 10 ml	35 42 43
CHLORINE HR (KI)	100	51 30 00 BT	13.5 mm cell, 10 ml	35 42 43
	250	51 30 01 BT		
ACIDIFYING GP	100	51 54 80 BT		
	250	51 54 81 BT		
Combi pack#	each 100	51 77 21 BT		
CHLORINE HR (KI)	each 250	51 77 22 BT		
ACIDIFYING GP				
Dilution set for sample preparation	1	41 44 70		
NITRATE-TEST tablets	100	50 28 10	13.5 mm cell, 10 ml	35 42 43
NITRATE Test powder	(bottle)	46 52 30	Nitrate-Test-tubes	36 62 20
NITRITE LR	15 g	51 23 10BT		
	100	51 23 11BT		
	250			
NITRATE No.1	100	51 31 10	13.5 mm cell, 10 ml	35 42 43
NITRATE No.2	100	51 31 20		
	250	51 31 21		
Combi pack#	each 100	51 76 41		
Nitrate No.1 / No.2	each 250	51 76 42		
NITRITE LR	100	51 23 10BT	13.5 mm cell, 10 ml	35 42 43
	250	51 23 11BT		
NITRITE LR	100	51 23 10BT	Nessler-tubes 113 mm	35 30 60
	250	51 23 11BT		
NITRITE ACIDIFYING	250 (Flasche)	50 23 71		
Details on request			Nessler-tubes 113 mm	35 30 60
DO-reagent No.1	100 Tests	46 11 50	13.5 mm cell, 10 ml	35 42 43
DO-reagent No.2	100 Tests	46 11 60		
DO-reagent No.3	90 Tests	46 11 70		
DPD No.4 	100	51 12 20 BT	13.5 mm cell, 10 ml	35 42 43
	250	51 12 21 BT		
DPD No.4 	100	51 12 20 BT	40 mm cell W680/40	60 68 90
	250	51 12 21 BT		
DPD No.4 	100	51 12 20 BT	13.5 mm cell, 10 ml	35 42 43
	250	51 12 21 BT		



Lighting unit TK 102

Material Safety Data Sheets: www.lovibond.com Green Chemistry



Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	Code Colour disc
Ozone	3/148	0; 0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,4; 0,5 mg/l	0 - 0.5 mg/l	23 04 40
pH	2/1A	1,2; 1,4; 1,6; 1,8; 2,0; 2,2; 2,4; 2,6; 2,8	1.2 - 2.8 pH	22 10 10
pH	2/1B	2,8; 3; 3,2; 3,4; 3,6; 3,8; 4; 4,2; 4,4	2.8 - 4.4 pH	22 10 30
pH	2/1C	3,6; 3,8; 4; 4,2; 4,4; 4,6; 4,8; 5; 5,2	3.6 - 5.2 pH	22 10 50
pH	2/1E	4,4; 4,6; 4,8; 5; 5,2; 5,4; 5,6; 5,8; 6	4.4 - 6.0 pH	22 10 80
pH	2/1G	5,2; 5,4; 5,6; 5,8; 6; 6,2; 6,4; 6,6; 6,8	5.2 - 6.8 pH	22 11 00
pH	2/1H	6; 6,2; 6,4; 6,6; 6,8; 7; 7,2; 7,4; 7,6	6.0 - 7.6 pH	22 11 10
pH	2/1J	6,8; 7; 7,2; 7,4; 7,6; 7,8; 8; 8,2; 8,4	6.8 - 8.4 pH	22 11 30
pH	2/1K	7,2; 7,4; 7,6; 7,8; 8; 8,2; 8,4; 8,6; 8,8	7.2 - 8.8 pH	22 11 40
pH	2/1L	8; 8,2; 8,4; 8,6; 8,8; 9; 9,2; 9,4; 9,6	8.0 - 9.6 pH	22 11 90
pH	2/1P	4; 5; 6; 7; 8; 9; 9,4; 10; 11	4.0 - 11 pH	22 12 20
pH	2/1W	1,0; 1,2; 1,4; 1,6; 1,8; 2,0; 2,2; 2,4; 2,6	1.0 - 2.6 pH	22 12 50
pH	2/1Z	7,6; 7,8; 8; 8,2; 8,4; 8,6; 8,8; 9,0; 9,2	7.6 - 9.2 pH	22 12 70
pH	NLC	6; 6,2; 6,4; 6,6; 6,8; 7; 7,2; 7,4; 7,6	6.0 - 7.6 pH	28 10 30
pH	NLF	8; 8,2; 8,4; 8,6; 8,8; 9; 9,2; 9,4; 9,6	8.0 - 9.6 pH	28 10 60
Phosphate	3/133	0; 0,25; 0,5; 1; 1,5; 2; 2,5; 3; 4 mg/l	0 - 4.0 mg/l PO ₄	23 02 70

including stirring rod

Reagent	Quantity	Code	Accessories	Code
OZONE-INDIGO	100 250	51 31 70 BT 51 31 71 BT	40 mm cell W680/40	60 68 90
THYMOL BLUE	100 250	51 16 50 51 16 51	13.5 mm cell, 10 ml	35 42 43
BROMOPHENOL BLUE	100 250	51 16 20 51 16 21	13.5 mm cell, 10 ml	35 42 43
BROMOCRESOL GREEN	100 250	51 17 60 51 17 61	13.5 mm cell, 10 ml	35 42 43
METHYL RED	100 ml	45 16 31	13.5 mm cell, 10 ml	35 42 43
BROMOCRESOL PURPLE	100 250	51 17 30 51 17 31	13.5 mm cell, 10 ml	35 42 43
BROMOTHYMOL BLUE	100 250	51 16 40 BT 51 16 41 BT	13.5 mm cell, 10 ml	35 42 43
PHENOL RED 	100 250	51 17 50 BT 51 17 51 BT	13.5 mm cell, 10 ml	35 42 43
CRESOL RED	100 250	51 16 00 51 16 01	13.5 mm cell, 10 ml	35 42 43
THYMOL BLUE	100 250	51 16 50 51 16 51	13.5 mm cell, 10 ml	35 42 43
UNIVERSAL PH Indicator	25 ml 100 ml 250 ml 500 ml	45 17 70 45 17 71 45 17 72 45 17 73	13.5 mm cell, 10 ml	35 42 43
M-CRESOL PURPLE	100 250	51 17 10 BT 51 17 11 BT	13.5 mm cell, 10 ml	35 42 43
M-CRESOL PURPLE	100 250	51 17 10 BT 51 17 11 BT	13.5 mm cell, 10 ml	35 42 43
BROMOTHYMOL BLUE PH Indicator	25 ml 100 ml 250 ml 500 ml	45 16 20 45 16 21 45 16 22 45 16 23	Nessler-tubes 113 mm	35 30 60
THYMOL BLUE PH Indicator	25 ml 100 ml 250 ml 500 ml	45 16 50 45 16 51 45 16 52 45 16 53	Nessler-tubes 113 mm	35 30 60
PHOSPHATE No.1 LR	100	51 30 40 BT	13.5 mm cell, 10 ml	35 42 43
PHOSPHATE No.2 LR	100	51 30 50 BT		
Combi pack#	each 100	51 76 51 BT		
PHOSPHATE No.1 LR / No.2 LR				



Tablet reagents in foil blister strip (BT)



Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	Code Colour disc
Phosphate	3/136	0; 5; 10; 15; 20; 25; 30; 35; 40 mg/l	0 - 40 mg/l PO ₄	23 03 10
Phosphate	3/12	0; 10; 20; 30; 40; 50; 60; 70; 80 mg/l	0 - 80 mg/l PO ₄	23 12 00
Phosphate	3/70	0; 10; 20; 30; 40; 50; 60; 70; 80; 100 mg/l	0 - 100 mg/l PO ₄	23 70 00
Phosphate	3/60	10; 20; 30; 40; 50; 60; 70; 80; 100 mg/l	10 - 100 mg/l PO ₄	23 60 00
Phosphate	NMD	10; 20; 30; 40; 50; 60; 70; 80; 100 µg/l (50 ml probe)	0.2 - 2 mg/l PO ₄	28 39 50
QAC (Quaternary Ammonia Compounds)	3/118	0; 2; 4; 6; 8; 10; 12; 15; 20 mg/l	0 - 20 mg/l	23 01 20
QAC (Quaternary Ammonia Compounds)	3/119	0; 20; 40; 60; 80; 100; 120; 150; 200 mg/l	0 - 200 mg/l	23 01 30
Silica	3/139	0,4; 0,6; 1; 1,5; 2; 2,5; 3; 3,5; 4 mg/l	0.4 - 4.0 mg/l SiO ₂	23 03 40
Silica	3/147	1; 2; 3; 4; 5; 6; 7; 8; 10 mg/l	1.0 - 10 mg/l SiO ₂	23 04 20
Silica	3/140	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1,0 mg/l	0.1 - 1.0 mg/l SiO ₂	23 02 50
Silica	3/13	2,5; 5; 7,5; 10; 12,5; 15; 17,5; 20; 25 mg/l	2.5 - 25 mg/l SiO ₂	23 13 00
Silica	NN	1; 2; 4; 6; 8; 10; 12; 16; 20 mg/l	1.0 - 20 mg/l SiO ₂	28 36 30
Silica	NV	0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 0,9; 1,0 mg/l	0.2 - 1.0 mg/l SiO ₂	28 38 80
Sugar	3/29A	0; 5; 10; 15; 30; 45; 60; 75; 100 mg/l	0 - 100 mg/l	23 29 10
Sulphide	3/128	0; 0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,4; 0,5 mg/l	0 - 0.5 mg/l S	23 02 10
Zinc	3/151	0; 0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,8; 1 mg/l	0 - 1.0 mg/l	23 04 70
Zinc	3/102	0; 0,5; 1; 1,5; 2; 2,5; 3; 3,5; 4 mg/l	0 - 4.0 mg/l	23 00 20

including stirring rod

Reagent	Quantity	Code	Accessories	Code
PHOSPHATE HR	100 250	51 19 80 BT 51 19 81 BT	13.5 mm cell, 10 ml	35 42 43
Details on request			13.5 mm cell, 10 ml	35 42 43
PHOSPHATE HR	100	51 19 80 BT	13.5 mm cell, 10 ml	35 42 43
Vanadomolybdat-Reagent	1 litre	46 84 04	13.5 mm cell, 10 ml	35 42 43
Details on request			Nessler-tubes 113 mm	35 30 60
QAC LR	100 250	51 53 90 BT 51 53 91 BT	40 mm cell W680/40	60 68 90
ACIDIFYING GP	100 250	51 54 80 BT 51 54 81 BT		
QAC HR	100 250	51 54 00 51 54 01	13.5 mm cell, 10 ml	35 42 43
ACIDIFYING GP	100 250	51 54 80 BT 51 54 81 BT		
SILICA No.1	100 250	51 31 30 BT 51 31 31 BT	13.5 mm cell, 10 ml	35 42 43
SILICA No.2	100 250	51 31 40 BT 51 31 41 BT		
Combi pack#	each 100	51 76 71 BT		
SILICA No.1 / No.2	each 200	51 76 72 BT		
SILICA No.1/No.2			13.5 mm cell, 10 ml	35 42 43
Details on request			40 mm cell W680/40	60 68 90
Ammonia-molybdate	100 ml	46 02 41	40 mm cell W680/40	60 68 90
Ammonia-molybdate	100 ml	46 02 41	Nessleriser 215 Nessler-tubes 113 mm	17 21 50 35 30 60
Details on request			Nessler-tubes 113 mm	35 30 60
Details on request			5 mm cell W680/5	60 67 90
SULPHIDE No.1	100 (bottle)	50 29 30 50 29 40	13.5 mm cell, 10 ml	35 42 43
SULPHIDE No.2	100 (bottle)			
COPPER/ZINC LR	100	51 26 20 BT	13.5 mm cell, 10 ml	35 42 43
COPPER/ZINC LR	250	51 26 21 BT		
COPPER/ZINC HR	100	51 23 40 BT	13.5 mm cell, 10 ml	35 42 43
COPPER/ZINC HR	250	51 23 41 BT		



Test disc with colour-stable glass standards



Colour measurement of water

E-Comparator EC 2000 Pt-Co



The evolution of the visual (subjective) for electronic (objective) colour measurement of water

The Lovibond® EComparator Pt-Co provides an easy way to replace the subjective visual colour comparison with an objective and accurate electronic measurement, without sacrificing the visual assessment of the colour view.

The user friendly ergonomics and intuitive interface guarantee new users can be quickly trained and easily supported. Large data storage (> 20,000 readings) and USB connectivity ensures readings can be stored and shared easily and

quickly. Flexibility is further enhanced with software packages for **Windows® with multiple language* support on-screen.

Touch screen technology makes the EComparator Series easily programmable with instinctive menus on screen. Users can set language*, date and time, view preferences and create projects with individual tolerance settings.

An on-screen warning system of:

Green = Within Tolerance;

Red = Outside Tolerance;

Amber = On Border of Tolerance

provides the user with immediate information on the sample.

* Supported Languages: English, French, German, Spanish, Italian, Chinese, Japanese, Russian

** Applicable for the following operating systems: Windows XP, Windows Vista and Windows 7/10

✓ Colour measurement of water

✓ according to international standards such as:
Platinum-Cobalt / Hazen / APHA / ASTM D 1209 / TCU

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

Often referred to as Pt-Co, Platinum-Cobalt, Hazen or APHA Colour – all terms are interchangeable and equally valid.

Used to measure clear to dark amber liquids.

Originally defined by specified dilutions: range from 0 at the light end of the scale to 500 at the darkest.

Used extensively in the water industry but also for clear oils, chemicals and petrochemicals such as glycerine, plasticisers, solvents, carbon tetrachloride and petroleum spirits.

Accuracy and Efficiency

The EComparator Pt-Co are supplied with a Certified and Liquid Reference Standard enabling quick and simple validation.

The instrument is equipped with an integrated light shield to protect the sample from ambient light and a flexible path length and cell choice (plastic or glass) for flexibility of application.

With robust casing and a small laboratory footprint, the EComparator Series is the ideal solution for users wishing to experience the benefits of immediate, accurate, electronic readings: the best of both worlds.

Technical Data

Light Source	White LED (25 year lifetime)
Sensors	Tristimulus Detectors, Reference and Sample
Colour	Scale Pt-Co
Range	2 - 500
Resolution	1 Pt-Co Unit
Repeatability	+/- 3% +1 Pt-Co Units
Path Length	50mm
Standards	ASTM D1209
Comparator View	2 Field

Display	Size: 3.5 inch Resolution: 320x240 Colour: 24 Bit (True Colour)
Touchscreen	Resistive
Keypad	3 key tactile membrane
Sample Chamber	W100 Spectrophotometer
Cell Type Filters	EC Range Holders
Filter	Glass standard for E-Comparator
Casing	Flame Retardant ABS

Material Size (mm)	W 106 x D 210 x H 57
Power Sources Batteries	USB or Battery 4 x AA
Data Storage	> 20,000 readings
Interface	USB 2.0 A- Micro B plug
Software	Data Transmission Software for **Windows
Temperature	Max Sample Temperature = 80 °C

Accessories

			Code
Liquid Standard Zero	EC 2000	500 ml	133991
Liquid Reference Standard ASTM Value 1	LIQUID REF STD		134000
Liquid Reference Standard ASTM Value 3	LIQUID REF STD		134010
Liquid Reference Standard ASTM Value 5	LIQUID REF STD		134020
Liquid Reference Standard Pt-Co 5	EC 2000	500 ml	134140
Liquid Reference Standard Pt-Co 10	EC 2000	500 ml	134150
Liquid Reference Standard Pt-Co 15	EC 2000	500 ml	134160
Liquid Reference Standard Pt-Co 30	EC 2000	500 ml	134170
Liquid Reference Standard Pt-Co 50	EC 2000	500 ml	134180
Liquid Reference Standard Pt-Co 100	EC 2000	500 ml	134190
Liquid Reference Standard ASTM 0.4 (<0.5)	LIQUID REF STD		134290
Liquid Standard (15 ± 2.0)	EC 2000	for EC 2000 PT-CO - 60 ml	135049
Liquid Standard Zero	EC 2000	for EC 2000 PT-CO - 60 ml	135059
Glass Standard conformity filter			13 51 19
W 100 50 mm tube (plastic), tube Set 50			35 21 01
W 100. OG. 50 mm, 1 tube (optical glass)			60 10 70
USB adapter			19 06 20
USB cable, 2.0 A- Micro B plug for data transfer			19 06 30

**Applicable for the following operating systems: Windows XP, Windows Vista and Windows 7/10



Due to aesthetic considerations, the colouring of drinking water should not be strong or even visible. In many countries the colouring of drinking water is therefore determined by "True Colour Units", TCU for short, which correspond in numerical value to Hazen units. For this reason, the EC2000 Comparator is also available in a version for displaying the values in TCU units.

Code EC-TCU Kit: 162011

Code EC-TCU Instrument: 162007

Delivery Content

- EC 2000-Pt-Co in carrying case
- Power Supply (UK, EU, US Plug)
- USB Cable
- Screwdriver
- 4x AA Batteries
- Liquid Reference Standard 1
- 3 x 50mm W100 (Plastic cell)
- 1 x 50mm W100 (Optical Glass cell)
- Glass Standard
- CD with Software (Windows) and Manual

Code 16 20 10

Photometry





MD 100 / 110 / 200
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COD Setups
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MD 600 / 610
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MD 640
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SpectroDirect
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XD 7000 / 7500
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Photometry

History

More than three decades have passed since the appearance of the first photometer system.

Since that time, Tintometer has become a world-famous name as the manufacturer of photometer systems sold under the brand name of Lovibond®.

Our range of photometer systems extends from the **MD 100*** and **MD 110*** as hand-held models, the multi parameter **MD 200*** as desktop model to the **SpectroDirect** spectrophotometer for laboratories to the spectrophotometer **UV / VIS XD 7500**.

The new **XD 7000** (VIS) and **XD 7500** (UV/VIS) spectrophotometers include all available Lovibond® methods and give the professional user a wide range of options in all areas of water analysis. These instruments also apply to special implementations and demanding applications in research and development, as well as everyday routine lab work.

The multi-functional **PM 6x0** photometer provides the answer to all requirements relating to the analysis of water used in modern swimming pools. They offer a wide variety of pre-programmed methods and are therefore suitable for the demands of modern water analysis.

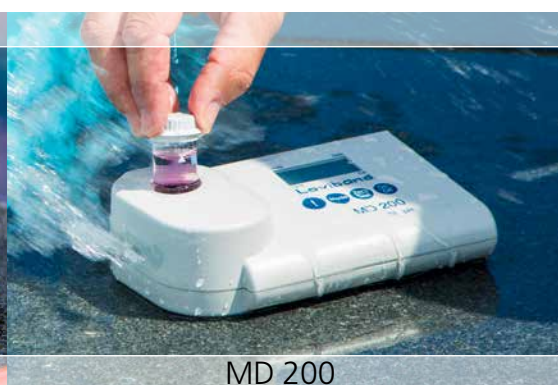
The **MultiDirect** offers a wide variety of pre-programmed methods and is therefore suitable for the demands of modern water and drinking water analysis.

Representing particularly robust, portable photometers for fast, flexible on-site analysis are the two **MD 600** and **MD 610** instruments. Additionally, the enhanced MD 640 is optimally suited for tracer measurements in closed water treatment water systems with the added parameters for fluorescein and PTSA.

The **MD 110**, **PM 630**, the **MD 610** and the **MD 640** are equipped with state-of-the-art data transmission and feature a **Bluetooth®** interface. Together with the free app AqualX® or the separately offered Bluetooth® dongle (for PC), data exchange is fast and wireless.

Parameter	MD 100* & MD 110*	MD 200*	MD 600 & MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Reagents also compatible to Hach® instruments*
Acid Capacity K _{S4.3}	■	■	■	■	■	■	■	■	■	
Alkalinity-m	■	■	■	■	■	■	■	■	■	
Alkalinity-p			■	■			■	■	■	
Aluminium	■		■	■			■	■	■	s. page 114
Ammonia	■		■	■			■	■	■	s. page 114
Arsenic							■	■	■	
Boron			■	■			■	■	■	
Bromine	■	■	■	■	■	■	■	■	■	s. page 114
Cadmium							■	■	■	
Calcium Hardness	■	■	■	■	■	■	■	■	■	
Chloride	■		■	■			■	■	■	
Chlorine	■	■	■	■	■	■	■	■	■	s. page 114
Chlorine Dioxid	■	■	■	■	■	■	■	■	■	s. page 114
Chromium			■	■			■	■	■	
COD	■	■	■	■			■	■	■	s. page 114
Copper	■	■	■	■	■	■	■	■	■	s. page 114
Cyanide			■	■			■	■	■	
Cyanuric Acid	■	■	■	■	■	■	■	■	■	
DEHA	■		■	■			■	■	■	s. page 116
Fluoresceine (only MD 640)			■							
Fluoride	■		■	■			■	■	■	
Formaldehyde							■	■	■	
Hazen (Pt-Co-Units ; APHA)	■		■	■			■	■	■	
Hydrazine	■		■	■			■	■	■	s. page 116
Hydrogen Peroxide	■	■	■	■			■	■	■	
Iodine			■	■	■	■	■	■	■	
Iron (Fe ²⁺ , Fe ³⁺), soluble	■	■	■	■	■	■	■	■	■	s. page 116
Langelier Water Balance System		■	■	■	■					
Lead							■	■	■	
Manganese	■		■	■			■	■	■	s. page 116
Molybdate / Molybdenum	■		■	■			■	■	■	s. page 116
Nickel			■	■			■	■	■	
Nitrate			■	■			■	■	■	s. page 116
Nitrite			■	■			■	■	■	s. page 116

* The photometer series MD 100, MD 110 and MD 200 does not contain all the mentioned parameters in one instrument. Number and type of parameters are version dependent (see corresponding chapter).

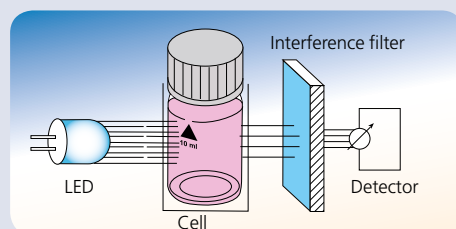


* HACH® is a registered trademark of Hach Company, Loveland, Colorado. The use of the HACH® trademark does not imply any affiliation with or approval by Hach Company regarding the formulation, testing or compatibility of these products for use in HACH® brand spectrophotometers or other instruments or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

The principle of photometry

When specific reagents are added, the water sample takes on a degree of coloration that is proportional to the concentration of the parameter being measured. The photometer measures this coloration.

When a light beam passes through the coloured sample, energy with a specific wavelength is absorbed by the test substance. The photometer determines the coloration of the sample by measuring the transmission or absorption of light of this wavelength (in other words, monochromatic light). High-quality interference filters precisely limit the wavelength and are a prerequisite for obtaining high precision measurement results. The use of such interference filters is one Lovibond® filter photometers to the quality standard. The photometer digitally calculates the required concentration and displays the result.



Parameter	MD 100* & MD 110*	MD 200*	MD 600 & MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Reagents also compatible to Hach® instruments*
Oxygen, active			■	■	■			■	■	
Oxygen, dissolved	■		■	■				■	■	
Ozone	■	■	■	■	■		■	■	■	
pH-Value	■	■	■	■	■		■	■	■	
Phenole							■	■	■	
PHMB (Biguanide)			■	■	■		■	■		
Phosphate	■		■	■	■		■	■	■	s. page 118
Phosphonate		■	■		■		■	■	■	s. page 118
Polyacrylates	■							■	■	
Potassium			■	■			■	■	■	
PTSA (only MD 640)			■							
Silica	■		■	■			■	■	■	s. page 118
Sodiumhypochlorite		■	■	■	■			■	■	
Spectral Absorption Coefficient (436 nm/525 nm/620 nm)					■		■	■		
Spectral Absorption- Coefficient (254 nm)									■	
Sulphate	■		■	■	■		■	■	■	s. page 118
Sulphide			■	■			■	■	■	
Sulphite			■	■			■	■	■	
Surfactants (anionic, cationic, non ionic)			■	■			■	■	■	
Suspended Solids	■		■	■			■	■	■	
TOC			■	■			■	■	■	
Total Hardness	■		■	■	■		■	■	■	
Total Nitrogen			■	■			■	■	■	s. page 118
Triazoles	■		■					■	■	
Turbidity (attenuated radiation method)			■	■			■	■	■	
Urea	■	■	■	■	■		■	■	■	
Zinc	■		■	■			■	■	■	



MD 600 / 610 / 640



MultiDirect



XD 7000 / 7500

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Photometer MD 100, MD 110 & MD 200



Measurements using high quality interference filters with long-life LEDs as a light source in a transparent sample chamber.

The units provide accurate, reproducible results very quickly. Other major advantages include ease of operation, ergonomic design, compact dimensions and safe handling.

Using an internal ring memory, the last 16 data sets (MD 100, MD 200) and 125 data sets (MD 110) are stored automatically with date, time, parameter and measurement value.

The tests are conducted using either Lovibond® tablet reagents with long-term stability, VARIO powder reagents or liquid reagents.

Bluetooth® is a wireless technology subject to regional approval. The use of the MD 110 with **Bluetooth®** is currently only permitted within Europe, the USA, Japan and in Canada. The use of the MD 110 will also be possible in other regions in the future. For current regions and further information, visit: bluetooth.lovibond.com Regions in which the MD 110 with **Bluetooth®** can currently be used (status: 01/2019): within Europe (according R&TTE Directive 1999/5/EC) ; USA (according to FCC part 15, comprised in FCC ID QOQBT113) ; Canada (comprised in IC 5123A-BGTBLE113), Japan (includes CAB ID 007-AB0103)

** analog IP 68 1 hour at 0.1 m*

Scroll Memory (SM)

To avoid unnecessary scrolling for the required test method, the instrument memorizes the last method used before switching off the instrument. When the instrument is switched on again, the scroll list comes up with the last used test method first.

Zero Setting (OTZ)

For certain versions of the instrument it is not necessary to zero the instrument each time. The zero setting is held in memory until the instrument is turned off. (One Time Zero - OTZ). The zero setting can be confirmed whenever it is required.

Manufacturers Test Certificate M

Besides the "Certificate of Compliance" the manufacturers test certificates M is available at cost on request. Manufacturers test certificates M are individually supplied per instrument and per method.

The manufacturers test certificate M has to be ordered together with the new instrument and cannot be delivered at a later stage.

N.I.S.T Traceability

The instrument is factory pre-adjusted to international standards. The user can set the instrument in "user calibration mode" with standards traceable to N.I.S.T. adjust.

(N.I.S.T. = National Institute of Standards and Technology)

Data Transfer

The optional available IRiM (infrared interface module) uses modern infrared technology to transmit measurement data from the **MD 100** and **MD 200** photometer to one of 3 optional interfaces.

These interfaces can be used to connect to a PC, a USB printer¹⁾ or alternatively a serial printer²⁾.

The unit is supplied complete 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.

The **MD 110** photometers have a **Bluetooth®** feature.



Via the **Bluetooth®** interface, the measurement results are transmitted to external instruments for prompt assessment and processing, so that all data can be evaluated and collated directly on site. In order to get the best use out of this, Tintometer offers an app for mobile instruments and PC software with a dongle.

The free app **AquaLX®** is ideally designed for use in on-site measurements. Compatible with iOS®- and Android® TM-based smartphones and Tablets, it enables fuss-free data transfer. It maps all measured values as descriptive graphs with minimum and maximum limits and supports export of the data as an Excel®-compatible CSV file.

With the aid of the complimentary **Bluetooth®** dongle, the PC software makes it possible to import data directly from the photometer to the Windows-based PC. As a stationary solution, it facilitates the transfer of data through a fast established, permanent wireless connection. Further processing of the results can be processed both in the software itself and by exporting the data to Excel or as a CSV file.

The set of software and **Bluetooth®** dongle is offered as separate accessories under item no.:

Code

2444480

For more information please see:
www.bluetooth.lovibond.com



Verification Standard Kit

The verification standards serve to verify the photometric accuracy and reproducibility of the results at the different wavelengths. The absorbance value is stated.

The kit contains one zero standard, six different vials for checking six different wave lengths and allows checking the complete range of MD 100 photometers.

The shelf life of the verification standard kit is two years from the date of production, provided that storage and use are in accordance with the instructions provided.

Measurements are taken in mAbs.

Verification Standard Kit 21 56 70
(MD 100, MD 110 & MD 200)



Reference Standard Kit for MD 100, MD 110 and MD 200

The reference standards are designed to check the accuracy and the reliability of the results.

It is not possible to calibrate the photometer with the reference standards.

The shelf life of reference standards is two years from the date of production, provided that storage and use are in accordance with the instructions provided.

Kit Chlorine for instruments 27 56 50
with tablet / liquid reagent 0.2* and 1.0* mg/l

Kit Chlorine for instruments 27 56 55
with tablet / liquid reagent 0.5* and 2.0* mg/l

Kit Chlorine for instruments 27 56 56
with tablet / liquid reagent 1.0* and 4.0* mg/l

Kit Chlorine for instruments 27 56 60
with powder reagent 0.2* and 1.0* mg/l

Kit pH for instruments 27 56 70
with tablet / liquid reagent 7.45* pH

* Approximate figure, actual figure specified in Certificate of Analysis

Primary standard chlorine

Ideal for validating the chlorine method. This standard is easy to handle and will meet the requirements of US EPA 334.0.



ValidCheck Chlorine 1,5 mg/l
Code.: 48 10 55 10

Please see pages 88 onwards for reagents (order codes)

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Single-Parameter MD 100 / MD 110 / MD 200

Single-Parameter

Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents		MD 100	MD 110	MD 200
Aluminium		0,01 - 0,3 mg/l Al	M40 /AL Tablet	Tablet	✓	276200	-	-	
		0,01 - 0,25 mg/l Al	M50 /AL Powder	Powder	✓	276205	-	-	
Ammonia		0,02 - 1,0 mg/l N	M60 /A Tablet	Tablet	✓	276060	-	-	
		0,01 - 0,8 mg/l N	M62 /A Powder	Powder	✓	276065	-	-	
Chlorine Tablet	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or	✓	276000	-	-	
		0,02 - 4 mg/l Cl ₂	M101 / CL6	Liquid	✓	276005	-	-	
		0,1 - 10 mg/l Cl ₂ **	M103 / CL10	Tablet		-	-	-	
Chlorine DUO		0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or	✓	276020	-	-	
		0,02 - 4 mg/l Cl ₂	M101 / CL6	Liquid					
		0,1 - 10 mg/l Cl ₂ **	M 103 / CL10	Tablet					
		0,02 - 2,0 mg/l Cl ₂	M 110 / CL2	Powder	✓	276025	-	-	
		0,1 - 8,0 mg/l Cl ₂ (10 mm multi vial-2)	M 111 / CL8	Powder	✓				
Chlorine Powder		0,02 - 2,0 mg/l Cl ₂	M 110 / CL2	Powder	✓	276010	-	-	
		0,1 - 8,0 mg/l Cl ₂ (10 mm multi vial-2)	M 111 / CL8	Powder	✓				
Chlorine HR (KI)		5 - 200 mg/l Cl ₂	M105 / CLHr	Tablet	✓	276170	-	-	
Chlorine dioxide		0,02 - 11 mg/l ClO ₂	M120 / CLO2	Tablet	✓	276030	-	-	
		0,04 - 3,8 mg/l ClO ₂	M122 / CLO2	Powder	✓	276035	-	-	
Chloride		0,5 - 25 mg/l Cl ⁻	M90 / CL-1	Tablet	✓	276180	-	-	
		5 - 250 mg/l Cl ⁻ (by dilution)	M93 / CL-2						
COD		3 - 150 mg/l O ₂	M130 / Lr	Tubes	without reagents	276120	2961202	2892502	
		15 - 300 mg/l O ₂	M133 / MLr						
		20 - 1500 mg/l O ₂	M131 / Mr						
		200 - 15000 mg/l O ₂	M132 / Hr						
Iron		0,02 - 1,0 mg/l Fe	M220 / FE	Tablet	✓	276050	-	-	
		0,02 - 1,8 mg/l Fe TPTZ	M223 / FE2	Powder	✓	276055	-	-	
		0,02 - 3,0 mg/l Fe	M222 / FE1	Powder	✓	276056	-	-	
Fluoride		0,05 - 2,0 mg/l F ⁻	M170 / F	Liquid	without reagents	276090	-	-	
Hardness total		2 - 50 mg/l CaCO ₃	M200 / th1	Tablet	✓	276190	-	-	
		20 - 500 mg/l CaCO ₃ (by dilution)	M201 / th2						
Urea		0,1 - 2,5 mg/l Urea	M390 / Ur1	Tablet and Liquid	✓	276210	-	-	
		0,2 - 5 mg/l Urea (by dilution)	M391 / Ur2						
Hazen		10 - 500 mg/l Pt-Co	M 204 / PtCo	without	without reagents	276160	-	-	
Copper		0,05 - 5,0 mg/l Cu	M150 / Cu	Tablet	✓	276080	-	-	
		0,05 - 5,0 mg/l Cu	M153 / Cu	Powder	✓	276085	-	-	
Manganese		0,2 - 4,0 mg/l Mn	M240 / Mn	Tablet	✓	276100	-	-	
		0,01 - 0,7 mg/l Mn	M242 / Mn1	Powder	✓	276105	-	-	
		0,1 - 18 mg/l Mn	M243 / Mn2	Powder	✓	276106	-	-	
Molybdenum		0,03 - 3,0 mg/l Mo	M251 / Mo1	Powder	✓ mixing cylinder (not included)	276140 19802650	-	-	
		0,3 - 40 mg/l Mo	M252 / MO2	Tablet	✓	276141	-	-	
		0,6 - 30 mg/l Mo	M250 / Mo3	Tablet	✓	276142	-	-	
Ozone (DPD)		0,02 - 2,0 mg/l O ₃	M300 / O3	Tablet	✓	-	-	2899802	



Green Chemistry

* OTZ (zero adjustment applies to all methods of the measuring instrument)

** Delivery without reagents



Please see pages 88 onwards for reagents (order codes)

Single-Parameter MD 100 / MD 110 / MD 200

Single-Parameter	Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents			
	Phosphate		0,05 - 4,0 mg/l PO ₄	M320 / PO ₄	Tablet	✓	276040	-	-
			0,06 - 2,5 mg/l PO ₄	M323 / PO ₄	Powder	✓	276045	-	-
	Silica		0,05 - 4,0 mg/l SiO ₂	M350 / Si	Tablet	Tablets	276110	-	-
			0,1 - 1,6 mg/l SiO ₂	M351 / SiLr	Powder	✓	276115	-	-
			1 - 90 mg/l SiO ₂	M352 / SiHr	Powder	✓	276116	-	-
	Suspended solids		10 - 750 mg/l TSS	M384 / SuS	without	without reagents	276150	-	-

2in1	Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents			
	Chlorine Tablet	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or Liquid	Tablets for Chlorine, pH	278020	-	-
			0,02 - 4 mg/l Cl ₂	M101 / CL6					
			0,1 - 10 mg/l Cl ₂ **	M103 / CL10	Tablet	Liquid reagents for Chlorine, pH	278025	-	-
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Chlorine Powder		0,02 - 2,0 mg/l Cl ₂	M110 / CL2	Powder	Powder reagents for Chlorine, Tablets for pH	278030	-	-
			0,1 - 8,0 mg/l Cl ₂ (10 mm multi vial-2)	M111 / CL8	Powder				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Copper	✓	0,05 - 5,0 mg/l Cu	M150 / Cu	Tablet	Tablets for Cu und pH	-	-	2872102
			6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
3in1	Hydrogen-peroxide		1 - 50 mg/l H ₂ O ₂	M213 / HP1	Liquid	Liquid reagents for H ₂ O ₂ and pH	-	-	2888102
			40 - 500 mg/l H ₂ O ₂	M214 / HP2					
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Chlorine	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or Liquid	Tablets for Chlorine, pH, CyA	278010	2980102	2860102
			0,02 - 4 mg/l Cl ₂	M101 / CL6	Liquid	Tablets CyA Liquid reagents for Chlorine, pH	278015	2980152	2882002
			0,1 - 10 mg/l Cl ₂ **	M 103 / CL10	Tablet				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Cyanuric acid		0 - 160 mg/l CyA	M160 / CyA	Tablet				
	Chlorine	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or Liquid	Tablets for Chlorine, pH, Alka-M	278060	-	2889002
			0,02 - 4 mg/l Cl ₂	M101 / CL6	Liquid	Tablets Alka-M Liquid reagents for Chlorine, pH	278065	-	2889302
			0,1 - 10 mg/l Cl ₂ **	M 103 / CL10	Tablet				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Alkalinity-m		5 - 200 mg/l CaCO ₃	M30 / tA	Tablet				
	Chlorine		0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or Liquid	Tablets for Chlorine, Chlorine dioxide	278000	-	-
	Chlorine HR (KI)		0,02 - 4 mg/l Cl ₂	M101 / CL6					
	Chlorine dioxide		5 - 200 mg/l Cl ₂	M105 / CLHr	Tablet				
	Chlorine	✓	0,02 - 11 mg/l ClO ₂	M120 / ClO2	Tablet				
	Chlorine		0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or Liquid	Tablets for Chlorine, pH, Bromine	-	-	2861802
			0,02 - 4 mg/l Cl ₂	M101 / CL6					
			6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Brome		0,05 - 13 mg/l Br ₂	M80 / Br	Tablet				
	Chlorine	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or Liquid	Tablets for Chlorine, pH, Acid capacity	-	-	2889012
			0,02 - 4 mg/l Cl ₂	M101 / CL6	Liquid	Tablets Acid capacity Liquid reagents for Chlorine, pH	-	-	2889202
			0,1 - 10 mg/l Cl ₂ **	M 103 / CL10	Tablet				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Acid capacity		0,1 - 4,0 mmol/l KS _{4.3}	M20 / S:4.3	Tablet				

* OTZ (zero adjustment applies to all methods of the measuring instrument)

** Delivery without reagents





4in1

Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents		MD 100	MD 110	MD 200
Chlorine	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or	Tablets for Chlorine, pH, CyA, Alka-M	278070	2980702	2860502	
		0,02 - 4 mg/l Cl ₂	M101 / CL6	Liquid	Tablets for CyA, Alka-M Liquid reagents for Chlorine and pH	278075	2980752	2860542	
		0,1 - 10 mg/l Cl ₂ **	M 103 / CL10	Tablet					
		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid					
		0 - 160 mg/l Cya	M160 / CyA	Tablet					
		5 - 200 mg/l CaCO ₃	M30 / tA	Tablet					
pH									
Cyanuric Acid									
Alkalinity-m									
Chlorine DUO		0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet	Powder reagents for Chlorine, Tablets for Chlorine, pH, CyA, Alka-M	278160	-	-	
		0,02 - 3,5 mg/l Cl ₂	M113 / CL2	Powder					
		5 - 200 mg/l Cl ₂ **	M105 / CLHr	Tablet					
		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid					
		5 - 200 mg/l CaCO ₃	M30 / tA	Tablet					
		0 - 500 mg/l CaCO ₃	M191 / CAH	Tablet					
pH									
Alkalinity-m									
Hardness, Calcium									
Chlorine	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or	Tablets for Chlorine, pH, CyA and Acid Capacity	-	-	2860512	
		0,02 - 4 mg/l Cl ₂	M101 / CL6	Liquid	Tablets for CyA and Acid Capacity Liquid reagents for Chlorine and pH	-	-	2860522	
		0,1 - 10 mg/l Cl ₂ **	M103 / CL10	Tablet					
		6,5 - 8,4 pH	M330/331 / pH	Tablet/Liquid					
		0 - 160 mg/l Cya	M160 / CyA	Tablet					
		0,1 - 4,0 mmol/l KS _{4,3}	M20 / S:4.3	Tablet					
pH									
Cyanuric Acid									
Acid Capacity									
Chlorine	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or	Tablets for Chlorine, pH, Acid Capacity, Urea (add. Liquid)	-	-	2862912	
		0,02 - 4 mg/l Cl ₂	M101 / CL6	Liquid					
		0,1 - 10 mg/l Cl ₂ **	M103 / CL10	Tablet					
		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid					
		0,1 - 4,0 mmol/l KS _{4,3}	M20 / S:4.3	Tablet					
		0,1 - 2,5 mg/l Urea	M390 / Ur1	Tablet/Liquid					
0,2 - 5 mg/l Urea (by dilution)	M391 / Ur2								
Chlorine	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or	Tablets for Chlorine, Chlorine dioxide, pH, Acid Capacity	-	-	2863802	
		0,02 - 4 mg/l Cl ₂	M101 / CL6	Liquid					
		0,1 - 10 mg/l Cl ₂ **	M103 / CL10	Tablet					
		Chlorine dioxide	0,02 - 11 mg/l ClO ₂	M120 / CLO2					Tablet
		pH	6,5 - 8,4 pH	M330 / M331 / pH					Tablet/Liquid
		Acid Capacity	0,1 - 4,0 mmol/l KS _{4,3}	M20 / S:4.3					Tablet

* OTZ (zero adjustment applies to all methods of the measuring instrument)
** Delivery without reagents



Please see pages 88 onwards for reagents (order codes)



	Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents	MD 100	MD 110	MD 200
5in1	Chlorine	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or Liquid	Tablets for Chlorine, pH, CyA, Alka-M, CaH	278080	-	2861202
			0,02 - 4 mg/l Cl ₂	M101 / CL6					
			0,1 - 10 mg/l Cl ₂ **	M103 / CL10	Tablet				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Cyanuric Acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
	Alkalinity-m		5 - 200 mg/l CaCO ₃	M30 / tA	Tablet				
	Hardness, Calcium		0 - 500 mg/l CaCO ₃	M191 / CAH	Tablet				
	Chlorine		0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or Liquid	Tablets for Chlorine, pH, CyA, Acid Capacity, CaH	-	-	2861212
			0,02 - 4 mg/l Cl ₂	M101 / CL6					
			0,1 - 10 mg/l Cl ₂ **	M103 / CL10	Tablet				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Cyanuric Acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
	Acid Capacity		0,1 - 4,0 mmol/l KS _{4.3}	M20 / S:4.3	Tablet				
	Hardness, Calcium		0 - 500 mg/l CaCO ₃	M191 / CAH	Tablet				
6in1	Chlorine	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or Liquid	Tablets for Chlorine, Bromine, pH, CyA, Alka-M, CaH	278090	2980902	2861902
			0,02 - 4 mg/l Cl ₂	M101 / CL6					
			0,1 - 10 mg/l Cl ₂ **	M103 / CL10	Tablet				
	Bromine		0,05 - 13 mg/l Br ₂	M80 / Br	Tablet				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Cyanuric Acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
	Alkalinity-m		5 - 200 mg/l CaCO ₃	M30 / tA	Tablet				
	Chlorine	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or Liquid	Tablets for Chlorine, Bromine, pH, CyA, Acid Capacity, CaH	-	-	2861912
			0,02 - 4 mg/l Cl ₂	M101 / CL6					
			0,1 - 10 mg/l Cl ₂ **	M103 / CL10	Tablet				
	Bromine		0,05 - 13 mg/l Br ₂	M80 / Br	Tablet				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Cyanuric Acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
	Acid Capacity		0,1 - 4,0 mmol/l KS _{4.3}	M20 / S:4.3	Tablet				
	Chlorine	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or Liquid	Tablets for Chlorine, Bromine, pH, CyA, Alka-M, Copper, Iron	-	-	2862102
			0,02 - 4 mg/l Cl ₂	M101 / CL6					
			0,1 - 10 mg/l Cl ₂ **	M103 / CL10	Tablet				
	pH		6,5 - 8,4 pH	M330/331 / pH	Tablet/Liquid				
	Cyanuric Acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
	Alkalinity-m		5 - 200 mg/l CaCO ₃	M30 / tA	Tablet				
	Copper		0,05 - 5,0 mg/l Cu	M150 / Cu	Tablet				
	Iron		0,02 - 1,0 mg/l Fe	M220 / FE	Tablet				

* OTZ (zero adjustment applies to all methods of the measuring instrument)

** Delivery without reagents





Delivery Content

- Instrument in carrying case
- **MD 100 & MD 110**
4 micro batteries (AAA)
- **MD 200**
4 micro batteries (AA),
- 3 round vials (glass) with lids
- 1 stirring rod & 1 brush & syringe
- Reagents (see tables)
- Warranty information
- Certificate (Certificate of Compliance)
- Instruction Manual



	Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents	MD 100	MD 110	MD 200
Boiler Water	Aluminium		0,01 - 0,25 mg/l Al	M50 / AL (PP)	Powder	without reagents	276230	2962302	-
	Iron		0,03 - 2 mg/l Fe ^{2+/3+}	M225 / FE (L)	Liquid				
	Copper		0,3 - 5,0 mg/l Cu	M150 / Cu (T)	Tablet				
	Silica		1 - 90 mg/l SiO ₂	M352 / SiHr (PP)	Powder				
	Chloride		0,5 - 20 mg/l Cl ⁻	M92 / CL- (L)	Liquid				
	Phosphate		5 - 80 mg/l PO ₄	M335 / PO4 (L)	Liquid				
	Oxygen (dissolved)		10 - 800 µg/l O ₂	M292 / O2	Vacu-vials				
	DEHA		20 - 500 µg/l DEHA	M167 / DEHA (PP)	Powder				
	Hydrazine		50 - 500 µg/l N ₂ H ₄	M205 / Hydr (P)	Powder				
	Polyacrylates		1 - 30 mg/l Polyacrylates	M338 / POLY (L)	Liquid				
Cooling Water	Bromine		0,05 - 13 mg/l Br ₂	M80 / Br (T)	Tablet	without reagents	276240	2962402	-
	Chlorine		0,01 - 6,0 mg/l Cl ₂	M100 / CL6 (T)	Tablet				
	Chlorine HR (KI)		5 - 200 mg/l Cl ₂	M105 / CLHr (T)	Tablet				
	Chlorine dioxide		0,02 - 11 mg/l ClO ₂	M100 / CL6 (T) (Factor 1,9)	Tablet				
	Ozone		0,02 - 2 mg/l O ₃	M300 / O3 (T)	Tablet				
	Aluminium		0,01 - 0,25 mg/l Al	M50 / AL (PP)	Powder				
	Iron		0,03 - 2 mg/l Fe ^{2+/3+}	M225 / FE (L)	Liquid				
	Iron in Mo		0,01 - 1,8 mg/l Fe	M224 / FEM(PP)	Powder				
	Copper		0,3 - 5,0 mg/l Cu	M150 / Cu (T)	Tablet				
	Zinc		0,1 - 2,5 mg/l Zn	M405 / Zn (L)	Liquid				
	Sulfate		5 - 100 mg/l SO ₄	M360 / SO4 (PP)	Powder				
	Molybdenum		0,03 - 3 mg/l Mo	M251 / Mo1 (PP)	Powder				
			0,6 - 60 mg/l Mo	M254 / Mo2 (L)	Liquid				
	Triazoles		1 - 16 mg/l Benzotriazoles	M388 / tri (PP)	Powder				
	Polyacrylates		1 - 30 mg/l Polyacrylates	M338 / POLY (L)	Liquid				

➔ Please see pages 88 onwards for reagents (order codes)

Accessories

Item	Code
Set of 12 round vials with lid height 48 mm, Ø 24 mm	19 76 20
Set of 5 round vials with lid height 48 mm, Ø 24 mm	19 76 29
Satz à 10 round vials with lid, height 90 mm, Ø 16 mm	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 , □ 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), acrylic glass	41 89 57
Mixing cylinder, 25 ml, with stopper required accessory for molybdenum LR test with MD 100 (276140)	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
4 micro batteries (AAA) MD 100, MD 110	19 50 026
4 batteries (AA) MD 200	19 50 025
Battery lid MD 100, MD 110	19 80 26 17
Battery lid MD 200	19 80 22 41
Measuring beaker, volume 100 ml	38 48 01
Plastic funnel with handle	47 10 07
Plastic stirring rod, 13 cm length	36 41 00
Plastic stirring rod, 13 cm length, (10 pcs.)	36 41 20
Plastic stirring rod, 10 cm length	36 41 09
Plastic stirring rod, 10 cm length, (10 pcs.)	36 41 30
Infrared data transfer module IRiM (MD 100, MD 200 only)	21 40 50
Bluetooth-Dongle and Software (MD110 only)	24 44 480

Technical Data	MD 100	MD 110	MD 200
Interface for data transfer	Infrared interface (IRiM needed)	Bluetooth® -interface	Infrared interface (IRiM needed)
Storage	internal ring memory for 16 data sets	internal ring memory for 125 data sets	internal ring memory for 16 data sets
Power Supply	4 micro batteries (AAA), capacity approx. 17 hours or approx. 5000 tests in continuous operation with the display lighting switched off	4 micro batteries (AAA), capacity approx. 17 hours or approx. 5000 tests in continuous operation with the display lighting and Bluetooth® Function switched off	4 batteries (AA), capacity approx. 53 hours or 15000 tests (continuous operation without display lighting)
Dimensions	155 x 75 x 35 mm (L x W x H)		190 x 110 x 55 mm (L x W x H)
Weight	basic unit ca. 260 g		basic unit ca. 455 g (batteries incl.)
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 Accuracy⁴⁾	3 % FS (T = 20 °C - 25 °C)		
Photometric Resolution	0,01 A		
Absorption range	-2600 to 2600 m Abs		
Auto - OFF	automatic switch-off		
Display	backlit LCD (on keypress)		
Time	real time clock and date		
Calibration	factory calibration and user calibration. Reset to factory calibration possible		
Environmental conditions	temperature: 5 - 40 °C rel. humidity: 30 - 90 % (non condensing)		
Conformity	CE		

⁴⁾ tested with standard solutions



Thermoreactor RD 125

For the tube test digestion of

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



Chemical digestion of samples is required for the photometric determination of COD, TOC, total phosphate and total nitrogen.

The required temperatures and reaction time can be selected by using the membrane keypad of the reactor RD 125. The unit works at three different temperatures (100 / 120 / 150 °C) and three pre-set reaction times 30 / 60 / 120 minutes). When digestion is complete, the reactor automatically switches off and gives a corresponding LED indication with short beep alarm.

The RD 125 reactor is fitted with 24 slots for 16 mm diameter vials.

The voltage can be selected between 230 V and 115 V at the rear on the instrument.

COD Reactor RD 125 Order code: 2 41 89 40

Technical data

Power supply	230 V / 50-60 Hz or 115 V / 50-60 Hz (switchable)
Power	550 W
Dimensions	248 x 219 x 171 mm
Weight	3.9 kg
Materials, housing	ABS
Protection grid	PPS
Lid	PC
Block insert	PBT
Heating block	Aluminium
Holes in the aluminium block	24 slots, 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.
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

CE-Conformity

Waste Water Setups

Waste Water Setup MD 600 21 41 00
Photometer MD 600 with standard accessory,
Infrared data transmission module IRiM

Waste Water Setup MD 610 21 41 10
Photometer MD 600 with standard accessory
Bluetooth® data transmission

Waste Water Setup SpectroDirect 71 21 00
Spectrophotometer SpectroDirect
with standard accessory, 5 round vials ø 24 mm

Delivery Content

- Photometer
- Thermoreactor RD 125
- Tube stand
- Membrane filter set
- Instruction manual
- Warranty information
- Reagents for the following ranges
COD 3 - 150 mg/l and 20 - 1500 mg/l
Ammonia 1 - 50 mg/l N,
Nitrate 1 - 30 mg/l N,
Nitrite LR 0,01 - 0,3 mg/l N
Nitrogen 5 - 150 mg/l N
Phosphate 0,02 - 1 mg/l P /
0,06 - 3,5 mg/l PO₄

Reagents & Accessories

COD 3-150 mg/l O ₂ (VARIO) (25 pc.), mercury free ¹⁾	2 42 07 10
(25 pc.)	2 42 07 20
(150 pc.)	2 42 07 25
COD 15-300 mg/l O ₂ new! (25 pc.)	2 42 31 20
COD 20-1500 mg/l O ₂ (VARIO) (25 pc.), mercury free ¹⁾	2 42 07 11
(150 pc.), mercury free ¹⁾	2 42 07 16
(25 pc.)	2 42 07 21
(150 pc.)	2 42 07 26
COD 200-15000 mg/l O ₂ (VARIO) (25 pc.), mercury free ¹⁾	2 42 07 12
(25 pc.)	2 42 07 22
(150 pc.)	2 42 07 27

Ammonia VARIO HR tube test	53 56 50
Nitrate VARIO tube test	53 55 80
Nitrite LR VARIO powder pack	53 09 80
Nitrogen VARIO Total HR tube test	53 55 60

ValidCheck WW Influent Multi-Standard	
102 ml Standard solution	
+ 21 ml Standard solution new!	48399712
COD 500 mg/l	
NO ³⁻ -N 2 mg/l	
PO ₄ ³⁻ -P 10 mg/l	

ValidCheck WW Effluent Multi-Standard new!	
102 ml Standard solution	
+ 21 ml Standard solution	48399612
COD 40 mg/l	
NO ³⁻ -N 10 mg/l	
P (total) 1 mg/l	
Set of round vials with lids	19 76 29
Height 48 mm, Ø 24 mm	
Membrane filter set for use	36 61 50
when preparing samples, 25 membrane	
filters 0.45 µm, 2 syringes 20 ml	
Vial stand for 6 round vials	41 89 51
Ø 24 mm, acrylic glass	
Vial stand for 10 vials	41 89 57
(Ø 16 mm), acrylic glass	
Automatic pipette ²⁾ , 1 - 5 ml	41 90 76
Pipette tips ²⁾ , 1 - 5 ml (white),	41 90 66
100 pc.	
Automatic pipette ³⁾ , 0.1 - 1 ml	41 90 77
Pipette tips ³⁾ , 0.1 - 1 ml (white),	41 90 73
1000 pc.	

¹⁾ without chloride removal

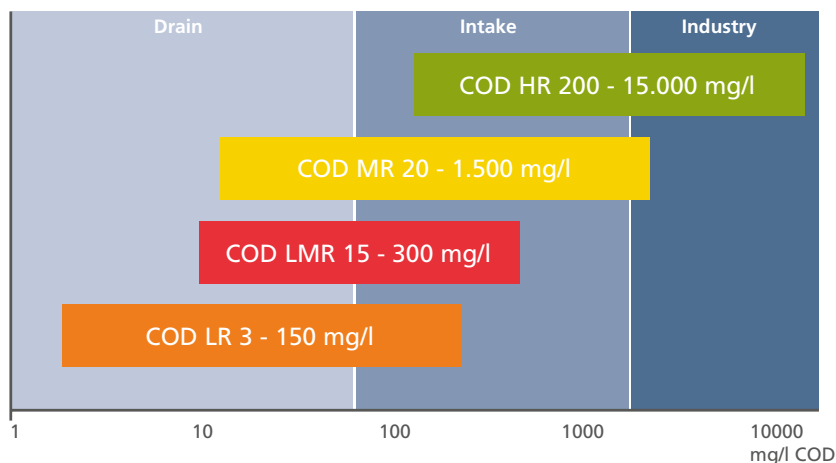
²⁾ LR, LMR, HR

³⁾ HR

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further information on page 83

The right COD tube test for every application



No exposure risk to users due to closed cuvettes

easy scanning by barcodes

10 times less toxic waste than a standard laboratory method

easy to perform & cost-effective

reliable & accurate, as proven by inter-laboratory tests

standardized method according to ISO 15705: 2002

COD determination

Cost-effective, easy & safe

Now with additional middle LMR range!

COD Photometers

With a measuring range from 0 to 15,000 mg/l O₂, the Lovibond® COD photometers are suitable for waste water testing.

Two LEDs light sources with long-term stability ($\lambda_1 = 610 \text{ nm}$; $\lambda_2 = 430 \text{ nm}$, according to ISO 15705:2002), a waterproof sample chamber, a large digital display, and the user-friendly keypad ensure maximum operating reliability and convenience.

MD 100 COD (in case) Code: 27 61 20

MD 110 COD (in case) Code: 296 12 02

MD 200 COD (in case) Code: 289 25 02

Setups COD

The Lovibond® COD Setups allow highly sensitive and precise water testing with minimum effort.

COD Setup MD 100 Code: 27 61 30
Instrument in carrying case

COD Setup MD 110 Code: 29 61 302
Instrument in carrying case

COD Setup MD 200 Code: 289 26 02
Instrument in carrying case

COD Setup MD 600 Code: 21 40 40
Instrument in carrying case

COD Setup MD 610 Code: 21 40 41
Instrument in carrying case

COD VARIO Tube tests

The Lovibond® COD VARIO tube tests are available for the measuring ranges 3-150 mg/l O₂, 15-300 mg/l O₂, 20-1500 mg/l O₂ and 200-15000 mg/l O₂. Their chemical properties and a 16 mm tube diameter make them compatible to Hach® instruments.*

Tube tests

COD LR 3-150 mg/l O₂ (VARIO)
(25 pc.), mercury free ¹⁾ 2 42 07 10
(25 pc.) 2 42 07 20
(150 pc.) 2 42 07 25

COD LMR 15-300 mg/l O₂ **new!** 2 42 31 20
(25 pc.)

COD MR 20-1500 mg/l O₂ (VARIO)
(25 pc.), mercury free ¹⁾ 2 42 07 11
(150 pc.), mercury free ¹⁾ 2 42 07 16
(25 pc.) 2 42 07 21
(150 pc.) 2 42 07 26

COD HR 200-15000 mg/l O₂ (VARIO)
(25 pc.), mercury free ¹⁾ 2 42 07 12
(25 pc.) 2 42 07 22
(150 pc.) 2 42 07 27

¹⁾without chloride removal

*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 compatibility of these products for use in HACH® brand spectrophotometers or other instruments or systems.

Standard solutions

Standard solutions are solutions with a defined concentration and are provided to check the operation methods and instruments of the cuvette tests as well as the condition of optical filters and the instrument.

Standard solution	Quantity	Code
100 mg/l COD	30 ml	2 42 08 03
500 mg/l COD	30 ml	2 42 08 04
5000 mg/l COD	10 ml	2 42 08 05

Valid Check

Valid Check COD (120 mg/l)	250 ml	48371425
Valid Check COD (500 mg/l)	250 ml	48371625
Valid Check COD (5000 mg/l)	250 ml	48371825

available in Q 4!

Delivery Content

- Photometer
- Adapter for round vials ø 16 mm
- 2 sets of tube tests 3-150 mg/l 20-1500 mg/l
- Thermoreactor RD 125
- Tube stand
- 2 syringes 1 ml, 2 ml
- Batteries
- Warranty information
- Certificate (COC)
- Instruction manual

Please see pages 88 onwards for reagents (order codes)



*Highest/reproducible
precision with
interference filter*

*Infrared-
Interface
(MD 600)*

*Bluetooth® 4.0
Interface
(MD 610)*

Photometers MD 600 & MD 610

*Display with
background
lighting*

*More than
120 pre-
programmed
methods*

*Automatic
selection of
wavelength*

 Bluetooth

Modern, mobile
photometer for rapid,
reliable water testing



The MD 610 and MD 600 give you mobile instruments in a modern design with the analytical features of laboratory photometers.

All important water analysis parameters from A(luminium) to Z(inc) are covered by these instruments. Combined with the high precision of Lovibond® reagents, a reliable and quick analysis of water samples is guaranteed. Reagent tablets, powder reagents, liquid reagents, or cuvette tests are used depending on the method.

The highest accuracy is guaranteed by the combination of six long-term stable LEDs as the light source together with interference filters, even when being used in absorption mode. The instruments are designed without moving parts and thus maintenance are free measuring units. While the MD 600 has an infrared interface for data exchange, the MD 610 is equipped with a modern **Bluetooth®** 4.0 interface. Measurement data can thus easily be transferred from the MD 610 to smartphones or tablets. To support this, the free app AqualX® is available. For stationary use, the set of PC software and **Bluetooth®** dongle availability as an accessory can alternatively be used for data transfer to a Windows-based PC.

The proven MD 600 photometer uses the classic infrared interface with which data can be transferred by means of the IRiM module to the PC or laptop.



N.I.S.T. Traceability

The instrument is factory pre-adjusted to international standards. The user can set the instrument in "user calibration mode" with standards traceable to N.I.S.T. adjust.

(N.I.S.T. = National Institute of Standards and Technology)

New methods

Test methods are regularly updated to suit market requirements. You can find software updates for new methods and additional languages on our website at www.lovibond.com.

You can program your own methods. This could be done via calibration functions in form of polynomials or by concentration measurements.

Polynomials

Up to 25 fifth order calibration polynomials ($y = A + Bx + Cx^2 + Dx^3 + Ex^4 + Fx^5$) can be stored for custom methods.

Concentration

With this function 2 to 14 standards can be measured. The photometer saves the value pairs obtained as calibration points of a user method (up to 10 methods).



Delivery Content

- Instrument in carrying case
- 4 batteries
- 3 round vials each 24 and 16 mm ø
- 1 adapter each for 16 mm and 13 mm vials
- Plastic stirring rod 13 cm, Brush 11 cm, screw driver
- Warranty information
- Certificate of Compliance
- Instruction Manual

Order codes (without reagents)

MD 600: 21 40 20

MD 610: 21 40 25

Please specify the reagents or parameters required at time of order.

Up-to-date information about methods, parameters and measuring ranges can always be found on our website: www.lovibond.com

Applications

- Waste Water
- Drinking Water
- Industrial Process Water
- Science & Research
- Governmental and private Laboratories
- Mobile Applications

➔ Please see pages 88 onwards for reagents (order codes)

Bluetooth® is a wireless technology subject to regional approval. The use of the MD 610 with **Bluetooth®** is currently only permitted within Europe, the USA, Japan and in Canada. The use of the MD 610 will also be possible in other regions in the future. For current regions and further information, visit: bluetooth.lovibond.com

Regions in which the MD 610 with **Bluetooth®** can currently be used (status: 01/2019): within Europe (according R&TTE Directive 1999/5/EC); USA (according to FCC part 15, comprised in FCC ID QOQBT113); Canada (comprised in IC 5123A-BGTBLE113), Japan (includes CAB ID 007-AB0103)



Photometers MD 600 & MD 610



Technical Data

Display	Backlit graphic-display
Interfaces	Infrared ¹ (MD 600), Bluetooth® 4.0 (MD 610) RJ45 socket for updates ²
Optics	LEDs, interference filters and photo sensor in transparent sample chamber Wavelength range: 430 nm IF $\Delta\lambda = 5$ nm 530 nm IF $\Delta\lambda = 5$ nm 560 nm IF $\Delta\lambda = 5$ nm 580 nm IF $\Delta\lambda = 5$ nm 610 nm IF $\Delta\lambda = 6$ nm 660 nm IF $\Delta\lambda = 5$ nm IF = interference filter
Wavelength Accuracy	± 1 nm

Photometric Accuracy*	2 % FS (T = 20 °C – 25 °C)
Photometric Resolution	0.005 A
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 update
Memory Capacity	approx. 1000 data sets (MD 600) approx. 500 data sets (MD 610)
Auto-Off	approx. 20 minutes after last keypress with audible signal

Power Supply	4 batteries (Mignon AA/LR6); Operation time: approx. 26 h continuous operation or 3500 tests
Dimensions	approx. 210 x 95 x 45 mm (unit) approx. 395 x 295 x 106 mm (case)
Weight (unit)	approx. 450 g
Ambient Conditions	5–40 °C at max. 30–90 % rel. humidity (non condensing)

CE-Conformity

¹ optional available: IRiM (Infrared Interface Modul)

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

* tested with standard solutions

Please see pages 88 onwards
for reagents (order codes)

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IOS® is a registered trademark of Cisco, Inc. and licensed to Apple, Inc. Android™ is a trademark of Google, Inc.

Accessories

Item	Code
Set of 12 round vials with lid Height 48 mm, Ø 24 mm	19 76 20
Set of 10 round vials with lid height 90 mm, Ø 16 mm	19 76 65
Adapter for round vials Ø 16 mm	19 80 21 90
Adapter for round vials Ø 13 mm	19 80 21 92
Set of multi vials-3 with lids path length 10 mm, 10 ml volume Height 48 mm, Ø 24 mm (12 pc.)	19 76 05
Vial stand for 6 round vials Ø 24 mm, acrylic glass	41 89 51
Vial stand for 10 vials (Ø 16 mm), acrylic glass	41 89 57
Sealing ring for vial Ø 24 mm (12 pc.)	19 76 26
Sealing ring for vial Ø 24 mm (black)	19 76 36
Battery, 1.5 V, AA-Alkali-Mangan (4 pc.)	19 50 025
Cleaning cloth for vials	19 76 35
Plastic funnel with handle	47 10 07
Plastic stirring rod, 13 cm length	36 41 00
Plastic stirring rod, 13 cm length, (10 pc.)	36 41 20
Plastic stirring rod, 10 cm length	36 41 09
Plastic stirring rod, 10 cm length, (10 pc.)	36 41 30
Cleaning brush, 10 cm	38 02 30
Verification Standard Kit	21 56 40
Reference Standard-Kit Chlorine 0,2 and 1mg/l	21 56 30
Reference Standard-Kit Chlorine 0,5 and 2mg/l	21 56 35
Reference Standard-Kit Chlorine 1 and 4mg/l	21 56 36
Cable for update for connection to a PC	21 40 30
Data transmission modul IRIIM	21 40 50
Bluetooth Dongle Set incl. PC Software	24 44 480

Verification Standard Kit

The verification standards serve to verify the photometric accuracy and reproducibility of the results at the different wavelengths. The absorption value is stated.

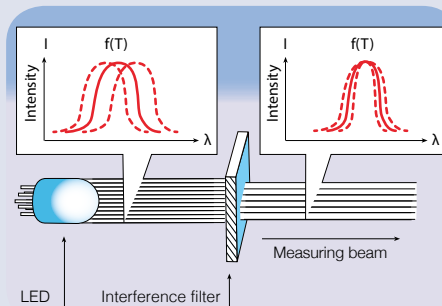
The kit contains one zero standard, six different vials for checking six different wave lengths and allows checking the complete range of MD 600 and MD 610 photometers.

The shelf life of the verification standard kit is two years from the date of production, provided that storage and use are in accordance with the instructions provided. Measurements are taken in mAbs.

Verifications Standard Kit **21 56 40**
(MD 600, MD 610, MD 640)



Interference filter increases reducibility



LEDs have very positive qualities as a light source for photometers:

They achieve a very high intensity in a limited spectral range, which enables low-cost optical set-ups. They are very energy-efficient, which ensures a long operating life when battery operated. They have a long service life and usually last the life of the photometer.

However, the semiconductors inside the LEDs react to temperature fluctuations and are subject to changes during their lifetime. These lead to fluctuations in both the emitted wavelength, the spectral bandwidth and the intensity. While intensity fluctuations are still occur by zeroing the instrument can compensate before a measurement, a constant measuring wavelength cannot be achieved without the use of high-quality interference filters.

Only when interference filters are used is it possible to ensure that their analytical methods are reproducible.

All Lovibond LED photometers use high-quality interference filters with a half-width of approx. 5 nm.

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Regions in which the MD 610 with **Bluetooth®** can currently be used (status: 01/2019):

within Europe (according R&TTE Directive 1999/5/EC) ; USA (according to FCC part 15, comprised in FCC ID QQQT113) ; Canada (comprised in IC 5123A-BGTBLE113), Japan (includes CAB ID 007-AB0103)

Windows® is a registered trademark of Microsoft Corporation in the United States and other countries.

Please see pages 88 onwards for reagents (order codes)



Photometer & Fluorometer for PTSA in one instrument MD 640



Photometry, trace analysis and tracer detection in one instrument

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The Lovibond® Photometer MD 640 is an enhanced version of the MD 610 photometer, offering additional fluorescence capability for the determination of PTSA and fluorescein in water systems.

PTSA (1,3,6,8 pyrenetetrasulfonic acid, sodium salt) and **fluorescein** are fluorescent materials that are increasingly being added to speciality water treatment products to enable real time product dose analysis. Both materials are detectable at ppb levels, are non-toxic and chemically stable, all of which make them ideal tracer additives throughout complex water systems. Accurately measuring product dose levels helps the water treatment specialist to control water chemistry; prevent corrosion, scale and biological fouling; increase system efficiency and, ultimately, save energy and costs.

Delivery Content

- Instrument in carrying case
- 4 batteries
- 3 round vials each 24 and 16 mm ø (black lid)
- 1 adapter each for 16 mm and 13 mm vials
- Plastic stirring rod 13 cm, Brush 11 cm, syringe 5 ml, screw driver
- Warranty information
- Certificate of Compliance
- Instruction Manual

Order codes (without reagents)

MD 640: 21 41 40

Please specify the reagents or parameters required at time of order.

You can find updated information on parameters and measuring ranges at www.lovibond.com

Applications

- Industrial Process Water & Waste Water
- Drinking Water
- Science & Research
- Governmental and Private Laboratories
- Mobile Applications

Bluetooth® is a wireless technology subject to regional approval. The use of the MD 640 with **Bluetooth®** is currently only permitted within Europe, the USA, Japan and in Canada. The use of the MD 640 will also be possible in other regions in the future. For current regions and further information, visit: bluetooth.lovibond.com
Regions in which the MD 640 with **Bluetooth®** can currently be used (status: 01/2019):
within Europe (according R&TTE Directive 1999/5/EC) ; USA (according to FCC part 15, comprised in FCC ID QOQBLE113) ; Canada (comprised in IC 5123A-BGTBLE113), Japan (includes CAB ID 007-AB0103)

Technical Data

Display	Backlit graphic-display
Interfaces	Bluetooth® 4.0 RJ45 socket for Internet updates ¹
Optics	LEDs, interference filters (IF) and photo sensor in transparent sample chamber Wavelength range: 430 nm IF $\Delta\lambda = 5$ nm 530 nm IF $\Delta\lambda = 5$ nm 560 nm IF $\Delta\lambda = 5$ nm 580 nm IF $\Delta\lambda = 5$ nm 610 nm IF $\Delta\lambda = 6$ nm 660 nm IF $\Delta\lambda = 5$ nm IF = interference filter
UV excitation	375 nm
Measurement Ranges	PTSA 10 - 1000 ppb Fluorescein 10 - 400 ppb
Calibration Check	Monthly (user) (using calibration sets)
Calibration	Factory set & user adjustable (using calibration Standard Set)
Wavelength Accuracy	± 1 nm
Photometric Accuracy*	2 % FS (T = 20 °C – 25 °C)
Photometric Resolution	0.005 A
Operation	Acid and solvent resistant, touch-sensitive keypad with audible feedback via integrated beeper
Power Supply	4 batteries (Mignon AA/LR6); Operation time: approx. 26 h continuous operation or 3500 tests
Auto-Off	Approx. 20 minutes after last keypress with audible signal
Dimensions	Approx. 210 x 95 x 45 mm (unit) approx. 395 x 295 x 106 mm (case)
Weight (unit)	Approx. 450 g
Ambient Conditions	5–40 °C at max. 30–90 % rel. humidity (non condensing)
Language Selection	German, English, French, Spanish, Italian, Portuguese, Polish, Indonesian ; additional languages via Internet update
Memory Capacity	Approx. 500 data sets
CE-Conformity	

Accessories

Item	Code
Set of 12 round vials with lid Height 48 mm, Ø 24 mm	19 76 20
Set of 12 round vials with black lid for PTSA / Fluorescein Height 48 mm, Ø 24 mm	19 76 57
Set of 10 round vials with lid Height 90 mm, Ø 16 mm	19 76 65
Adapter for round vials ø 16 mm	19 80 21 90
Adapter for round vials ø 13 mm	19 80 21 92
Set of multi vials-3 with lids path length 10 mm, 10 ml volume Height 48 mm, Ø 24 mm (12 pc.)	19 76 05
Vial stand for 6 round vials Ø 24 mm, acrylic glass	41 89 51
Vial stand for 10 vials (Ø 16 mm), acrylic glass	41 89 57
Sealing ring for vial ø 24 mm (12 pc.)	19 76 26
Sealing ring for vial ø 24 mm (black)	19 76 36
Battery, 1.5 V, AA-Alkali-Mangan (4 pc.)	19 50 025
Cleaning cloth for vials	19 76 35
Plastic funnel with handle	47 10 07
Plastic stirring rod, 13 cm length	36 41 00
Plastic stirring rod, 13 cm length, (10 pc.)	36 41 20
Plastic stirring rod, 10 cm length	36 41 09
Plastic stirring rod, 10 cm length, (10 pc.)	36 41 30
Cleaning brush, 10 cm	38 02 30
Verification Standard Kit	21 56 40
Cable for update for connection to a PC	21 40 30
PTSA standard addition solution, 1000 ppb, 50ml	46 12 10
PTSA calibration set (0, 200, 1000 ppb)	46 12 45
Fluorescein standard addition solution, 400 ppb, 50ml	46 12 30
Fluorescein calibration set (0, 75, 400 ppb)	46 12 40
Bluetooth Dongle Set incl. PC Software	24 44 480

¹⁾ optional available: connection cable with integrated electronics (RS 232 / RJ-45 plug)

* tested with standard solutions





Photometer MultiDirect



The MultiDirect is a contemporary, microprocessor-controlled photometer with ergonomically designed keypad and large-format graphic display. It is equipped with a wide range of pre-programmed methods based on the proven range of Lovibond® tablet reagents, liquid reagents, tube tests and powder reagents (VARIO Powder Packs). Users can also store their own methods.

The MultiDirect has 6 precision interference filters using different wavelengths.

The unique design of the optics allows the automatic selection of the required wavelength without any moving parts. This and the dual beam technology utilizing an internal reference channel, guarantees the highest accuracy.

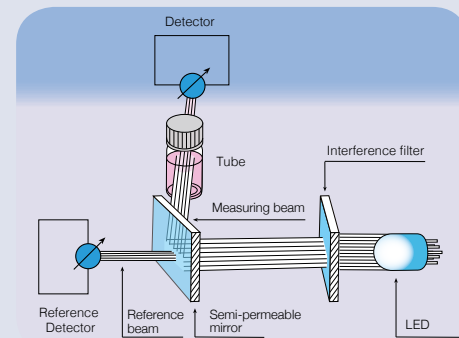
For portable use, the instrument operates with seven standard rechargeable batteries (supplied). These batteries are available all over the world and are easily changed.

The integrated intelligent charge controller allows simultaneous operation of the unit and battery charging (using the supplied power pack).

The MultiDirect also operates without a power pack by using alkaline manganese batteries.

The entire instrument, including sample chamber (the most critical component of any photometer) and battery compartment, is waterproof, ensuring that no water comes in contact with the electronic components.

Dual Beam Technology



The two-beam technology with one internal reference channel guarantees highest accuracy.

Dual Beam technology and Interference filters for highest accuracy

Long-term stable LEDs as light sources

Update of new methods & languages via Internet (free of charge)

A wide range of pre-programmed methods



N.I.S.T. Traceability

The instrument is factory pre-adjusted to international standards. The user can set the programmed instrument in "user calibration mode" with standards traceable to N.I.S.T. adjust.

(N.I.S.T. = National Institute of Standards and Technology)

New methods

Test methods are regularly updated to suit market requirements. You can find software updates for new methods and additional languages on our website at www.lovibond.com.

Polynomials

From measured data pairs (concentration Absorption), the user can create a polynomial an obedient polynomial as a calibration function for own methods serves.

A known polynomial may also be used. 25 order polynomials ($y = A+Bx+Cx^2 + Dx^3 + Ex^4 + Fx^5$) can be stored together with user-specific parameters such as wavelength, measuring range, unit and number of decimals.

Concentration

Alternatively, calibration functions for your own methods can be created by measuring two to fourteen standards. On the basis of the concentrations/absorption pairs obtained, the photometer will calculate a linear interpolation between the measured points. Up to 10 methods can be stored for further sample measurements.

Applications

- Waste Water
- Drinking Water
- Industrial Process Water
- Science & Research
- Governmental and Private Laboratories
- Mobile Applications

➔ Please see pages 88 onwards for reagents (order codes)



Photometer MultiDirect



Delivery Content

- Instrument in carrying case
- 7 rechargeable batteries
- 1 lithium battery
- Mains charger, 100-240 V
- PC connection cable
- 3 round vials each 24 and 16 mm ø
- 1 adapter for 16 mm ø vials
- 3 syringes
- 1 plastic beaker 100 ml
- Warranty information
- Certificate of Compliance
- Instruction Manual

Order code: 21 00 00-B

Order code: 21 00 00

(without lithium battery and reagents)

Technical Data

Display	Graphic-display	Power Supply	7 Ni-MH-battery pack (AA/Mignon), charged whilst in the unit with external mains charger, integrated overload cut-out
Optics	6 temperature compensating LED, internal reference channel, photodiode in protected sample chamber	Dimensions (L x W x H)	265 x 195 x 70 mm
Wavelengths	6 interference filters in one unit, $\lambda_1 = 430 \text{ nm IF } \Delta \lambda \text{ (nm)} = 5$, $\lambda_2 = 530 \text{ nm IF } \Delta \lambda \text{ (nm)} = 5$, $\lambda_3 = 560 \text{ nm IF } \Delta \lambda \text{ (nm)} = 5$, $\lambda_4 = 580 \text{ nm IF } \Delta \lambda \text{ (nm)} = 5$, $\lambda_5 = 610 \text{ nm IF } \Delta \lambda \text{ (nm)} = 6$, $\lambda_6 = 660 \text{ nm IF } \Delta \lambda \text{ (nm)} = 5$ IF = interference filter	Weight (unit)	approx. 1000 g with rechargeable batteries
Interface	RS232 for printer and PC-connection	Ambient Conditions	up to max. 90 % humidity (non condensing) approx. 5–40 °C
Download	Software and methods update by means of the internet	Auto-Off	approx. 20 minutes after last keypress with no loss of data
Operation	Acid and solvent resistant, touch-sensitive keypad with audible feedback	Auto-Check	By pressing ON/OFF-key
		Memory Capacity	approx. 1000 data sets with date, time and registration number
		Approval	CE

Please specify the reagents or parameters required at time of order.

You can find updated information on parameters and measuring ranges on our website at www.lovibond.com

Please see pages 88 onwards for reagents (order codes)



Accessories

Item	Code	Item	Code
Set of 12 round vials with lid Height 48 mm, Ø 24 mm	19 76 20	Cleaning brush, 10 cm	38 02 30
Set of 10 round vials with lid Height 90 mm, Ø 16 mm	19 76 65	Syringe, plastic, 2 ml	36 90 80
Adapter for round vials Ø 16 mm	19 80 10 94	Syringe, plastic, 5 ml	36 61 20
Lid for adapter	19 80 11 00	Syringe, plastic, 10 ml	36 90 90
Vial stand for 6 round vials Ø 24 mm, acrylic glass	41 89 51	Rubber seal cap	19 80 15 01
Vial stand for 10 vials (Ø 16 mm), acrylic glass	41 89 57	Mains charger, 100-240 V, 50-60 Hz, with international adapters	19 30 10
Sealing ring for vial Ø 24 mm (12 pc.)	19 76 26	Cable for connection to PC, serial 9-pins	19 81 98
Cleaning cloth for vials	19 76 35	AA Ni-MH, 1100 mAh (7 pc.)	19 50 02 0
Adapter for Vacu-vial®	19 20 75	Lithium battery	19 50 01 7
Plastic beaker, 100 ml	38 48 01	Verification Standard Kit	21 56 50
Plastic funnel with handle	47 10 07	Plain paper printer Incl. mains adapter and RS 232 cable	198077
Plastic stirring rod, 13 cm length	36 41 00		
Plastic stirring rod, 13 cm length, (10 pc.)	36 41 20		
Plastic stirring rod, 10 cm length	36 41 09		
Plastic stirring rod, 10 cm length, (10 pc.)	36 41 30		

Verification Standard Kit

The verification standards serve to verify the photometric accuracy and reproducibility of the results at the different wavelengths. The absorption value is stated.

The kit contains one zero standard, six different vials for checking six different wave lengths and allows checking the complete range of the MultiDirect photometer.

The shelf life of the verification standard kit is two years from the date of production, provided that storage and use are in accordance with the instructions provided.

Measurements are taken in mAbs.

Verification Standard Kit **21 56 50**
(MultiDirect)





Spectrophotometer SpectroDirect

The SpectroDirect is a solid single-beam spectrophotometer with an excellent price/performance ratio that is specifically designed for water testing.



Optics

The light source is a tungsten halogen lamp. The lamp is switched on only momentarily during the measurement process¹⁾, so there is no need for a warm-up period.

The SpectroDirect is ready to perform a self-test as soon as it is switched on.

The light passes through an entry slot to the monochromator, where it is split into spectral ranges. The monochromator is a holographically produced, transparent grating. The movable mirror ensures that light of the desired wavelength is focused automatically so that it passes through the exit slot, into the sample chamber and therefore through the water sample. The light that is not absorbed by the sample travels to the silicon photodiode detector. This signal is then evaluated by a microprocessor and shown as a result in the display.

Multifunctional sample chamber

Round vials measuring 16 mm and 24 mm in diameter and rectangular cells with pathlengths from 10 to 50 mm may be used without an adapter. Only the 10 mm cell will be fixed by a little holder that must be inserted into the sample chamber.

Operator guidance and functions

The choice of language is prompted in the display and can be switched to German, English, French, Italian, Spanish or Portuguese. When further languages become available, they will be updated via internet.

In addition to the pre-programmed Lovibond® methods, the user can also program 35 own methods (10 user concentration methods and 25 user polynomials). Other functions include the automatic count-down function in various methods, differentiated determination for some methods, absorption / transmission, spectral uptake, kinetics and up to 7 concentrations (linear).

Data transfer

The RS232 interface at the rear allows direct connection and data transfer to a PC or printer with serial interface. Up to 1000 records can be saved with a date, time, running test and code number as well as the measuring range and the method number.

Updates for new methods and additional languages can be found on our website: www.lovibond.com.

Power supply

The required input voltage is 12 V. The SpectroDirect is connected to an external power pack as standard. Battery operation is also possible by using an external energy station (see accessories).

Traceability

The instrument can be checked by the user with a secondary standard filter set (order no.: 711160) with DAkkS calibration certificate. The user can set the instrument in "user calibration mode" with standards traceable to N.I.S.T. adjust.

(N.I.S.T. = National Institute of Standards and Technology)

 **Please see pages 88 onwards for reagents (order codes)**

Technical data

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
CE-Conformity	

Accessories

Item	Code
Replacement halogen lamp	71 10 00
Magnetic pin (for updates)	19 80 16 87-2
Connection cable to a PC	19 81 97
Connection to a 12 V plug	71 10 40
Case for transport	71 20 50
Secondary standard filter set with certificate	71 11 60
Plastic funnel with handle	47 10 07
Cleaning cloth for vials	19 76 35
Power supply unit 100-240 V / 50-60 Hz	71 10 90
Energy station for SpectroDirect and XD for mobile power supply	71 10 51
12 round vials with lid Height 48 mm, 24 mm Ø	19 76 20
5 round vials with lid Height 48 mm, 24 mm Ø	19 76 29
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), acrylic glass	41 89 57
W 100, rectangular cell optical glass OG, 10 mm path length	60 10 40
W 100, rectangular cell optical glass OG, 50 mm path length	60 10 70
W 110, rectangular cell Quartz-UV-glass, 10 mm path length	66 11 30
Plain paper printer Incl. mains adapter and RS 232 cable	198077



Photometry

Delivery Content

SpectroDirect (standard equipment)

- SpectroDirect (basic unit)
 - Power supply unit 100 - 240 V
 - Serial cable for connection to a PC
 - Magnetic pin (for Update)
 - 2 batteries (AA)
 - Manufacturers test certificate M
 - Warranty information
 - Instruction manual
- Order code: 71 20 00

SpectroDirect (advanced features)

- SpectroDirect in aluminium case
 - Power supply unit 100 - 240 V
 - Serial cable for connection to a PC
 - Magnetic pin (for Update)
 - 2 batteries (AA)
 - Energy station
 - Replacement lamp
 - 12 round vials with lids, 24 mm Ø
 - 10 round vials with lids, 16 mm Ø
 - 2 rectangular cells, 10 mm path length
 - 2 rectangular cells, 50 mm path length
 - Plastic stirring rod, 13 cm
 - Manufacturers test certificate M
 - Warranty information
 - Instruction manual
- Order code: 71 20 05

Applications

- Waste Water
- Drinking Water
- Industrial Process Water
- Science & Research
- Governmental and private Laboratories



We would be pleased to quote a ready to use spectrophotometer unit for the parameters and required accessories.

 Please see pages 88 onwards for reagents (order codes)



VIS / UV-VIS Spectrophotometer XD 7000 / XD 7500



➔ Please see pages 88 onwards for reagents (order codes)



The Tintometer® Group has a decade-long heritage of standing for in-house produced high quality reagents and instruments. With the XD series, the portfolio is supplemented by an equally first-class spectrophotometer that fulfils even the highest demands in water analysis.

The Lovibond® UV-VIS and VIS spectrophotometers XD 7500 and XD 7000 combine the latest reference beam technology with high user-friendliness and flexibility.

All from one provider

The XD instruments offer over 150 preprogrammed methods, which are based on the proven Lovibond® reagents. The combination of Photometer and Lovibond® reagents gives the user a complete system for immediate work input. There are no issues concerning with the implementation of reagent and instrument. This means that the user not only gets uncomplicated equipment for the working area at all times but also competence in after-sales service.

Quality at an affordable price

The outstanding price/performance ratio of the total systems XD 7000 and XD 7500 is maintained with the diverse range of Lovibond® reagents. So the user can be sure when purchasing the instrument to also have a low-priced solution for consumables in future.

Method selection made simple

The barcoded cuvette tests allow the user an immediate access to the respective method: the insertion of the 16 mm cuvettes into the light-shielded duct is sufficient.

Likewise for any other of the more than 150 parameters, the external barcode reader provides direct method selection. By adopting these barcodes into customer documents, such as work instructions, the correct operation is significantly streamlined.

Global deployment desirable

With its 24-language instrument software, a 27-language user manual and a methodology handbook written in 8 languages, the XD 7000/7500 series qualifies for global applicability.

Through the self-explanatory pictograms the methodology handbook gives the user a quick and reliable overview of the path to the measurement result.

Straightforward user guidance

The bright colour display and the easy-to-use menu navigation allow every user fast access to the instrument and its functions.

Diversity assured

In addition to the pre-installed Lovibond® methods the user also benefits from the various cuvette sizes of 16 and 24 mm round cuvettes, as well as 10, 20 and 50 mm rectangular cuvettes. These are all automatically recognised, without exception, and the user acquires a wide variety of methods.

The possibility of using a 13 mm cuvette by use of an adapter further enhances the method portfolio.

Always up to date

The latest software updates are always available for registration-free download on our website www.lovibond.com.

This allows users to keep their own XD instrument at the cutting edge with new methods, functions or languages.

Extensive features inclusive

The XD 7000/7500 series offers a comprehensive set of features for versatile use in the analysis of water-based solutions:

- Preprogrammed Lovibond® methods
- The creation of user-defined methods using multiple wavelengths.
- Measurement of transmission and absorption
- Spectral scan
- kinetic analysis

Well secured

Backup of own data is becoming increasingly important, not just for the maintenance of Good Laboratory Practice (GLP). For this purpose, the user can set up to 3 user levels: Administrator, user and guest (sometimes with password protection).

Guidelines and quality standards that call for such security will be handled in accordance with respective requirements.



Analytical quality assurance

In many application areas, beyond the GLP guidelines, reliable assurance of correct and precise measurement results is both a requirement and a challenge.

The XD 7000 and XD 7500 instruments meet this requirement with 3 selectable functions:

PCheck

The complete photometer is checked by means of the Verification Standard Kit, which can be ordered separately.

MCcheck

The photometer is checked in conjunction with the method.

The required standards are called application-related ValidCheck® multistandards and ValidCheck® single parameter standard solutions offered.

SCheck

The SCcheck checks whether the photometric determination of other ingredients in the sample have been disturbed.

Each of the mentioned check options includes the capability to define inspection time intervals, indicating verified results and issuing a test report.

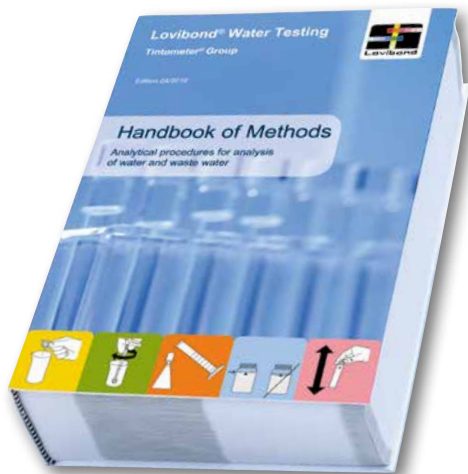
Spectrophotometer XD 7000
Order Code: 71307000

Spectrophotometer XD 7500
Order Code: 71307500

Delivery Content

- Spectrophotometer
- Set of 4 round vials with lid + zero vial XD7x00 (24mm)
- zero via 16 mm for XD 7000 / XD 7500
- 4 batteries AA
- Power supply unit 100 - 240 V / 50-60 Hz / 12 V DC Output
- Power cable
- Quickstart-Guide in 27 languages
- Full User-Manual in 8 languages (digital)
- Handbook of Methods (digital)
- Calibration record in shipping box

Technical data	XD 7000	XD 7500
Wavelength range	320 – 1100 nm (scan range)	190 – 1100 nm (scan range)
Light source	Tungsten-halogen-lamp	Xenon flash lamp (500 millionen flashes possible)
Optical system	grid monochromator with reference beam and beam splitter after exit slit	
Measurement	grid monochromator with reference beam and beam splitter after exit slit	
Suitable Vials	round: 13, 16 and 24 mm, rectangle: 10, 20 and 50 mm	
Automatic Tube Recognition	automatic recognition of 16 and 24 mm round tubes, 10,20,50 mm rectangular tubes	
Test recognition	via internal or external barcode reader (depending on the method)	
Dimensions (W x H x D)	422 x 195 x 323 mm	
Weight	approx. 4,5 kg	
Power supply	100 – 240 V, 50 / 60 Hz	
Display	7" high contrast colour graphic-display	
Protection class	IP30	
Keyboard	membrane keyboard	
Interfaces	1 x ethernet RJ45, 1 x USB A for external memory, keyboard, mouse, barcode-scanner and 1x USB B for PC and PCL compatible printer	
Spectral scope	4 nm	
Wavelength accuracy	± 1 nm on all Holmium peaks	
Wavelength reproducibility	better than 0,5 nm	
Photometric range	-3,3 - +3,3 Abs	
Photometric resolution	Abs.: 0,001 Transmission: 0,1%	
Photometric accuracy	0,003 Abs below 0,6 Abs / 0,5 % from 0,6 bis 2,0 Abs	
Photometric reproducibility	0,003 Abs below 0,6 Abs / 0,5 % from 0,6 bis 2,0 Abs	
Photometric linearity	<1% up to 2.0 Abs between 340 to 900 nm	
Scattered light at 340 and 408 nm	< 0,1% transmission	< 0,05% transmission
Drift	< 0.005 Abs per hour after 15 minutes heat up time	
Internal storage	approx. 5000 data sets (method, user ID, date, result), autostorage function / manual storage function	
Programmability	up to 100 user programs, 20 user profiles	



The Handbook of Methods

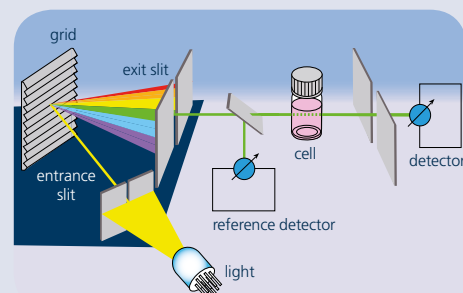
The 900 pages contain more than 160 Lovibond® test methods. Each method can also be selected directly by the XD instrument via barcode with the scanner. With basic chapters on water analysis, source and literature references, references to standards and explanations for possible errors, it is also a compact reference book for photometry - printed or digital.

The methods manual is currently available in eight languages.

Accessories

Item	Code
Replacement lamp for XD 7000	71310000
Transport case for XD Spectrophotometer	71310010
12 Volt Connection cable for XD Spectrophotometer	71310020
Barcode Scanner USB	71310030
Cleaning cloth for tubes	197635
USB-cable for PC-Connection, 3 m length	2444482
Batteries (AA), 4er pack	1950025
Round tube with lid, 12er-pack height 48 mm; diameter 24 mm	197620
Round tube with lid, 5er-pack height 48 mm; diameter 24 mm	197629
Round tube with lid, 10er-pack, 12er-pack height 90 mm; diameter 16 mm	197665
Tube stand for 6 vials 24 mm acrylic glass with laser engraving Lovibond	418951
Tube stand for 10 vials 16 mm acrylic glass with laser engraving Lovibond	418957
W100/OG/10 mm rectangle tube opt. glass	601040
W100/OG/20 mm rectangle tube opt. glass	601050
W100/OG/50 mm rectangle tube opt. glass	601070
W110/UV/10 mm rectangle tube quartz UV	661130
W110/UV/20 mm rectangle tube quartz UV	661140
W110/UV/50 mm rectangle tube quartz UV	661160
Secondary standard set VIS with DAkKS calibration	711160
Secondary standard set VIS with UV mit DAkKS calibration	711161
Automatic pipette 1-5 ml with stepless volume adjustment (digital)	419076
Pipette tips 1-5 ml, white (Pckg with 100 pc)	419066
Automatic pipette 0,1-1 ml with stepless volume adjustment (digital)	419077
Pipette tips 0,1-1 ml , blue (Pckg with 100 pc)	419073
Zero vial 16 mm for XD 7000/XD 7500	215661
Zero vial 24 mm for XD 7000/XD 7500	215662
Handbook of Methods, german	003864401
Handbook of Methods, english	003864402
Manuel des Méthodes, french	003864403
Manuale di Metodi, italian	003864404
Handbook de Métodos, spanish	003864405
Manual de Métodos, portuguese	003864406
Metotlar el Kitabı, turkish	003864407
Handbook of Methods, chinese (simplified)	003864408

i



The optical system

Using reference beam technology, the spectrophotometers achieve maximum accuracy in the visual and non-visual wavelength range.

The light source according to the model and consists of a tungsten-halogen lamp in the XD 7000, while the XD 7500 is equipped with a xenon flash lamp.

With an output of up to 500 million flashes, the UV light source is designed to last the life of the instrument and is a cost-effective replaceable part as opposed to the usual deuterium lamps.

By means of a grating monochromator and beam splitter behind the exit slit, the respective required wavelength is precisely demarcated and allows a wave length accuracy of +/- 1 nm.

The principle in detail

The light emitted by the light source falls through the entrance slit on the monochromator and is deflected by the grating situated towards the exit slit. This mechanism, along with the limitation after the exit slit, enables the selected wavelength to be accurately reproduced.

The semi-transparent mirror deflects the reference beam while allowing the light beam to pass through to the sample in the cuvette.

The photodiodes act as detectors and transmit these signals to the microprocessor. The result is calculated and issued as a value in the display.



XD Spectrophotometer in carrying case



ValidCheck Standard Solutions

Single standards

Item	Analyte	Analyte concentration
ValidCheck Chlorine	Cl ₂	1,5 mg/l Cl ₂
ValidCheck Fluoride	F ⁻	0,3 mg/l
ValidCheck Fluoride	F ⁻	1 mg/l
ValidCheck Sulfate	SO ₄ ²⁻	75 mg/l
ValidCheck Sulfate	SO ₄ ²⁻	500 mg/l
ValidCheck Copper	Cu	0,5 mg/l
ValidCheck Copper	Cu	2 mg/l
ValidCheck Manganese	Mn	0,3 mg/l
ValidCheck Potassium	K	10 mg/l
ValidCheck Nitrate	NO ₃ ³⁻	10 mg/l NO ₃ ³⁻
ValidCheck Nitrate	NO ₃ ³⁻	50 mg/l NO ₃ ³⁻
ValidCheck Nitrite	NO ₂ ²⁻ -N	0,1 mg/l
ValidCheck Nitrite	NO ₂ ²⁻ -N	0,4 mg/l
ValidCheck Total Nitrogen	N	50 mg/l
ValidCheck Phosphate	PO ₄ ³⁻ - P	0,3 mg/l
ValidCheck Phosphate	PO ₄ ³⁻ - P	1 mg/l
ValidCheck COD	COD / TOC	40 mg/l COD
ValidCheck COD	COD / TOC	120 mg/l COD
ValidCheck COD	COD / TOC	500 mg/l COD
ValidCheck COD	COD / TOC	5000 mg/l COD

Multistandards inclusive Stocking Solution

Item	Analyte	Analyte concentration of the standards
ValidCheck DW Anions	Cl ⁻ NO ₃ ³⁻ PO ₄ ³⁻ SO ₄ ²⁻	250 mg/l 50 mg/l 2 mg/l 500 mg/l
ValidCheck WW Influent Multi-Standard COD/TOC/NO ₃ -N/PO ₄ -P/TP	CSB/COD/ TOC NO ₃ ³⁻ -N PO ₄ ³⁻ -P	500 mg/l O ₂ 2 mg/l 10 mg/l
ValidCheck WW Effluent Multi-Standard COD/TOC/NO ₃ -N/PO ₄ -P/TP	CSB/COD/ TOC NO ₃ ³⁻ -N P (total)	40 mg/l O ₂ 10 mg/l 1 mg/l



ValidCheck standard solutions

Quality management of analytical methods is a fundamental prerequisite for reliable water analysis. With the new ValidCheck standard solutions, ready-to-use solutions are available to the user. The precisely adjusted concentrations are modified to each particular application case. The dilution is omitted.

With the ValidCheck Multistandards, the user can immediately check all important analysis methods of an application with one product: Anions and metals in the drinking water analysis or in the analysis of the wastewater treatment plant inflow and outflow. In addition, the Multistandards contain a stock solution, which enables the reliable determination of the influences of the sample matrix on the results.

Container sizes	Code
98,5 +1,5 ml	48105510
250 ml	48321225
250 ml	48321325
250 ml	48311325
250 ml	48311825
250 ml	48141325
250 ml	48141525
250 ml	48161425
250 ml	48191325
250 ml	48211325
250 ml	48211625
250 ml	48221225
250 ml	48221425
250 ml	48231725
250 ml	48241225
250 ml	48241425
250 ml	48371225
250 ml	48371425
250 ml	48371625
250 ml	48371825

new!

available in Q 4 !

Analyte concentration Stocking Solution	Container sizes	Code
1500 mg/l 250 mg/l NO ₃ ⁻ 10 mg/l 3000 mg/l	102 ml Stocking solution + 21 ml Stocking solution	48399312
2500 mg/l O ₂ 10 mg/l 50 mg/l	102 ml Stocking solution + 21 ml Stocking solution	48399712
200 mg/l O ₂ 50 mg/l 5 mg/l	102 ml Stocking solution + 21 ml Stocking solution	48399612



Reagents





Indicator Systems
Page 86



Reagents
Page 88-109



Indicator-Systems



Green chemistry

For decades, the Tintometer® Group has been known as a producer of reagents for water analysis, which are supplied under the brand name Lovibond®.

The wide range of applications requires different types of reagents.

Also, users tend to have personal preferences as to which dosing system to use.

Our broad product range covers blistered tablet reagents, powder reagents packed in aluminium foil and precise dosing liquid reagents in dropper bottles.

With all our reagents, we strive to keep the formulations as environmentally friendly as possible. Hazardous substances are – whenever possible – replaced by harmless and functionally identical substitutes.

Where the required chemistry of the detection method makes the use of these substances absolutely necessary, the concentration levels are lowered to the minimum rate, without compromising the accuracy of the analysis results.

For example, our reagents for Pool & Spa water testing are free from boric acid, which is still frequently being used as an additive in the industry. The European Union (EU) has classified boric acid as a dangerous substance.

The Lovibond® DPD No. 1 tablets are not only 100% free from boric acid, they also guarantee compliance with the buffering effect required by the standard.

This characteristic makes the tablet a leader in its field.



Tablet reagents

The reagent tablet is the most popular indicator system because it has several advantages. Its precise dosability, easy handling and very long shelf life make it a popular choice. Tablets can withstand almost all climatic conditions.

In part only thanks to the aluminium their blister packaging, from which they can be released at the press of a finger. Their compact form leaves almost no room for changes in the mixture due to external influences. Individually packaged, some tablets can be stored for up to 10 years. The weight of the tablet is fixed within very narrow limits. This allows a high dosing accuracy to be achieved. These solid tablets are designed for ease of use and to dissolve easily in the sample being tested.

Achieving a tablet substance which has both the solidity and the ease of dissolution needed for ease of use whilst having no undesired effects upon the analytical results requires many years of experience and a deep knowledge of the underlying chemistry.

You can therefore rely on over 130 years of experience in the production of reagent tablets by Lovibond®.



Liquid reagents

The use of liquid reagents has one decisive advantage: their speed, because there is no need to dissolve reagents in solid form. However, liquid reagents must be dosed exactly, for example, with a pipette. Warning: Incorrect handling can result in significant dosage errors. In addition, pipettes must be checked continuously to ensure that they remain accurate.

Because of these issues, the counting of droplets for simple dosing has therefore become established.

Here, too, there are external factors that can influence the result. This is because the drop size can change due to temperature, material, diameter of the dosing tip and composition of the reagent.

Liquid reagents have a significantly shorter shelf life than comparable products in solid form. The shelf life also deteriorates after opening. If the storage conditions are observed, Lovibond® DPD and Phenolred solutions have a shelf life of up to two years from the date of manufacture.



Powder reagents

Simply tear open the aluminium foil pack and add the contents to the water sample: Powder reagents can be used easily and quickly. This makes the Powder Packs a popular means of detection in water analysis in many countries.

Lovibond® Powder Packs are manufactured to the same high quality standards that have been tried and tested in tablet production for decades.



* 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 compatibility of these products for use in HACH® brand spectrophotometers or other instruments or systems.

Tintometer is appreciated worldwide for this.

The Lovibond® Powder Pack range is a valuable addition to the range of reagent systems. In addition, the range covers all known parameters - from aluminum to chlorine and to the sulfate.

Due to their chemical properties, Lovibond® Powder Packs can also be used in Hach® equipment.



Tube tests

It couldn't be easier:

The cuvettes already contain the essential indicators and reagents in the exact dosage required. Simply add the sample substance, insert it into the photometric measuring instrument and the result is available.

Anyone can carry out these simple tube tests. This makes highly sensitive and precise water tests exceptionally easy. The sample liquid discolours as soon as the reagent chemicals are added.

The photometer measures this discoloration and allows conclusions to be drawn about the concentration of the parameter being investigated. The process is standardized, saves time and everyone is able to perform it, with significant reductions in workload. The pre-dosed reagents eliminate the need to handle hazardous chemicals. This also increases work safety.

Up to six different measuring ranges are available for individual sample verifications. The round cuvettes are Ø 16 mm made of special optical glass as well as digestion or auxiliary reagents are supplied in a storage and shipping box. It contains 24 or 25 reaction cuvettes and up to 2 zero cuvettes for adjusting the photometer systems.

Environmental Protection

In many countries used cuvette tests are taken back. This is followed by professional disposal or recycling on the basis of the applicable environmental protection aspects.

Specifications and Certificate of Analysis

To underline the high quality standard of Lovibond® reagents, a specification is available for each reagent and a certificate of analysis for each lot (www.lovibond.com).



Detailed information see pages 114 - 119

Preparing samples for photometric measurements



Membrane filter set

Advantages

- removes turbid materials from samples
- differentiates between dissolved and total substances
- 0.45 µm mesh meets the requirements of the official German unitary procedure for water testing

To prevent the effects of light scatter, it must be ensured that all turbid materials are removed from the sample before photometric measurements are carried out. This can be achieved with the Lovibond® membrane filter set.

Where certain methods are employed (e.g., iron, manganese, CSB, etc.) a membrane filter set must be used to differentiate samples in terms of dissolved and total substances. The filter mesh size of 0.45 µm is in accordance with the official German unitary procedure for water testing.

Order code

(covers 25 x 0.45 µm membrane filters and two 20 ml syringes)

36 61 50





Reagents

Test	No. Methods	Range		Wave lengths λ / nm									Method
				MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	
Acid capacity K_{s4.3}	M20	0,1 - 4 mmol/l	-	610	610	610	610	-	615	615	615	615	Acid/Indicator ^{1, 2}
ADMI	M2530 M2531	2 - 100 mg/l 10 - 500 mg/l								400 bis 700	400 bis 700	400 bis 700	Tristimulus Colorimetry
Alkalinity-m	M30	5 - 200 mg/l	610	610	610	610	610	610	615	615	615	615	Acid/Indicator ^{1, 2, 5}
Alkalinity-m HR	M31	5 - 500 mg/l	-	-	610	610	610	610	615	615	615	615	Acid/Indicator ^{1, 2, 5}
Alkalinity-p	M35	5 - 300 mg/l	-	-	560	560	-	-	551	551	551	551	Acid/Indicator ^{1, 2, 5}
Aluminium VARIO	M50	0,01 - 0,25 mg/l	530	-	530	530	530	-	535	535	535	535	Eriochromcyanin R ²
Aluminium	M40	0,01 - 0,3 mg/l	530	-	530	530	530	-	535	535	535	535	Eriochrome cyanine R ²
Ammonia	M60	0,02 - 1 mg/l	610	-	610	610	610	-	676	676	676	676	Indophenole blue ^{2, 3}
Ammonia VARIO	M62	0,01 - 0,8 mg/l	660	-	660	660	-	-	655	655	655	655	Salicylate ²
Ammonia VARIO LR	M65	0,02 - 2,5 mg/l	-	-	660	660	-	-	655	655	655	655	Salicylate ²
Ammonia VARIO HR	M66	1 - 50 mg/l	-	-	660	660	-	-	655	655	655	655	Salicylate ²
Arsenic (III, V)	M68	0,02 - 0,6 mg/l	-	-	-	-	-	-	507	507	507	507	Silver diethyldithiocarbamate ¹
Biguanide (see PHMB)													

MSDS (Material Safety Data Sheets): www.lovibond.com

For other reagent quantities please see our current price list.

¹ Deutsche Einheitsverfahren zur Wasser-, Abwasser- und Schlamm- Untersuchung

² Standard Methods for the Examination of Water and Wastewater, 18th Edition; 1992

³ Photometrische Analyseverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart; 1989

⁴ Photometrische Analyse, Lange/Vejdelek, Verlag Chemie; 1980

⁵ Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®



Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Order code
24 mm ø		ALKA-M-PHOTOMETER	Tablet / 100	51 32 10 BT
50 mm □ 10 mm □		Pt-Co Units	no reagents required	
24 mm ø	CaCO ₃	ALKA-M-PHOTOMETER 	Tablet / 100	51 32 10 BT
24 mm ø	CaCO ₃	ALKA-M-HR-PHOTOMETER	Tablet / 100	51 32 40 BT
24 mm ø	CaCO ₃	ALKA-P-PHOTOMETER	Tablet / 100	51 32 30 BT
24 mm ø	Al	VARIO AluminuMECR/F20 VARIO AluminuMHexamine/F20 VARIO AluminuMECR Masking Reagent	Powder Pack / 100 Powder Pack / 100 Liquid reagent / 25 ml Set	53 50 00
24 mm ø	Al	ALUMINIUMNo. 1 ALUMINIUMNo. 2 Combi pack# ALUMINIUM No.1 / No.2 Combi pack# ALUMINIUM No.1 / No.2	Tablet / 100 Tablet / 100 each 100 each 250	51 54 60 BT 51 54 70 BT 51 76 01 BT 51 76 02 BT
24 mm ø	NH ₄ - N	AMmonIA No. 1 AMmonIA No. 2 Combi pack# AMmonIA No.1 / No.2 Combi pack# AMmonIA No.1 / No.2 Ammonia conditioning powder (for seawater)	Tablet / 100 Tablet / 100 each 100 each 250 Powder / 15 g / 50 Tests	51 25 80 BT 51 25 90 BT 51 76 11 BT 51 76 12 BT 46 01 70
24 mm ø	NH ₄ - N	VARIO Ammonia Salicylate F10 VARIO Ammonia Cyanurate F10	Powder Pack / 200 Powder Pack / 200 Set	53 55 00
16 mm ø	NH ₄ - N	VARIO Ammonia Salicylate F5 VARIO Ammonia Cyanurate F5 VARIO AMDiluent Reagent LR VARIO Deionised Water (for Zero)	Powder Pack / 50 Powder Pack / 50 Reaction tube / 50 Bottle, 100 ml Set (Tube test)	53 56 00
16 mm ø	NH ₄ - N	VARIO Ammonia Salicylate F5 VARIO Ammonia Cyanurate F5 VARIO AMDiluent Reagent HR VARIO Deionised Water (for Zero)	Powder Pack / 50 Powder Pack / 50 Reaction tube / 50 Bottle, 100 ml Set (Tube test)	53 56 50
20 mm □	As	Arsenic Reaction apparatus Set Erlenmeyer flask glass stopper absorption tube W 100 (tube, Optical Glass-OG, 20 mm layer depth)		370500 370501 370502 370503 601050

a) determination of free, combined and total

b) Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)

c) MultiDirect: Adapter is necessary for Vacu-vials® (Order code 19 20 75)

d) Spectroquant® is a Merck KGaA Trademark

e) alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity

f) additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine

g) Reagent recovers most insoluble iron oxides without digestion

h) additionally required for samples with hardness values above 300 mg/l CaCO₃

i) high range by dilution

j) Vacu-vials® is a Chemetrics Trademark

including stirring rod



Reagents

Reagents

Test	No. Methods	Range		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	Multidirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
				Wave lengths λ / nm									
Boron	M85	0,1 - 2 mg/l	-	-	-	430	430	-	-	450	450	450	Azomethine ³
Bromine	M80	0,05 - 13 mg/l	530	530	530	530	530	530	-	510	510	510	DPD ⁵
		0,05 - 6,5 mg/l	-	-	-	-	-	-	510	-	-		
	M79	0,05 - 1 mg/l	-	-	-	-	-	-	510	510	510		
	M78	0,1 - 3 mg/l	-	-	-	-	-	-	510	510	510		
Bromine Powder	M81	0,05 - 4,5 mg/l	-	-	530	530	-	-	-	510	510	510	DPD ^{1, 2}
Cadmium (Cd ²⁺)	M87	0,025 - 0,75 mg/l	-	-	-	-	-	-	525	525	525	525	Cadion
Chlorine ^{a)}	M100	0,01 - 6 mg/l	530	530	530	530	530	530	-	510	510	510	DPD ^{1, 2}
		0,02 - 3 mg/l	-	-	-	-	-	-	510	-	-		
	M99	0,02 - 0,5 mg/l	-	-	-	-	-	-	510	510	510		
	M98	0,1 - 6 mg/l	-	-	-	-	-	-	510	510	510		
Chlorine HR (DPD) ^{a)}	M103	0,1 - 10 mg/l	530	530	530	530	530	530	-	-	-	-	DPD ^{1, 2}
	M104	0,1 - 10 mg/l	-	-	-	-	-	-	510	510	510	510	
Chlorine ^{a)}	M101	0,02 - 4 mg/l	530	530	530	530	530	-	-	-	-	-	DPD ^{1, 2}
		0,02 - 3 mg/l	-	-	-	-	-	-	510	510	510	510	
Chlorine Powder MR	M113	0,02 - 3,5 mg/l	530	-	530	530	-	-	510	510	510	510	DPD ^{1, 2}
Chlorine Powder ^{a)}	M110	0,02 - 2 mg/l	530	-	530	530	530	-	510	510	510	510	DPD ^{1, 2}
	M111	0,1 - 8 mg/l	530	-	530	-	530	-	-	-	-	-	

MSDS (Material Safety Data Sheets): www.lovibond.com

For other reagent quantities please see our current price list.

¹ Deutsche Einheitsverfahren zur Wasser-, Abwasser- und Schlamm- Untersuchung

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³ Photometrische Analysenverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart; 1989

⁴ Photometrische Analyse, Lange/Vejdelek, Verlag Chemie; 1980

⁵ Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®

Tube	Display	Reagent	Form of reagent/Quantity	Order code
24 mm ø	B	BORON No. 1	Tablet / 100	51 57 90BT
		BORON No. 2	Tablet / 100	51 58 00BT
		Combi pack# BORON No.1 / No.2	each 100	51 76 81BT
		Combi pack# BORON No.1 / No.2	each 200	51 76 82BT
24 mm ø	Br	in absence of Chlorine: DPD No.1		
24 mm ø		Bromine beside Chlorine: DPD No.1, Glycine		
50 mm □		differentiated bromine determination:		
10 mm □		DPD No.1, DPD No.3, DPD Nitrite		
		DPD No. 1 	Tablet / 100	51 10 50 BT
		GLYCINE ^{f)}	Tablet / 100	51 21 70 BT
		DPD No. 3 	Tablet / 100	51 10 80 BT
		DPD Nitrite	Tablet / 250	50 26 91
		Combi pack# DPD No.1 / GLYCINE	each 100	51 77 31 BT
		Combi pack# DPD No.1 / GLYCINE	each 250	51 77 32 BT
		Combi pack# DPD No.1 / No.3 	each 100	51 77 11 BT
		Combi pack# DPD No.1 / No.3 	each 250	51 77 12 BT
		DPD No. 1 HIGH CALCIUM ^{e)} 	Tablet / 100	51 57 40 BT
		DPD No. 3 HIGH CALCIUM ^{e)} 	Tablet / 100	51 57 30 BT
		Combi pack# DPD No.1 / No.3 HIGH CALCIUM ^{e)} 	each 100	51 77 81 BT
		Combi pack# DPD No.1 / No.3 HIGH CALCIUM ^{e)} 	each 250	51 77 82 BT
24 mm ø	Br	Chlorine TOTAL-DPD/F10	Powder Pack / 100	53 01 20
16 mm ø	Cd	Spectroquant® 1.14834.0001 ^{d)}	Tube test / 25	42 07 50
24 mm ø	Cl ₂	DPD No. 1 	Tablet / 100	51 10 50 BT
24 mm ø		DPD No. 3 	Tablet / 100	51 10 80 BT
50 mm □		Combi pack# DPD No.1 / No.3 	each 100	51 77 11 BT
10 mm □		Combi pack# DPD No.1 / No.3 	each 250	51 77 12 BT
		DPD No. 1 HIGH CALCIUM ^{e)} 	Tablet / 100	51 57 40 BT
		DPD No. 3 HIGH CALCIUM ^{e)} 	Tablet / 100	51 57 30 BT
		Combi pack# DPD No.1 / No.3 HIGH CALCIUM ^{e)} 	each 100	51 77 81 BT
		Combi pack# DPD No.1 / No.3 HIGH CALCIUM ^{e)} 	each 250	51 77 82 BT
24 mm ø	Cl ₂	DPD No. 1 HR 	Tablet / 100	51 15 00 BT
10 mm □		DPD No. 3 HR 	Tablet / 100	51 15 90 BT
24 mm ø	Cl ₂	DPD 1 Buffer solution	Liquid reagent / 15 ml	47 10 10
24 mm ø		DPD 1 Reagent solution	Liquid reagent / 15 ml	47 10 20
		DPD 3 Solution	Liquid reagent / 15 ml	47 10 30
		Set		47 10 56
24 mm ø	Cl ₂	VARIO Chlorine FREE-DPD/F10 	Powder Pack / 100	53 01 80
		VARIO Chlorine TOTAL-DPD/F10 	Powder Pack / 100	53 01 90
24 mm ø	Cl ₂	Chlorine FREE-DPD/F10 	Powder Pack / 100	53 01 00
10 mm □		Chlorine TOTAL-DPD/F10 	Powder Pack / 100	53 01 20
Multivial				

^{a)} determination of free, combined and total

^{b)} Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)

^{c)} MultiDirect: Adapter is necessary for Vacu-vials® (Order code 19 20 75)

^{d)} Spectroquant® is a Merck KGaA Trademark

^{e)} alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity

^{f)} additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine

^{g)} Reagent recovers most insoluble iron oxides without digestion

^{h)} additionally required for samples with hardness values above 300 mg/l CaCO₃

ⁱ⁾ high range by dilution

^{j)} Vacu-vials® is a Chemetrics Trademark

including stirring rod



Reagents

Test	No. Methods	Range		Wave lengths λ / nm									Method
				MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	
Chlorine HR (KI)	M105	5 - 200 mg/l	530	-	530	530	-	-	470	470	470		KI / Acid ⁵
Chlorine dioxide	M120	0,02 - 11 mg/l	530	530	530	530	530	-	-	510	510		DPD/Glycine ^{1,2}
		0,05 - 2,5 mg/l	-	-	-	-	-	-	510	-	-		
	M119	0,05 - 1 mg/l	-	-	-	-	-	-	510	510	510		
Chlorine dioxide Powder	M122	0,04 - 3,8 mg/l	530	-	530	530	-	-	-	510	510		DPD ^{1,2}
Chloride	M90	0,5 - 25 mg/l	530	-	530	530	-	-	450	450	450		Silver nitrate/turbidity
	M93	5 - 250 mg/l ¹⁾	530	-	-	-	-	-	-	-	-		
Chloride	M91	5 - 60 mg/l	-	-	-	-	-	-	455	455	455		Iron (III)-thiocyanate ⁴
Chloride	M92	0,5 - 20 mg/l	430	-	430	-	-	-	-	430	430		Mercury thiocyanate / Iron nitrate
Chrome (III, VI) ^{b)}	M124	0,005 - 0,5 mg/l	-	-	-	-	-	-	542	542	542		1,5-Diphenylcarbozide ^{1,2}
	M125	0,02 - 2 mg/l	-	-	530	530	-	-	542	542	542		
COD LR (ISO 15705:2002) ^{b)}	M130	3 - 150 mg/l	430	430	430	430	-	-	443	443	443		Dichromate / H ₂ SO ₄ ^{1,2}
COD LMR (ISO 15705:2002) ^{b)}	M133	15 - 300 mg/l	430	430	430	430	-	-	445	445	445		Dichromate / H ₂ SO ₄ ^{1,2}
COD MR (ISO 15705:2002) ^{b)}	M131	20 - 1500 mg/l	610	610	610	610	-	-	596	596	596		Dichromate / H ₂ SO ₄ ^{1,2}
COD HR ^{b)}	M132	200 - 15000 mg/l	610	610	610	610	-	-	602	602	602		Dichromate / H ₂ SO ₄ ^{1,2}

MSDS (Material Safety Data Sheets): www.lovibond.com

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⁵ Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®



Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Order code
16 mm ø	Cl ₂	ACIDIFYING GP CHLORINE HR (KI) Combi pack# CHLORINE HR (KI)/ACIDIFYING GP Combi pack# CHLORINE HR (KI)/ACIDIFYING GP	Tablet / 100 Tablet / 100 each 100 each 250	51 54 80 BT 51 30 00 BT 51 77 21 BT 51 77 22 BT
24 mm ø 24 mm ø 50 mm □	ClO ₂	in absence of chlorine: DPD No.1 Chlorine dioxide beside Chlorine: DPD No.1, Glycine, DPD No.3 DPD No. 1  GLYCINE ^{f)} DPD No. 3  Combi pack# DPD No.1 / GLYCINE Combi pack# DPD No.1 / GLYCINE Combi pack# DPD No.1 / No.3  Combi pack# DPD No.1 / No.3  DPD No. 1 HIGH CALCIUM ^{e)}  DPD No. 3 HIGH CALCIUM ^{e)}  Combi pack# DPD No.1 / No.3 HIGH CALCIUM ^{e)}  Combi pack# DPD No.1 / No.3 HIGH CALCIUM ^{e)} 	Tablet / 100 Tablet / 100 Tablet / 100 each 100 each 250 each 100 each 250 Tablet / 100 Tablet / 100 each 100 each 250	51 10 50 BT 51 21 70 BT 51 10 80 BT 51 77 31 BT 51 77 32 BT 51 77 11 BT 51 77 12 BT 51 57 40 BT 51 57 30 BT 51 77 81 BT 51 77 82 BT
	ClO ₂	Chlorine FREE-DPD/F10  GLYCINE ^{f)}	Powder Pack / 100 Tablet / 100	53 01 00 51 21 70 BT
24 mm ø	Cl ⁻	CHLORIDE T1 CHLORIDE T2 Combi pack# CHLORIDE T1 / T2 Combi pack# CHLORIDE T1 / T2	Tablet / 100 Tablet / 100 each 100 each 250	51 59 10 BT 51 59 20 BT 51 77 41 BT 51 77 42 BT
24 mm ø	Cl ⁻	Chloride-51 / Chloride-52	Reagent test (Liquid reagent) approx. 50-75 Tests	2 41 90 31
24 mm ø	Cl ⁻	KS251 (Chloride Reagent A) KS253 (Chloride Reagent B)	Liquid reagent / 65 ml Liquid reagent / 65 ml Set	56L025165 56L025365 56R018490
50 mm □ 16 mm ø	Cr	PERSULF. RTG FOR CR ChromiuMHexavalent	Powder Pack / 100 Powder Pack /100	53 73 00 53 73 10
16 mm ø	O ₂	Reaction tube 0-150 mg/l Reaction tube 0-150 mg/l, mercury free* *without chloride removal	Tube test / 25 Tube test / 25	2 42 07 20 with Barcode 2 42 07 10 with Barcode
16 mm ø	O ₂	Reaction tube 15-300 mg/l	Tube test / 25	2 42 31 20 with Barcode
16 mm ø	O ₂	Reaction tube 0-1500 mg/l Reaction tube 0-1500 mg/l, mercury free* *without chloride removal	Tube test / 25 Tube test / 25	2 42 07 21 with Barcode 2 42 07 11 with Barcode
16 mm ø	O ₂	Reaction tube 0-15000 mg/l Reaction tube 0-15000 mg/l, mercury free* *without chloride removal	Tube test / 25 Tube test / 25	2 42 07 22 with Barcode 2 42 07 12 with Barcode

^{a)} determination of free, combined and total

^{b)} Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)

^{c)} MultiDirect: Adapter is necessary for Vacu-vials® (Order code 19 20 75)

^{d)} Spectroquant® is a Merck KGaA Trademark

^{e)} alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity

^{f)} additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine

^{g)} Reagent recovers most insoluble iron oxides without digestion

^{h)} additionally required for samples with hardness values above 300 mg/l CaCO₃

ⁱ⁾ high range by dilution

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including stirring rod



Reagents

Reagents

Test	No. Methods	Range	Wave lengths λ / nm										Method
			MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500		
Copper ^{a)}	M150	0,05 - 5 mg/l	560	560	560	560	560	560	559	559	559	Biquinoline ⁴	
		0,5 - 5 mg/l	530	-	-	-	-	-	-	-	-		
	M149	0,05 - 1 mg/l	-	-	-	-	-	-	559	559	559		
Copper ^{a)}	M151	0,05 - 4 mg/l	-	-	560	-	-	-	-	560	560	Bicinchoninate	
Copper, free VARIO	M153	0,05 - 5 mg/l	560	-	560	560	560	-	560	560	560	Bicinchoninate	
Cyanide	M157	0,01 - 0,5 mg/l	-	-	580	580	-	-	585	585	585	Pyridine-barbituric acid ¹	
	M156	0,005 - 0,2 mg/l	-	-	-	-	-	-	585	585	585		
Cyanuric acid	M160	10 - 160 mg/l	530	530	530	530	530	530	530	530	530	Melamine	
Cyanuric acid HR	M161	20 - 200 mg/l	-	-	530	530	530	530	530	530	530	Melamine	
DEHA	M165	20 - 500 µg/l	-	-	560	560	-	-	562	562	562	PPST ³	
DEHA VARIO	M167	20 - 500 µg/l	560	-	560	560	-	-	562	562	562	PPST ³	
Fluoresceine (only MD 640)	M510	10 - 400 ppb	-	-	> 395	-	-	-	-	-	-	Fluorescence	
Fluoride	M170	0,05 - 2 mg/l	580	-	580	580	-	-	580	580	580	SPADNS ²	
Formaldehyde	M175	1 - 5 mg/l	-	-	-	-	-	-	585	585	585	H ₂ SO ₄ / Chromotropic acid	
	M176	0,02 - 1 mg/l	-	-	-	-	-	-	585	585	585		
Formaldehyde	M177	0,1 - 5 mg/l	-	-	-	-	-	-	575	575	575	H ₂ SO ₄ / Chromotropic acid	
Hardness, calcium	M191	20 - 500 mg/l	560	560	560	560	560	560	-	560	560	Murexide ⁴	
Hardness, total	M200	2 - 50 mg/l	560	-	560	560	560	-	571	571	571	Metallphthalein ³	
	M201	20 - 500 mg/l ¹⁾	560	-	560	560	560	-	571	571	571		
Hazen (Pt-Co-Units ; APHA)	M204	10 - 500 mg/l	430	-	430	430	-	-	-	455	455	Direct reading ^{1, 2}	
	M203	10 - 500 mg/l	-	-	-	-	-	-	455	455	455		
Hydrazine	M205	0,05 - 0,5 mg/l	430	-	430	430	-	-	455	455	455	Dimethylamino-benzaldehyd ³	

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⁵ Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®



Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Order code
24 mm ø 24 mm ø 50 mm ø	Cu	COPPER No. 1  COPPER No. 2 Combi pack# COPPER No.1 / No.2 Combi pack# COPPER No.1 / No.2	Tablet / 100 Tablet / 100 each 100 each 250	51 35 50 BT 51 35 60 BT 51 76 91 BT 51 76 92 BT
24 mm ø	Cu	KS240 (Coppercol Reagent 1) KS241 (Coppercol Reagent 2) KS242 (Coppercol Reagent 3) COPPER No.2 (Cu total)	Liquid reagent / 30 ml Liquid reagent / 30 ml Powder / 10 g Tablet / 100 Set	56L024030 56L024130 56L024210 51 35 60 BT 56R023355
24 mm ø	Cu	Vario Cu 1 F10	Powder Pack / 100	53 03 00
24 mm ø 50 mm □	CN	Cyanide-11 / Cyanide-12 / Cyanide-13	Reagent test (Powder, Liquid reagent) / 200 Tests	2 41 88 75
24 mm ø	Cys	CyA-TEST 	Tablet / 100	51 13 70 BT
24 mm ø	Cys	CyA HR-TEST 	Tablet / 100	51 14 30 BT
24 mm ø	DEHA	DEHA-Liquid DEHA	Liquid reagent / 100 ml Tablet / 100	46 11 81 51 32 20 BT
24 mm ø	DEHA	VARIO OXYSCAV 1 RGT VARIO DEHA 2 RGT	Powder Pack / 200 Solution / 100 ml Set	53 60 00
24 mm ø	Fluoresceine	no reagents required		
24 mm ø	F	SPADNS-Reagent Fluoride Standard Reagent solution and standard required	Liquid reagent / 250 ml Liquid reagent / 500 ml Solution / 30 ml	46 74 81 46 74 82 20 56 30
10 mm □ 50 mm □	HCHO	Spectroquant® 1.14678.0001 ^{d)}	Reagent test / ca. 50-75 Tests	42 07 51
16 mm ø	HCHO	Spectroquant® 1.14500.0001 ^{d)}	Tube test / 25	42 07 52
24 mm ø	CaCO ₃	Combi pack# CALCIO H No.1 / No.2  Combi pack# CALCIO H No.1 / No.2 	each 100 each 250	51 77 61 BT 51 77 62 BT
24 mm ø	CaCO ₃	HARDCHECK P	Tablet / 100 Tablet / 250	51 56 60 BT 51 56 61 BT
24 mm ø 50 mm □	Pt-Co-Units	no reagents required	-	-
24 mm ø	N ₂ H ₄	Hydrazine Test Powder measuring spoon	Powder / 30 g	46 29 10 38 49 30

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ⁱ⁾ high range by dilution

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including stirring rod



Reagents

Reagents

Test	No. Methods	Range			Wave lengths λ / nm								Method
					MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	
Hydrazine	M206	0,01 - 0,6 mg/l 5 - 600 µg/l	- -	- -	430 -	430 -	- -	- -	- 455	- 455	- 455	Dimethylamino-benzaldehyd ³	
Hydrazine ^{c)}	M207	0,01 - 0,7 mg/l	-	-	430	430	-	-	-	430	430	PDMAb	
Hydrogen peroxide	M210	0,03 - 3 mg/l	-	-	530	530	530	-	-	510	510	DPD/Catalysator ⁵	
	M209	0,03 - 1,5 mg/l	-	-	-	-	-	-	510	-	-		
		0,01 - 0,5 mg/l	-	-	-	-	-	-	510	510	510		
Hydrogen peroxide	M213	1 - 50 mg/l	-	430	430	430	-	-	-	430	430	Peroxtitanium acid	
	M214	40 - 500 mg/l ⁱ⁾	-	530	530	530	530	-	-	530	530		
Iodine	M215	0,05 - 3,6 mg/l	-	-	530	530	530	-	510	510	510	DPD ⁵	
Iron (II, III) soluble	M220	0,02 - 1 mg/l	560	560	560	560	560	560	-	562	562	PPST ³	
	M219	0,01 - 0,5 mg/l	-	-	-	-	-	-	562	562	562		
	M218	0,05 - 1 mg/l	-	-	-	-	-	-	562	562	562		
Iron VARIO (II, III) soluble	M222	0,02 - 3 mg/l	530	-	530	530	-	-	-	510	510	1,10-Phenanthrolin ²	
		0,01 - 1,5 mg/l	-	-	-	-	-	-	510	510	510		
Iron VARIO, gesamt ^{g)}	M223	0,02 - 1,8 mg/l	580	-	580	580	-	-	-	590	590	TPTZ ^{g)}	
		0,1 - 1,8 mg/l	-	-	-	-	-	-	590	-	-		
Iron LR (Fe ^{2+/3+})	M225	0,03 - 2,0 mg/l	560	-	560	-	-	-	-	560	560	Ferrozine / Thioglycolate	
Iron LR 2 (Fe ²⁺ und Fe ³⁺)	M226	0,03 - 2,0 mg/l	-	-	560	-	-	-	-	560	560	Ferrozine / Thioglycolate	
Iron HR	M227	0,1 - 10 mg/l	-	-	530	-	-	-	-	530	530	Thioglycolate	
Iron, total, Fe in Mo	M224	0,01 - 1,8 mg/l	580	-	580	-	-	-	-	580	580	Fe in Mo	

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Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Order code
24 mm ø	N ₂ H ₄	VARIO Hydra 2 Reagent	Solution / 100 ml	53 12 00
24 mm ø	N ₂ H ₄	Vacu-vial® [Ⓜ]	Test Kit / 30 Adapter for Vacu-vials® [Ⓜ]	38 04 70 19 20 75
24 mm ø 24 mm ø 50 mm □	H ₂ O ₂	HYDROGENPEROXIDE LR	Tablet / 100	51 23 80 BT
24 mm ø	H ₂ O ₂	H ₂ O ₂ Reagent solution	Liquid reagent / 15 ml	42 49 91
24 mm ø	I	DPD No. 1 	Tablet / 100	51 10 50 BT
24 mm ø 50 mm □ 10 mm □	Fe	IRON LR (Fe ²⁺ und Fe ³⁺) IRON (II) LR (Fe ²⁺)	Tablet / 100 Tablet / 100	51 53 70 BT 51 54 20 BT
24 mm ø	Fe	VARIO Ferro F10	Powder Pack / 100	53 05 60
24 mm ø	Fe	VARIO IRON TPTZ F10	Powder Pack / 100	53 05 50
24 mm ø	Fe	KS61 (Ferrozine / Thioglycolate, FE5) KS63 (Thioglycolate Reagenz, FE6) digestion: KP962 (Ammonium Persulphate Powder) KS135 (Phenolphthalein / Indicator) KS144 (Calcium Hardness Buffer)	Liquid reagent / 65 ml Liquid reagent / 65 ml Powder Liquid reagent / 65 ml Liquid reagent / 65 ml	56L006165 56L006365 56P096240 56L013565 56L014465
24 mm ø	Fe	KS60 FE1 (Acetate Buffer) KS63 FE6 (Thioglycolate Reagent) KS65 FE7 (Ferrozine Reagent) digestion: KP962 (Ammonium Persulphate Powder) KS135 (Phenolphthalein / Indicator) KS144 (Calcium Hardness Buffer)	Liquid reagent / 65 ml Liquid reagent / 65 ml Liquid reagent / 65 ml Set Powder Liquid reagent / 65 ml Liquid reagent / 65 ml	56L006065 56L006365 56L006565 56R023490 56P096240 56L013565 56L014465
24 mm ø	Fe	KS160 TH2 FE8 (Total Hardness Buffer) KS63 FE6 (Thioglycolate Reagent) digestion: KP962 (Ammonium Persulphate Powder) KS135 (Phenolphthalein / Indicator) KS144 (Calcium Hardness Buffer)	Liquid reagent / 65 ml Liquid reagent / 65 ml Set Powder Liquid reagent / 65 ml Liquid reagent / 65 ml	56L016065 56L006365 56R023590 56P096240 56L013565 56L014465
24 mm ø	Fe	VARIO (Fe in Mo) Rgt 1 VARIO (Fe in Mo) Rgt 2	Powder Pack / 100 Powder Pack / 100 Set	53 03 10 53 03 20 53 60 10

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ⁱ⁾ high range by dilution

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[#] including stirring rod



Reagents

Reagents

Test	No. Methods	Range		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
				Wave lengths λ / nm									
Lead (Pb ²⁺)	M232	0,1 - 5 mg/l	-	-	-	-	-	-	520	520	520		4-(2-Pyridylazo)-resorcine
Lead (Pb ²⁺)	M234/ M235	0,1 - 5 mg/l	-	-	-	-	-	-	515	515	515		4-(2-Pyridylazo)-resorcine
Manganese	M240	0,2 - 4 mg/l	530	-	530	530	-	-	450	450	450		Formaldehyde
Manganese VARIO LR	M242	0,01 - 0,7 mg/l	560	-	560	560	-	-	558	558	558		PAN
Manganese VARIO HR	M243	0,1 - 18 mg/l	530	-	530	530	-	-	525	525	525		Periodate oxidation ²
Manganese	M245	0,05 - 5 mg/l	-	-	430	-	-	-	-	450	450		Formaldehyde
Molybdate / Molybdenum	M250	1 - 50 mg/l 1 - 30 mg/l 0,6 - 30 mg/l	- - 430	- - -	430 - -	430 - -	- - -	- - -	- 366 -	366 - -	366 - -		Thioglycolate ⁴
Molybdate / Molybdenum VARIO LR	M251	0,05 - 5 mg/l 0,03 - 3 mg/l	- 610	- -	610 610	610 610	- -	- -	610 610	610 610	610 610		Mercaptoacetic acid
Molybdate / Molybdenum VARIO HR	M252	0,5 - 66 mg/l 0,3 - 40 mg/l	- 430	- -	430 430	430 430	- -	- -	420 420	420 420	420 420		Mercaptoacetic acid
Molybdate / Molybdenum HR	M254	1 - 100 mg/l 0,6 - 60 mg/l	- 430	- -	430 430	- -	- -	- -	- -	430 430	430 430		Thioglycolate ⁴
Nickel	M255 M256	0,02 - 1 mg/l 0,2 - 7 mg/l	- -	- -	- 430	- 430	- -	- -	443 443	443 443	443 443		Dimethylglyoxime ^{2, 3}
Nitrate	M260	0,08 - 1 mg/l 0,35 - 4,4 mg/l	- -	- -	530 530	- -	- -	- -	- -	530 530	530 530		Zinc reduction / NED

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Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Order code
10 mm □	Pb	Spectroquant® 1.09717.0001 ^{d)}	Reagent test / 50 Tests	42 07 53
16 mm ø	Pb	Spectroquant® 1.14833.0001 ^{d)}	Tube test / 25	42 07 54
24 mm ø	Mn	MANGANESE LR 1 MANGANESE LR 2 Combi pack# MANGANESE LR 1 / LR 2 Combi pack# MANGANESE LR 1 / LR 2	Tablet / 100 Tablet / 100 each 100 each 250	51 60 80 BT 51 60 90 BT 51 76 21 BT 51 76 22 BT
24 mm ø	Mn	VARIO Ascorbic Acid VARIO Alkaline-Cyanide VARIO PAN Indicator VARIO Rochelle Salt Solution ^{h)}	Powder Pack / 100 Liquid reagent / 60 ml Liquid reagent / 60 ml Set 30 ml	53 50 90 53 06 40
24 mm ø	Mn	VARIO Manganese Citrate Buffer F10 VARIO Sodiumperiodate F10	Powder Pack / 100 Powder Pack / 100 Set	53 51 00
24 mm ø	Mn	KS265 Manganese Reagent A KS266 Manganese Reagent B KS267 Manganese Reagent C	Liquid reagent / 30 ml Liquid reagent / 30 ml Liquid reagent / 30 ml Set	56L026530 56L026630 56L030430 56R024055
24 mm ø	MoO ₄ MoO ₄ Mo	MOLYBDATE No.1 HR MOLYBDATE No.2 HR Combi pack# MOLYBDATE No.1 HR / No.2 HR Combi pack# MOLYBDATE No.1 HR / No.2 HR	Tablet / 100 Tablet / 100 each 100 each 250	51 30 60 BT 51 30 70 BT 51 76 31 BT 51 76 32 BT
24 mm ø	MoO ₄ Mo	VARIO MolybdenuM1 LR F20 VARIO MolybdenuM2 LR required accessory: mixing cylinder (not included)	Powder Pack / 100 Liquid reagent/ 50 ml Set	53 54 50
24 mm ø	MoO ₄ Mo	VARIO MolybdenuMHR1 F10 VARIO MolybdenuMHR2 F10 VARIO MolybdenuMHR3 F10	Powder Pack / 100 Powder Pack / 100 Powder Pack / 100 Set	53 53 00
24 mm ø	MoO ₄ Mo	KS63 (Thioglycolate Reagent)	Liquid reagent / 65 ml	56L006365
50 mm □ 24 mm ø	Ni	Nickel-51, Nickel-52	Reagent test (Powder, Liquid reagent) / 50 Tests	2 41 90 33
24 mm ø	NO ₃ - N NO ₃	NITRATE TEST Powder NITRATE TEST Tablet NITRITE LR Nitrate test tube	Powder / 15 g Tablet / 100 Tablet / 100	46 52 30 50 28 10 51 23 10BT 36 62 20

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Reagents

Reagents

Test	No. Methods	Range		Wave lengths λ / nm										Method
				MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500		
Nitrate VARIO	M265	1 - 30 mg/l	-	-	-	430	430	-	-	410	410	410	Chromotropic acid	
		4,4 - 132 mg/l	-	-	430	430	-	-	410	410	410			
Nitrate DMP LR	M267	0,5 - 14 mg/l	-	-	-	-	-	-	-	340	340	340	2,6-Dimethylphenole ³	
		2,2 - 62 mg/l	-	-	-	-	-	-	-	340	340	340		
Nitrate DMP HR available in Q4!	M268	1,2 - 35 mg/l	-	-	-	-	-	-	-	340	340	340	2,6-Dimethylphenole ³	
		5,3 - 154 mg/l	-	-	-	-	-	-	-	340	340	340		
Nitrite	M270	0,01 - 0,5 mg/l	-	-	560	560	-	-	545	540	540	N-(1-Naphthyl)-ethylenediamine ^{2,3}		
		0,03 - 0,16 mg/l	-	-	560	560	-	-	545	540	540			
Nitrite LR	M275	0,03 - 0,6 mg/l	-	-	-	-	-	-	545	545	545	Sulfanil/Naphthylamine ¹		
		0,1 - 2 mg/l	-	-	-	-	-	-	545	545	545			
Nitrite HR	M276	0,3 - 3 mg/l	-	-	-	-	-	-	545	545	545	Sulfanil/Naphthylamine ¹		
		1 - 10 mg/l	-	-	-	-	-	-	545	545	545			
Nitrite LR VARIO	M272	0,01 - 0,3 mg/l	-	-	530	530	-	-	507	507	507	Diazotation		
		0,03 - 1 mg/l	-	-	530	530	-	-	507	507	507			
Nitrogen-total ^{b)} LR DMP HR	M283	0,5 - 14 mg/l	-	-	-	-	-	-	340	340	340	2,6-Dimethylphenole ^{2,3}		
	M284	5 - 140 mg/l ¹⁾	-	-	-	-	-	-	340	340	340			
Nitrogen-total DMP LR	M283	0,5 - 14 mg/l	-	-	-	-	-	-	340	340	340	2,6-Dimethylphenole ^{2,3}		
Nitrogen-total DMP HR	M284	5 - 140 mg/l	-	-	-	-	-	-	340	340	340	2,6-Dimethylphenole ^{2,3}		
Nitrogen VARIO total LR ^{b)}	M280	0,5 - 25 mg/l	-	-	430	430	-	-	410	410	410	Persulphate-digestion method		
Nitrogen VARIO, total HR ^{b)}	M281	5 - 150 mg/l	-	-	430	430	-	-	410	410	410	Persulphate-digestion method		
Oxygen, active	M290	0,1 - 10 mg/l	-	-	530	530	530	-	-	510	510	DPD		
Oxygen, dissolved	M292	10 - 800 µg/l	530	-	530	530	-	-	-	-	-	Rodazin D TM		
		10 - 1100 µg/l	-	-	-	-	-	-	-	547	547			

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⁵ Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®

Tube	Display	Reagent	Form of reagent/Quantity	Order code
16 mm ø	NO ₃ - N NO ₃	VARIO Nitrate Chromotropic VARIO Nitra X Reagent tube VARIO Deionised Water (for Zero)	Powder Pack / 50 Reaction tube / 50 Bottle, 100 ml Set (Tube test)	53 55 80
16 mm ø	NO ₃ - N NO ₃	Reaction tube, Nitrate-111	Tube test / 24	2 42 07 02 without Barcode 2 42 33 40 with Barcode
16 mm ø	NO ₃ - N NO ₃	Reaction tube, Nitrate-111	Tube test / 24	2 42 33 70 with Barcode
24 mm ø	NO ₂ - N NO ₂	NITRITE LR	Tablet / 100	51 23 10 BT
16 mm ø	NO ₂ - N NO ₂	Reaction tube, Nitrite-101	Tube test / 24	2 41 90 18 without Barcode 2 42 34 20 with Barcode
16 mm ø	NO ₂ - N NO ₂	Reaction tube, Nitrite HR	Tube test / 24	2 42 34 70 with Barcode
24 mm ø	NO ₂ - N NO ₂	VARIO Nitri 3	Powder Pack / 100	53 09 80
16 mm ø	N	Digestion reagent, Compensation reagent, Nitrate-111	Tube test / 24	2 42 07 03 without Barcode
16 mm ø	N	Digestion reagent, Compensation reagent, Nitrate-111	Tube test / 24	2 42 35 40 with Barcode
16 mm ø	N	Digestion reagent, Compensation reagent, Nitrate-111	Tube test / 24	2 42 35 70 with Barcode
16 mm ø	N	VARIO TN HYDROX. LR Tubes VARIO PERSULFATE Reagent VARIO TN Reagent A VARIO TN Reagent B VARIO TN ACID LR/HR Tubes VARIO Deionised Water (for Zero)	Digestion tubes / 50 Powder Pack / 50 Powder Pack / 50 Powder Pack / 50 Reaction tubes / 50 Bottle, 100 ml Set (Tube test)	53 55 50
16 mm ø	N	VARIO TN HYDROX. HR Tubes VARIO PERSULFATE Reagent VARIO TN Reagent A VARIO TN Reagent B VARIO TN ACID LR/HR Tubes VARIO Deionised Water (for Zero)	Digestion tubes / 50 Powder Pack / 50 Powder Pack / 50 Powder Pack / 50 Reaction tubes / 50 Bottle, 100 ml Set (Tube test)	53 55 60
	O ₂	DPD No. 4 	Tablet / 100	51 12 20 BT
13 mm ø	O ₂	Vacu-vial® ^{j)}	Liquid reagent / 30 Adapter for Vacu-vials® ^{j)}	38 04 50 19 20 75

^{a)} determination of free, combined and total

^{b)} Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)

^{c)} MultiDirect: Adapter is necessary for Vacu-vials® (Order code 19 20 75)

^{d)} Spectroquant® is a Merck KGaA Trademark

^{e)} alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity

^{f)} additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine

^{g)} Reagent recovers most insoluble iron oxides without digestion

^{h)} additionally required for samples with hardness values above 300 mg/l CaCO₃

ⁱ⁾ high range by dilution

^{j)} Vacu-vials® is a Chemetrics Trademark

including stirring rod



Reagents

Reagents

Test	No. Methods	Range		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
				Wave lengths λ / nm									
Ozone	M300	0,02 - 1 mg/l	-	-	-	-	-	-	-	510	-	-	DPD/Glycine ⁵
		0,02 - 2 mg/l	530	530	530	530	530	530	-	510	510	510	
	M299	0,02 - 0,5 mg/l	-	-	-	-	-	-	-	510	510	510	
Ozone Powder	M301	0,015 - 2 mg/l	-	-	530	530	-	-	510	510	510	510	DPD/Glycine ⁵
Phenoles	M315	0,1 - 5 mg/l	-	-	-	-	-	-	507	507	507	507	4-Aminoantipyrine ¹
PHMB (Biguanides)	M70	2 - 60 mg/l	-	-	560	560	560	-	-	560	560	560	Buffer/Indicator
Phosphate-total LR ^{b)}	M317	0,07 - 3 mg/l	-	-	-	-	-	-	690	690	690	690	Phosphomolybdenum blue / Ascorbic acid ²
		0,2 - 10 mg/l	-	-	-	-	-	-	690	690	690	690	
Phosphate-total HR ^{b)}	M318	1,5 - 20 mg/l	-	-	-	-	-	-	690	690	690	690	Phosphomolybdenum blue / Ascorbic acid ²
		5 - 60 mg/l	-	-	-	-	-	-	690	690	690	690	
Phosphate LR, ortho	M320	0,016 - 1,3 mg/l	660	-	660	660	610	610	710	710	710	710	Phosphomolybdenum blue / Ascorbic acid ²
		0,05 - 4 mg/l	660	-	660	660	610	610	710	710	710	710	
Phosphate HR, ortho	M321	0,33 - 26 mg/l	-	-	430	430	-	-	470	470	470	470	Vanadomolybdate ²
		1 - 80 mg/l	-	-	430	430	-	-	470	470	470	470	
Phosphate VARIO ortho	M323	0,02 - 0,82 mg/l	660	-	660	660	-	-	890	890	890	890	Phosphomolybdenum blue / Ascorbic acid ²
		0,06 - 2,5 mg/l	660	-	660	660	-	-	890	890	890	890	
Phosphate VARIO ortho	M324	0,02 - 1,6 mg/l	-	-	660	660	-	-	890	890	890	890	Phosphomolybdenum blue / Ascorbic acid ²
		0,06 - 5 mg/l	-	-	660	660	-	-	890	890	890	890	
Phosphate-ortho	M322	1 - 20 mg/l	-	-	-	-	-	-	438	438	438	438	Vanadomolybdate ²
		3 - 60 mg/l	-	-	-	-	-	-	438	438	438	438	
Phosphate VARIO ^{b)} acid hydrolyzable and total	M325	acid hydrolyzable:											Acid digestion Phosphomolybdenum blue/ Ascorbic acid ² Acid-/ Persulphate digestion Phosphomolybdenum blue/ Ascorbic acid ²
		0,02 - 1,6 mg/l	-	-	660	660	-	-	890	890	890	890	
	0,06 - 5 mg/l	-	-	660	660	-	-	890	890	890	890		
	M326	total:											
0,02 - 1,1 mg/l													
		0,06 - 3,5 mg/l											

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⁵ Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®



Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Order code
24 mm ø 24 mm ø 50 mm □	O ₃	O ₃ in absence of Cl ₂ : DPD No. 1  DPD No. 3  O ₃ beside Cl ₂ : Combi pack# DPD No.1 / No.3  Combi pack# DPD No.1 / No.3  GLYCINE ^{f)}	Tablet / 100 Tablet / 100 each 100 each 250 Tablet / 100	51 10 50 BT 51 10 80 BT 51 77 11 BT 51 77 12 BT 51 21 70 BT
24 mm ø	O ₃	Chlorine total - DPD /F10 GLYCINE	Powder Pack / 100 Tablet / 100	53 01 20 51 21 70 BT
24 mm ø	C ₆ H ₅ O _H	PHENOLE No. 1 PHENOLE No. 2	Tablet / 100 Tablet / 100	51 59 50 BT 51 59 60 BT
24 mm ø	PHMB	PHMB PHOTOMETER	Tablet / 100	51 61 00 BT
16 mm ø	PO ₄ - P PO ₄	Reaction tube, Phosphate-101, Phosphate- 102, Phosphate-103	Tube test / 24 Tube test / 24	2 41 90 19 with Barcode
16 mm ø	PO ₄ - P PO ₄	Reaction tube, Phosphate-101, Phosphate-102, Phosphate-103	Tube test / 24	2 42 07 00 with Barcode
24 mm ø	PO ₄ - P PO ₄	PHOSPHATE No. 1 LR PHOSPHATE No. 2 LR Combi pack# PHOSPHATE No.1 LR / No.2 LR	Tablet / 100 Tablet / 100 each 100	51 30 40 BT 51 30 50 BT 51 76 51 BT
24 mm ø	PO ₄ - P PO ₄	PHOSPHATE No. 1 HR PHOSPHATE No. 2 HR Combi pack# PHOSPHATE No.1 HR / No.2 HR	Tablet / 100 Tablet / 100 each 100	51 58 10 BT 51 58 20 BT 51 76 61 BT
24 mm ø	PO ₄ - P PO ₄	VARIO Phosphate Rgt., F10	Powder Pack / 100	53 15 50
16 mm ø	PO ₄ - P PO ₄	VARIO Dilution Vial VARIO PHOSPHATE RGT, F10 VARIO Deionised Water (for Zero)	50 Tubes Powder Pack / 50 Bottle, 100 ml Set (Tube test)	53 52 00 with Barcode
16 mm ø	PO ₄ - P PO ₄	Reaction tube	Tube test / 24	2 42 07 01 with Barcode
16 mm ø 16 mm ø	PO ₄ - P PO ₄ PO ₄ - P PO ₄	VARIO Acid Reagent Vial VARIO PHOSPHATE RGT, F10 VARIO Deionised Water (for Zero) 1N NaOH 1,54 N NaOH VARIO Potassium Persulfate F10	50 Tubes Powder Pack / 50 Bottle, 100 ml Bottle / 100 ml Bottle / 100 ml Powder Pack / 50 Set (Tube test)	53 52 50 with Barcode

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^{c)} MultiDirect: Adapter is necessary for Vacu-vials® (Order code 19 20 75)

^{d)} Spectroquant® is a Merck KGaA Trademark

^{e)} alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity

^{f)} additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine

^{g)} Reagent recovers most insoluble iron oxides without digestion

^{h)} additionally required for samples with hardness values above 300 mg/l CaCO₃

ⁱ⁾ high range by dilution

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including stirring rod



Reagents

Reagents

Test	No. Methods	Range			MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
Phosphate VARIO ^{b)} total	M326	0,02 - 1,1 mg/l	-	-	660	660	-	-	890	890	890	890	890	Acid-/Persulphate digestion Phosphomolybdenum blue Ascorbic acid ²
		0,06 - 3,5 mg/l	-	-	660	660	-	-	890	890	890	890	890	
Phosphate, ortho ^{d)}	M328	0,016 - 1,6 mg/l	-	-	660	660	-	-	-	660	660	660	660	Stannous chloride ²
		0,05 - 5 mg/l	-	-	660	660	-	-	-	660	660	660	660	
Phosphate, ortho ^{d)}	M327	1,6 - 13 mg/l	-	-	430	430	-	-	-	430	430	430	430	Vanadomolybdate ²
		5 - 40 mg/l	-	-	430	430	-	-	-	430	430	430	430	
Phosphate LR	M334	0,033 - 3,3 mg/l	-	-	660	-	-	-	-	660	660	660	660	Phosphomolybdic acid// Ascorbic acid ²
		0,1 - 10 mg/l	-	-	660	-	-	-	-	660	660	660	660	
Phosphate HR, ortho	M335	1,63 - 26 mg/l	430	-	430	-	-	-	-	430	430	430	430	Vanadomolybdate ²
		5 - 80 mg/l	430	-	430	-	-	-	-	430	430	430	430	
Phosphonate VARIO	M316	0,02 - 125 mg/l	-	-	660	660	-	-	890	890	890	890	890	Persulfate UV-Oxidation
pH value	M329	5,2 - 6,8	-	-	560	560	560	-	-	560	560	560	560	Bromcresol purple ⁵
pH value	M330	6,5 - 8,4	560	560	560	560	560	560	558	558	558	558	558	Phenol red ⁵
pH value	M331	6,5 - 8,4	560	560	560	560	560	-	558	558	558	558	558	Phenol red ⁵
pH value	M332	8,0 - 9,6	-	-	560	560	560	-	-	560	560	560	560	Thymol blue ⁵
Polyacrylates	M338	1 - 30 mg/l	530	-	660	-	-	-	-	660	660	660	660	Turbidity

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Tube	Display	Reagent	Form of reagent/Quantity	Order code
16 mm ø 16 mm ø	PO ₄ - P PO ₄	VARIO Acid Reagent Vial VARIO PHOSPHATE RGT, F10 VARIO Deionised Water (for Zero) 1,54 N NaOH VARIO Potassium Persulfate F10	50 Tubes Powder Pack / 50 Bottle, 100 ml Bottle / 100 ml Powder Pack / 50 Set (Tube test)	53 52 10 with Barcode
	PO ₄ - P PO ₄	Vacu-vial® ^{j)}	Test Kit / 30 Adapter for Vacu-vials® ^{j)}	38 04 80 19 20 75
	PO ₄ - P PO ₄	Vacu-vial® ^{j)}	Test Kit / 30 Adapter for Vacu-vials® ^{j)}	38 04 60 19 20 75
24 mm ø	PO ₄ - P PO ₄	KS80 (CRP Reagent) KP119 (Ascorbic acid) Digestion reagents: KS278 (50 % Sulfuric Acid) KS135 (Phenolphthalein Indicator) KS144 (Calcium Hardness Buffer) KP962 (Ammonium Persulfate Powder)	Liquid reagent / 2 x 65 ml Powder / 20 g Set Liquid reagent / 65 ml Liquid reagent / 65 ml Liquid reagent / 65 ml Powder / 40 g	56L008065 56P011920 56R023765 56L027865 56L013565 56L014465 56P096240
24 mm ø	PO ₄ - P PO ₄	KS228 (Ammonium Molybdate) KS229 (Ammonium Metavanadate) Option Polyphosphate KS278 (50 % Sulfuric Acid) KS135 (Phenolphthalein Indicator) KS144 (Calcium Hardness Buffer) KP962 (Ammonium Persulfate Powder)	Liquid reagent / 65 ml Liquid reagent / 65 ml Set Liquid reagent / 65 ml Liquid reagent / 65 ml Liquid reagent / 65 ml Powder / 40 g	56L022865 56L022965 56R019090 56L027865 56L013565 56L014465 56P096240
24 mm ø	PO ₄	VARIO Potassium Persulfate F10 VARIO PHOSPHATE RGT, F10	Powder Pack / 100 Powder Pack / 200 Set	53 52 20
24 mm ø	pH	BROMOCRESOLPURPLE/PHOTOMETER	Tablet / 100	51 57 00 BT
24 mm ø	pH	PHENOLRED / PHOTOMETER	Tablet / 100	51 17 70 BT
24 mm ø	pH	PHENOLRED Solution	Liquid reagent / 15 ml	47 10 40
24 mm ø	pH	THYMOLBLUE / PHOTOMETER	Tablet / 100	51 57 10 BT
24 mm ø	Polyacryl	KS255 (Polyacrylate Reagent 1) KS256 (Polyacrylate Reagent 2) KS336 (Propan-2-ol) C18 (Cartouche) KS173 (2,4 Dinitrophenol) KT183 (Nitric Acid)	Liquid reagent / 65 ml Liquid reagent / 65 ml Set Liquid reagent / 65 ml Liquid reagent / 65 ml Liquid reagent / 65 ml	56L025565 56L025665 56R019165 56L033665 56A020101 56L017365 56L018365



^{a)} determination of free, combined and total

^{b)} Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)

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^{e)} alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity

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ⁱ⁾ high range by dilution

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Reagents

Reagents

Test	No. Methods	Range	Wave lengths λ / nm									Method
Potassium	M340	0,7 - 16 mg/l	-	-	660	430	-	-	730	730	730	Tetraphenylborate-Turbidity ⁴
PTSA (only MD 640)	M500	10 - 1000 ppb	-	-	> 395	-	-	-	-	-	-	Fluorescence
Silica VLR new!	M349	5 - 500 µg/l	-	-	-	-	-	-	820	820	820	Heteropolyblue ²
Silica	M350	0,05 - 4 mg/l	660	-	660	660	-	-	-	820	820	Silicomolybdate ^{2,3}
		0,05 - 3 mg/l	-	-	-	-	-	-	820	-	-	
		0,05 - 4 mg/l	-	-	-	-	-	-	-	820	820	
Silica VARIO LR	M351	0,1 - 1,6 mg/l	660	-	660	660	-	-	815	-	-	Heteropolyblue ²
		0,05 - 1,6 mg/l	-	-	-	-	-	-	-	815	815	
Silica VARIO HR	M352	1 - 90 mg/l 1 - 100 mg/l	430 -	- -	430 -	430 -	- -	- -	- 452	- 452	- 452	Silicomolybdate ^{2,3}
Silica	M353	0,1 - 8 mg/l	-	-	430	-	-	-	-	660	660	Heteropolyblue ²
Sodiumhypochlorite	M212	0,2 - 16 % 0,2 - 17 %	- -	- -	530 -	530 -	530 -	530 -	- -	- 470	- 470	Potassium iodide ⁵
Spectral Absorption-coefficient (S.A.K.)	M344	0,5 - 50 m ⁻¹	-	-	-	-	-	-	-	-	254	Direct reading ¹ ISO 7887:1994
	M345		-	-	-	-	-	-	436	436	436	
	M346		-	-	-	-	-	-	525	436	436	
	M347		-	-	-	-	-	-	620	620	620	
Spectral Absorption-coefficient (S.A.K.)	M344	3 - 250 m ⁻¹	-	-	-	-	-	-	-	-	254	Direct reading ¹ ISO 7887:1994
	M345		-	-	-	-	-	-	436	436	436	
	M346		-	-	-	-	-	-	525	525	525	
	M347		-	-	-	-	-	-	620	620	620	
Sulphate VARIO	M360	5 - 100 mg/l	530	-	530	530	530	-	450	530	530	Bariumsulphate Turbidity ²
	M361	50 - 1000 mg/l	-	-	530	530	-	-	530	530	530	
Sulphate	M355	5 - 100 mg/l	-	-	610	610	610	-	-	610	610	Bariumsulphate Turbidity ²

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Tube	Display	Reagent	Form of reagent/Quantity	Order code
24 mm ø	K	POTASSIUM T	Tablet / 100	51 56 70BT
24 mm ø	PTSA	no reagents required		
50 mm □	SiO ₂	Heptamolybdate Reagent Tartaric Acid Reagent Silica Amino Acid F10	Liquid reagent / 20 ml Liquid reagent / 20 ml Powder Pack / 100 Set	47 10 70 47 10 80 53 16 00 54 43 002
24 mm ø 10 mm □ 10 mm □	SiO ₂	SILICA No. 1 SILICA No.2 Combi pack# SILICA No.1 / No.2 Combi pack# SILICA No.1 / No.2 SILICA PR	Tablet / 100 Tablet / 100 each 100 each 250 Tablet / 100	51 31 30 BT 51 31 40 BT 51 76 71 BT 51 76 72 BT 51 31 50 BT
24 mm ø 24 mm ø	SiO ₂	VARIO Amino Acid F10 VARIO Citric Acid F10 VARIO Molybdate 3 Reagent solution	Powder Pack / 100 Powder Pack / 200 Liquid reagent / 2 x 50 ml Set	53 56 90
24 mm ø 24 mm ø	SiO ₂	VARIO Silica HR Molybdate F10 VARIO Silica HR Acid Rgt F10 VARIO Silica HR Citric Acid F10	Powder Pack / 100 Powder Pack / 100 Powder Pack / 100 Set	53 57 00
24 mm ø	SiO ₂	KS104 (Silica Reagent 1) KS105 (Silica Reagent 2) KP106 (Silica Reagent 3)	Liquid reagent / 65 ml Liquid reagent / 65 ml Powder / 10 g Set	56L010465 56L010565 56P010610 56R023856
24 mm ø	NaOCl	ACIDIFYING GP CHLORINE HR (KI) Combi pack# CHLORINE HR (KI)/ACIDIFYING GP Combi pack# CHLORINE HR (KI)/ACIDIFYING GP Dilution set for sample preparation	Tablet / 100 Tablet / 100 each 100 each 250 1 Set	51 54 80 BT 51 30 00 BT 51 77 21 BT 51 77 22 BT 41 44 70
50 mm □	-	no reagents required	-	-
10 mm □	-	no reagents required		
24 mm ø	SO ₄	VARIO Sulpha 4 / F10	Powder Pack / 100	53 21 60
24 mm ø	SO ₄	SULPHATE T	Tablet / 100	51 54 50 BT

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b) Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)

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h) additionally required for samples with hardness values above 300 mg/l CaCO₃

i) high range by dilution

j) Vacu-vials® is a Chemetrics Trademark

including stirring rod



Reagents

Reagents

Test	No. Methods	Range			MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
					Wave lengths λ / nm									
Sulphide	M365	0,04 - 0,5 mg/l	-	-	-	660	660	-	-	668	668	668	DPD/Catalysator ^{3, 4}	
Sulphite	M370	0,1 - 5 mg/l	-	-	430	430	-	-	-	405	405	405	DTNB	
		0,05 - 4 mg/l	-	-	-	-	-	-	-	405	-	-		
	M368	0,1 - 10 mg/l	-	-	-	-	-	-	-	405	405	405		
Surfactants (anionic)	M376	0,05 - 2 mg/l	-	-	660	660	-	-	660	660	660	Methylene blue ¹		
Surfactants (cationic)	M378	0,05 - 1,5 mg/l	-	-	610	610	-	-	610	610	610	Disulphine blue		
Surfactants (non ionic)	M377	0,1 - 7,5 mg/l	-	-	610	610	-	-	610	610	610	TBPE		
Suspended solids	M384	10 - 750 mg/l	660	-	660	660	-	-	660 660	810 810	810 810	Turbidity/Attenuated Radiation		
TOC ^{b)}	M380	5 - 80 mg/l	-	-	610	610	-	-	596	610	610	H ₂ SO ₄ / Indicator		
TOC ^{b)}	M381	50 - 800 mg/l	-	-	610	610	-	-	596	610	610	H ₂ SO ₄ / Indicator		
Triazoles (UV-lamp required)	M388	1 - 16 mg/l	430	-	430	-	-	-	-	430	430	Catalyzed UV Digestion		
Turbidity	M385	5 - 500	-	-	-	-	-	-	860	860	860	Attenuated Radiation Meth.		
	M386	10 - 1000	-	-	530	530	-	-	-	860	860	Attenuated Radiation Meth.		
Urea	M390	0,1 - 2,5 mg/l	610	610	610	610	610	-	-	676	676	Urease / Indophenol		
		0,1 - 2 mg/l	-	-	-	-	-	-	676	-	-			
	M391	0,2 - 5 mg/l ¹⁾	610	610	-	-	-	-	-	-	-			
Zinc	M400	0,02 - 1 mg/l	-	-	610	610	-	-	-	616	616	Zincon ³ /EDTA		
		0,02 - 0,5 mg/l	-	-	-	-	-	-	616	-	-			
Zinc	M405	0,1 - 2,5 mg/l	610	-	610	-	-	-	-	610	610	Zincon ³ /EDTA		

MSDS (Material Safety Data Sheets): www.lovibond.com

For other reagent quantities please see our current price list.

¹ Deutsche Einheitsverfahren zur Wasser-, Abwasser- und Schlamm- Untersuchung

² Standard Methods for the Examination of Water and Wastewater, 18th Edition; 1992

³ Photometrische Analysenverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart; 1989

⁴ Photometrische Analyse, Lange/Vejdelek, Verlag Chemie; 1980

⁵ Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®

Tube	Display	Reagent	Form of reagent/Quantity	Order code
24 mm ø	S	Sulphide No. 1 Sulphide No. 2	Tablet / 100 Tablet / 100	50 29 30 50 29 40
24 mm ø 24 mm ø 10 mm □	SO ₃	SULPHITE LR	Tablet / 100	51 80 20 BT
16 mm ø	MBAS	Spectroquant® 1.02552.0001	Tube test / 25	42 07 63
16 mm ø	CTAB	Spectroquant® 1.01764.0001	Tube test / 25	42 07 65
16 mm ø	Triton® X-100	Spectroquant® 1.01787.0001	Tube test / 25	42 07 64
24 mm ø 50 mm □	TSS	no reagents required	-	-
16 mm ø	TOC	Spectroquant® 1.14878.0001 ^{d)}	Tube test / 25 Aluminium screwcaps / 6 pc.	42 07 61 42 07 57
16 mm ø	TOC	Spectroquant® 1.14879.0001 ^{d)}	Tube test / 25 Aluminium screwcaps / 6 pc.	42 07 56 42 07 57
24 mm ø	Benzo- triazole	VARIO Triazole Rgt F25	Powder Pack / 100	53 22 00
50 mm □ 24 mm ø	FAU FAU	no reagents required	-	-
24 mm ø	CH ₄ N ₂ O	UREA-Reagent 1 UREA-Reagent 2 AMMONIA No. 1 AMMONIA No. 2 Combi pack# AMMONIA No.1 / No.2 Combi pack# AMMONIA No.1 / No.2 (without Urea-Reagent 1 and 2, please order seperatly) UREA PRETREAT (compensates for the interference of free Chlorine up to 2 mg/l) UREA Reagent Set, contains: UREA-Reagent 1/2, AMMONIA No.1/2, UREA PRETREAT	Liquid reagent / 15 ml Liquid reagent / 10 ml Tablet / 100 Tablet / 100 each 100 each 250 Tablet / 100 Set	45 93 00 45 94 00 51 25 80 BT 51 25 90 BT 51 76 11 BT 51 76 12 BT 51 61 10 BT 51 78 00 BT
24 mm ø	Zn	COPPER/ZINC LR EDTA DECHLOR (in case of high levels of residual chlorine)	Tablet / 100 Tablet / 100 Tablet / 100	51 26 20 BT 51 23 90 BT 51 23 50 BT
24 mm ø	Zn	KS243 (Zinc Reagent 1) KP244 (Zinc Reagent 2)	Liquid reagent / 65 ml Powder / 20 g Set	56L024365 56L024420 56R023965

^{a)} determination of free, combined and total

^{b)} Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)

^{c)} MultiDirect: Adapter is necessary for Vacu-vials® (Order code 19 20 75)

^{d)} Spectroquant® is a Merck KGaA Trademark

^{e)} alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity

^{f)} additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine

^{g)} Reagent recovers most insoluble iron oxides without digestion

^{h)} additionally required for samples with hardness values above 300 mg/l CaCO₃

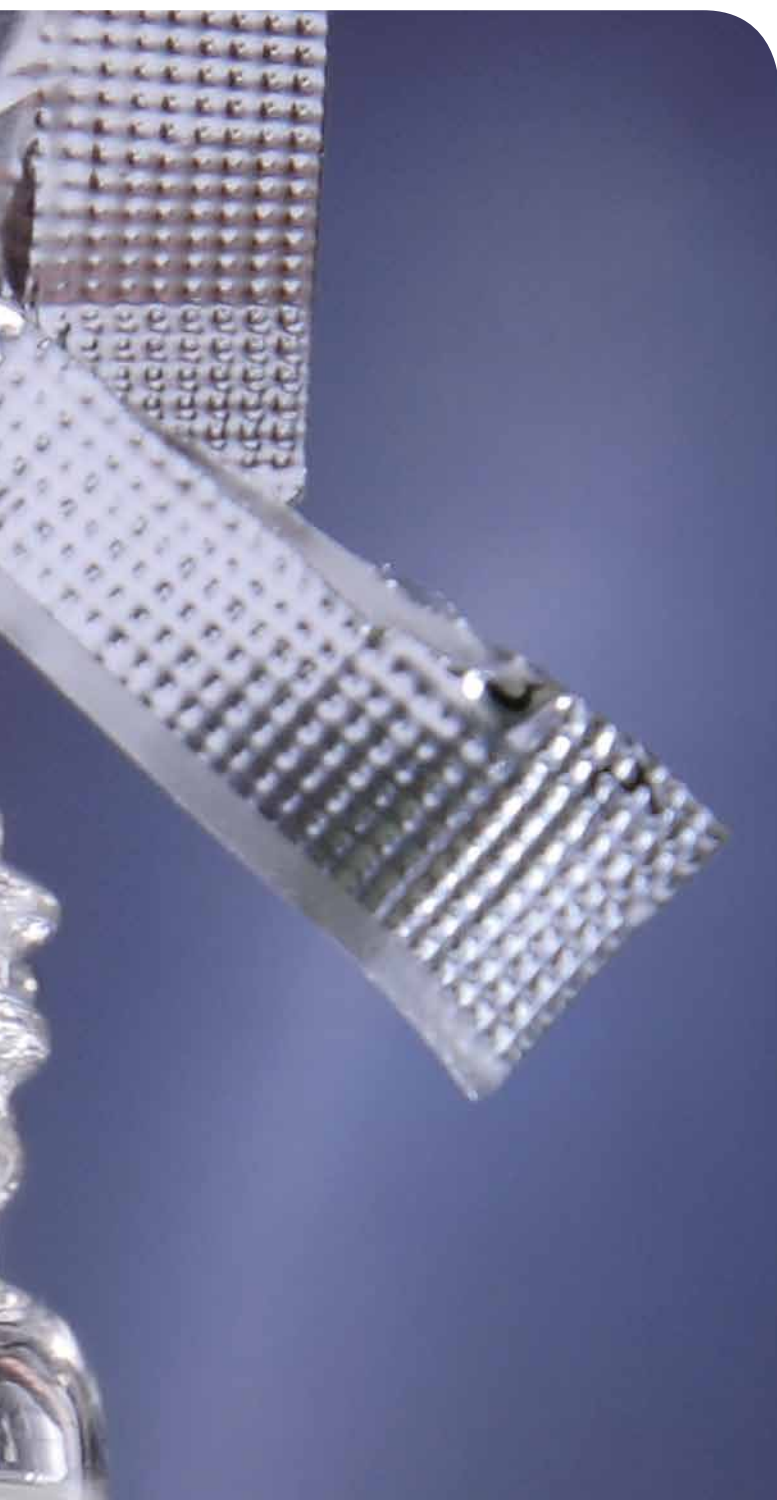
ⁱ⁾ high range by dilution

^{j)} Vacu-vials® is a Chemetrics Trademark

including stirring rod

Vario Reagents





Reagents
Page 112



Powder dispenser PD 250
Page 113



Process Chlorine Analyser Reagents

Suitable for Hach® CL17™ * Chlorine analysers

Significant cost savings

Replaces manufacturer reagents 1:1

Guaranteed Lovibond® quality

Reagent sets for 30 days continuous operation

Chlorine Analyser Reagents are available with the quality and longevity expected of the Lovibond® brand. That means **highest accuracy at low cost**.

These reagents can be used on the online system without additions or updates as they are supplied in compatible bottle size.

Delivery Content

Reagent set for process chlorine analyser in bag

Free Chlorine

- 1 bottle, 473 ml
DPD Indicator Solution "Free Chlorine"
- 1 bottle, 473 ml
DPD Buffer Solution "Free Chlorine"
- 1 bottle, 24 g DPD Indicator Powder
Order code: 53 02 10

Total Chlorine

- 1 bottle, 473 ml DPD Indicator Solution
"Total Chlorine"
- 1 bottle, 473 ml
DPD Buffer Solution "Total Chlorine"
- 1 bottle, 24 g DPD Indicator Powder
Order code: 54 02 10

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Determination of chlorine according to ISO 7393-2:2000 (free + total)

Chlorine DPD Powder Dispenser PD 250



250 Tests

Easy handling

5 years reagent shelf life (before opening)

Precise dosage

Vario Reagents

Delivery Content

PD 250 in carton including 1 reagent vial and instruction manual

PD 250 Set 1 - Free Chlorine

- 1 powder dispenser "Free Chlorine"
- 1 reagent vial "Free Chlorine"
- 1 instruction manual
- 1 protective sleeve (rubber)

Order code: 19 49 00

PD 250 Set 2 - Total Chlorine

- 1 powder dispenser "Total Chlorine"
- 1 reagent vial "Total Chlorine"
- 1 instruction manual
- 1 protective sleeve (rubber)

Order code: 19 49 10

Refill Packs

Article

Chlorine **Free** 10 ml
2 reagent vials

Chlorine **Total** 10 ml
2 reagent vials

Chlorine
Free + Total 10 ml
one reagent vial each

VARIO Chlorine **Free** 10 ml
2 reagent vials

VARIO Chlorine **Total** 10 ml
2 reagent vials

VARIO Chlorine
Free + Total 10 ml
one reagent vial each

Order code

53 01 40

53 01 50

53 01 60

53 01 45

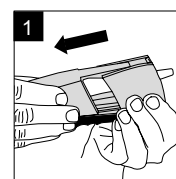
53 01 55

53 01 65

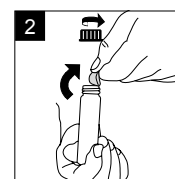
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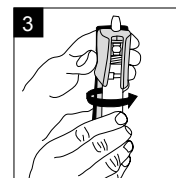
Easy Handling



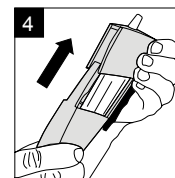
Remove the dispenser cover.



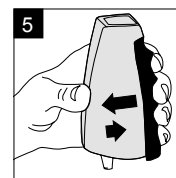
Uncap the reagent vial and remove the seal. Use material within 6 months of removing the seal.



Hold the dispenser with the tip upright and screw the vial on to the dispenser.



Slide the cover into the grooves until the lower end snaps into place.



To use:
Hold with the tip down and press the blue handle towards the dispenser body.



Reagents VARIO Powder Packs (PP) and Reagents

(also compatible in Hach® instruments*)

Test	Range	Reagent	Liquid Reagent	Tube Tests	Powder Pack
Aluminium	0 – 0,22 mg/l Al	VARIO Aluminium Reagent, Set F20 consists of: VARIO Aluminium ECR VARIO Aluminium Hexamine VARIO Aluminium Masking Rgt	■	■ ■	
Ammonia	0 – 0,5 mg/l N	VARIO Ammonia Nitrogen, Set F10 consists of: VARIO Ammonia Salicylate, F10 VARIO Ammonia Cyanurate, F10		■ ■	
Ammonia LR	0 - 2,5 mg/l N	VARIO Am tube test Reagent, Set LR, F5 consists of: VARIO Ammonia Salicylate, F5 VARIO Ammonia Cyanurate, F5 VARIO Am Diluent Reagent Low Range	■	■ ■	
Ammonia HR	0 - 50 mg/l N	VARIO Am tube test Reagent, Set HR, F5 consists of: VARIO Ammonia Salicylate, F5 VARIO Ammonia Cyanurate, F5 VARIO Am Diluent Reagent High Range	■	■ ■	
Bromine	0,05 - 4,5 mg/l Br	VARIO Chlorine TOTAL-DPD, F10 VARIO Chlorine TOTAL-DPD, F10		■ ■	
Chlorine free, combined and total Chlorine dioxide	Visual Test Kit up to 3,5mg/l Cl ₂ 0,01 - 2 mg/l Cl ₂ 0 - 5 mg/l Cl ₂	VARIO Chlorine FREE-DPD, F5 VARIO Chlorine FREE-DPD, F5 VARIO Chlorine TOTAL-DPD, F5 VARIO Chlorine TOTAL-DPD, F5 VARIO Chlorine FREE-DPD, F10 VARIO Chlorine FREE-DPD, F10 VARIO Chlorine TOTAL-DPD, F10 VARIO Chlorine TOTAL-DPD, F10 VARIO Chlorine FREE-DPD, F25 VARIO Chlorine FREE-DPD, F25 VARIO Chlorine TOTAL-DPD, F25 VARIO Chlorine TOTAL-DPD, F25		■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■	
Chlorine, online free and total	0,035 - 5 mg/l Cl ₂	Chlorine FREE Set consists of: Chlorine, DPD Compound (free & total) Chlorine FREE, Indicator Solution Chlorine FREE, Buffer Solution Chlorine TOTAL Set consists of: Chlorine, DPD Compound (free & total) Chlorine TOTAL, Indicator Solution Chlorine TOTAL, Buffer Solution	■ ■ ■	■	
COD LR	0 - 150 mg/l O ₂	COD VARIO 0 - 150 mg/l		■ ■ ■	
COD MR	0 - 1500 mg/l O ₂	COD VARIO 0 - 1500 mg/l		■ ■ ■ ■	
COD HR	0 - 15000 mg/l O ₂	COD VARIO 0 - 15000 mg/l		■ ■ ■	
Copper	0 - 5 mg/l Cu	VARIO CU1, F10 VARIO CU1, F10		■ ■	

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Pouches

Our Powder Packs have the right kink:
The powder reagent can be used easily with
two fingers in one grip and the right trick

The packaging automatically forms itself into
a funnel so nothing is lost.



Method	Applications	Quantity	Code
Eriochrome cyanine R	Water	1 Set 100 100 25 ml	53 50 00
Salicylate	Water, waste water, seawater	1 Set 2 x 100 2 x 100	53 55 00
Salicylate	Water, waste water, seawater	1 Set 50 50 50 tubes	53 56 00
Salicylate	Water, waste water, seawater	1 Set 50 50 50 tubes	53 56 50
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	100 1000	53 01 90 53 01 93
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	100	53 00 90
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	1000	53 00 93
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	100	53 00 80
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	1000	53 00 83
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	100	53 01 80
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	1000	53 01 83
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	100	53 01 90
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	1000	53 01 93
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	100	53 01 10
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	1000	53 01 13
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	100	53 01 30
DPD method: USEPA accepted for drinking water analysis	Water, waste water, seawater	1000	53 01 33
DPD method: USEPA accepted for drinking water analysis	for use in Hach® CL17 Process Analysers	1 Set 24 g	53 02 10 53 02 00
DPD method: USEPA accepted for drinking water analysis	for use in Hach® CL17 Process Analysers	473 ml	53 02 22
DPD method: USEPA accepted for drinking water analysis	for use in Hach® CL17 Process Analysers	473 ml	53 02 23
DPD method: USEPA accepted for drinking water analysis	for use in Hach® CL17 Process Analysers	1 Set 24 g	54 02 10 53 02 00
DPD method: USEPA accepted for drinking water analysis	for use in Hach® CL17 Process Analysers	473 ml	54 02 22
DPD method: USEPA accepted for drinking water analysis	for use in Hach® CL17 Process Analysers	473 ml	54 02 23
Dichromate Reactor, Digestion	Water, waste water, seawater	25 tubes 150 tubes 25 tubes, mercury free	2 42 07 20 2 42 07 25 2 42 07 10
Dichromate Reactor, Digestion	Water, waste water, seawater	25 tubes 150 tubes 25 tubes, mercury free 150 tubes, mercury free	2 42 07 21 2 42 07 26 2 42 07 11 2 42 07 16
Dichromate Reactor, Digestion	Water, waste water, seawater	25 tubes 150 tubes 25 tubes, mercury free	2 42 07 22 2 42 07 27 2 42 07 12
Biquinolin	Water, waste water, seawater	100 1000	53 03 00 53 03 03





Reagents VARIO Powder Packs (PP) and Reagents

(also compatible in Hach® instruments*)

Test	Range	Reagent	Liquid Reagent	Tube Tests	Powder Pack
DEHA	20 - 500 µg/l DEHA	VARIO DEHA REAGENT SET consists of: VARIO OXYSCAV 1 RGT VARIO DEHA 2 RGT	■	■	
Hydrazine	0,005 - 0,6 mg/l N ₂ H ₄	VARIO Hydra2 Reagent	■		
Iron (Fe²⁺, Fe³⁺), dissolved	0 - 3 mg/l Fe 0 - 1,8 mg/l Fe	VARIO Ferro, F10 VARIO IRON TPTZ		■ ■	
Iron, total, Fe in Mo	0,01 - 1,8 mg/l	VARIO (Fe in Mo) Reagent Set consists of: VARIO (Fe in Mo) Rgt 1 VARIO (Fe in Mo) Rgt 2		■ ■	
Manganese LR	0 - 0,7 mg/l Mn	VARIO Manganese Reagent, Set LR, F10 consists of: VARIO Alkaline-Cyanide Reagent Solution VARIO Ascorbic Acid VARIO PAN Indicator Solution	■ ■	■	
Manganese HR	0 - 20 mg/l Mn	VARIO Manganese Reagent, Set HR, F10 consists of: VARIO MANGANESE CITRATE BUFFER, F10 VARIO SODIUMPERIODATE, F10		■ ■	
Molybdate LR	0,5 - 5 mg/l MoO ₄	VARIO MOLYBDENUM LR, Set, F10 consists of: VARIO Molybdenum 1 LR, F20 VARIO Molybdenum 2 LR	■	■	
Molybdate HR	0 - 35 mg/l Mo	VARIO MOLYBDENUM HR, Set F10 consists of: VARIO MOLYBDENUM HR1, F10 VARIO MOLYBDENUM HR2, F10 VARIO MOLYBDENUM HR3, F10		■ ■ ■	
Molybdate HR	0 - 35 mg/l Mo	VARIO MOLYBDENUM HR, Set F25 consists of: VARIO MOLYBDENUM HR1, F25 VARIO MOLYBDENUM HR2, F25 VARIO MOLYBDENUM HR3, F25		■ ■ ■	
Nitrate	0 - 30 mg/l N	VARIO NITRA X Reagent, Set consists of: VARIO NITRA X Test vials VARIO NITRA NITROGEN NITRATE Reag. B Deionised water	■	■ ■	
Nitrite LR	0 - 0,3 mg/l N	VARIO NITRI3, F10 VARIO NITRI3, F25		■ ■	
Nitrogen, total LR	0 - 25 mg/l N	VARIO TOTAL NITROGEN LR, Set consists of: VARIO TOTAL NITROGEN HYDROX. LR, Set VARIO TOTAL NITROGEN HYDROX. LR, tubes VARIO TOTAL N PERSULFATE Reagent, VARIO TOTAL NITROGEN ACID LR, tubes VARIO TOTAL NITROGEN Reag. A VARIO TOTAL NITROGEN Reag. B VARIO TOTAL NITROGEN ACID LR/HR tubes Deionised water	■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■	

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Method	Applications	Quantity	Code
PPST		1 Set 100 100 ml	53 60 00
4-(Dimethylamino)-benzaldehyde	Water, waste water, seawater	100 ml	53 12 00
Iron, total: 1, 10-phenantroline	Water, waste water, seawater	100	53 05 60
Iron, total: TPTZ	Water, waste water, seawater	100	53 05 50
Fe in Mo	Water, waste water	1 Set 100 100	53 60 10 53 03 10 53 03 20
PAN	Water, waste water	1 Set 60 ml 100 60 ml	53 50 90
Periodate oxidation	Water, waste water	1 Set 100 100	53 51 00
Mercaptoacetic acid	Water, waste water	1 Set 100 100	53 54 50
Thioglycolic acid	Water, waste water	1 Set 100 100 100	53 53 00
Thioglycolic acid	Water, waste water	1 Set 100 100 100	53 54 00
Chromotropic acid	Water, waste water	1 Set 50 50 100 ml	53 55 80
Diazotiation	Water, waste water	100 100	53 09 80 53 09 70
Persulfate digestion	Water, waste water	1 Set 50 50 50 50 50 100 ml	53 55 50





Reagents VARIO Powder Packs (PP) and Reagents

(also compatible in Hach® instruments*)

Test	Range	Reagent	Liquid Reagent	Tube Tests	Powder Pack
Nitrogen, total HR	5 - 150 mg/l N	VARIO TOTAL NITROGEN HR, Set consists of: VARIO TOTAL NITROGEN HYDROX. HR, Set VARIO TOTAL NITROGEN HYDROX. HR, tubes VARIO TOTAL N PERSULFATE Reagent, VARIO TOTAL NITROGEN ACID LR, tubes VARIO TOTAL NITROGEN Reag. A VARIO TOTAL NITROGEN Reag. B VARIO TOTAL NITROGEN ACID LR/HR tubes Deionised water	■	■ ■ ■ ■	
Phosphate	0 - 2,5 mg/l PO ₄	VARIO PHOSPHATE RGT, F10		■	
Phosphate, ortho	0,06 - 5 mg/l PO ₄	VARIO REACTIVE PHOSPHATE REAGENT SET consists of: VARIO PHOSPHATE DILUTION TUBE TEST VARIO PHOSPHATE RGT, F10 Deionised water	■	■	■
Phosphate, Acid hydrolyzable and 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 TOTAL & ACID HYDROLYZABLE PHOSPHATE REAGENT SET consists of: VARIO PHOSPHATE ACID REAG. TUBE TEST Deionised water VARIO PHOSPHATE RGT, F10 VARIO SODIUM HYDROXID 1N VARIO SODIUM HYDROXID 1,54N VARIO POTASSIUM PERSULFATE	■ ■ ■	■ ■ ■	
Phosphate, total	0,02 - 1,1 mg/l P Δ 0,06 - 3,5 mg/l PO ₄	VARIO TOTAL PHOSPHATE REAGENT SET consists of: VARIO PHOSPHATE ACID REAG. TUBE TEST VARIO PHOSPHATE RGT, F10 Deionised water VARIO SODIUM HYDROXID 1,54N VARIO POTASSIUM PERSULFATE	■ ■	■ ■	■
Phosponate	0,02 - 125 mg/l PO ₄	VARIO PHOSPHONATE REAGENT SET consists of: VARIO Potassium Persulfate F10 VARIO PHOSPHATE RGT, F10		■ ■	
Silica, LR	0 - 1,6 mg/l SiO ₂	VARIO SILICA Reagent LR, Set F10 consists of: VARIO LR SILICA AMINO ACID F VARIO SILICA CITRIC ACID VARIO MOLYBDATE 3 Reagent solution	■	■ ■	
Silica, HR	0 - 100 mg/l SiO ₂	VARIO SILICA Reagent HR, Set F10 consists of: VARIO SILICA HR MOLYBDATE, F10 VARIO SILICA HR ACID RGT, F10 VARIO SILICA CITRIC ACID, F10		■ ■ ■	
Silica, UHR	0 - 200 mg/l SiO ₂	VARIO SILICA Reagent HR, Set F25 consists of: VARIO SILICA HR MOLYBDATE, F25 VARIO SILICA HR ACID RGT, F25 VARIO SILICA HR CITRIC ACID, F25		■ ■ ■	
Sulphate	0 - 70 mg/l SO ₄	VARIO Sulpha 4, F10 VARIO Sulpha 4, F25		■ ■	
Triazoles	1 - 16 mg/l	VARIO Triazole Rgt F25		■	

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Method	Applications	Quantity	Code
Persulfate digestion	Water, waste water	1 Set 50 50 50 50 50 100 ml	53 55 60
Phosphomolybdic acid/ Ascorbic acid	Water, waste water, seawater	100	53 15 50
Phosphomolybdic acid/ Ascorbic acid	Water, seawater	1 Set 50 50 100 ml	53 52 00
Phosphomolybdic acid/ Ascorbic acid	Water, seawater	1 Set 50 50 100 ml 100 ml 100 ml 50	53 52 50
Phosphomolybdic acid/ Ascorbic acid	Water, seawater	1 Set 50 50 100 ml 100 ml 50	53 52 10
Persulfate UV-Oxidation	Water	1 Set 100 200	53 52 20
Heteropoly blue	Water, seawater	1 Set 100 200 2 x 50 ml	53 56 90
Silicomolybdate	Water, seawater	1 Set 100 100 100	53 57 00
Silicomolybdate	Water, seawater	1 Set 100 100 100	53 59 00
USEPA accepted for drinking water analysis	Water, waste water, seawater	100 100	53 21 60 53 21 50
Catalyzed UV Digestion	Water	100	53 22 00



Turbidity





TB 300 IR
Page 122



TB 211 IR
Page 124



TB 250 WL
Page 125



Laboratory Turbidity Measurement TB 300 IR

with infrared light source



Turbidity is measured according to EN ISO 7027 by nephelometric means (90° scattered light). The infrared light-source permits measurement of coloured and colour-free samples.

The automatic measurement range detection facility (Autorange) enables direct turbidity measurement from 0.01 to 1100 NTU with an accuracy of $\pm 2\%$ up to 500 NTU and $\pm 5\%$ thereafter.

A large graphic display, a choice of several different languages and user-friendly operating instructions make the instrument extremely easy to use.

Software updates (for example: languages) can be downloaded free of charge.



Technical data

Principle	nephelometric (90° scattered light)
Light source	IR-LED (860 nm)
Keypad	acid and solvent resistant; membrane keypad
Auto – Off	automatic switch off
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), whichever is greater
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)
CE-Conformity	

Accessories

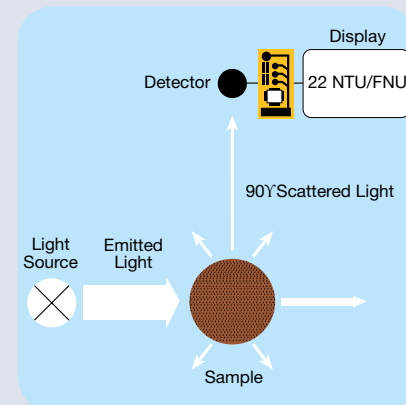
Set of 12 sample vials with black lid, height 55 mm, ø 24 mm	19 76 55
Cleaning cloth for vials	19 76 35
Rubber seal cap, black for interface and power plug-in	19 80 17 16
Sample chamber lid, black	19 80 11 19
Mains charger, 100-240 V, 50-60 Hz, with international adapters	19 30 10
Connection cable connection to PC, serial 9-pins	19 81 98
AA Battery Mignon, 1100 mAh (7 pc.)	19 50 02 0
Lithium battery	19 50 01 7
Formazin Stock Solution (4000 NTU), 125 ml	19 41 41
Formazin Stock Solution (4000 NTU), 250 ml	19 41 42
Set Turbidity Standards T-CAL (<0.1, 20, 200, 800 NTU)	19 41 50
Paper Printer (Adapter and RS 232-Cable included)	198077

Delivery Content

- Instrument in plastic case
 - 1 set of turbidity standards T-CAL
 - 7 rechargeable batteries (AA)
 - 1 lithium battery
 - Mains charger, 100-240 V
 - PC connection cable
 - 4 cells (ø 24 mm) with lids
 - Warranty information
 - Certificate of Compliance
 - Instruction Manual
- Order code: 19 40 00-B
Order code: 19 40 00
(without lithium battery)



i



Turbidity measurement

In pool water, turbidity is an indication for the effectiveness of the filter system and cleaning agents. In drinking water it indicates the possible bacterial growth. In sewage treatment plants the turbidity is an indicator of quality in the cleaning procedures. In industries, turbidity is a quality criterion for products.

The cause of turbidity is usually tiny small particles or droplets that do not dissolve in the surrounding liquids.

The light is distracted by these substances and is partly absorbed and scattered. This scattered light is measured for turbidity levels.

The measurement is made at a 90° angle with infrared or white light.

Formazine solutions are used for calibration.



T-Cal Formazine Primary Standards are stable for 12 months due to a special stabilisation and help to calibrate our turbidimeters easily and safely.



Mobile turbidity measurement

TB 211 IR with infrared light source (EN ISO 7027) & USB-Interface



Technical data

Measurement cycle	approx. 8 seconds
Display	backlit LCD (on keypad)
Optics	temperature-compensated LED ($\lambda = 860 \text{ nm}$) and photosensor amplifier in water proof sample chamber, infrared light
Keypad	polycarbonate membrane, splash proof
Power supply	9 V power pack battery
Auto - OFF	automatic switch-off
Interface	Micro-USB
Storage	internal ring memory for 125 data sets
Additional feature	real time clock and date
Range (Auto-range)	0,01 - 1100 NTU
Resolution	0.01 - 9.99 NTU = 0.01 NTU 10.0 - 99.9 NTU = 0.1 NTU 100 - 1100 NTU = 1 NTU
Accuracy	$\pm 2.5 \%$ of reading or $\pm 0.01 \text{ NTU}$ whichever is bigger 500 - 1100 NTU: $\pm 5 \%$ of reading
Housing	ABS
Dimensions (L x W x H)	190 x 110 x 55 mm
Weight	approx. 0.4 kg (basic unit)
Ambient conditions	Temperature: 5 – 40 °C rel. humidity: 30 – 90 %
CE-Conformity	

The compact Lovibond® infrared turbidity measuring instrument TB 211 IR for fast and accurate on-site analysis. It is measured as provided in EN ISO 7027, the scattered light at an angle of 90°.

The wide measuring range from 0.01 to 1100 TE / F = NTU = FNU with a detection limit of 0.01 NTU allows the use of the instrument in different areas, from drinking water to wastewater.

Since the measurements are made by means of infrared light, both coloured and colourless water samples can be measured. A direct transfer of the measurement results to a PC is easy to set up via the USB interface. The required USB cable is a standard part of the scope of the delivery.

Accessories

Article	Code
Turbidity standard set T-CAL (< 0.1, 20, 200, 800 NTU)	19 41 50
Set empty vials, 24 mm ø (12 pc.)	19 76 55
Cleaning cloth for vials	19 76 35
Sample chamber lid	19 80 11 00
Battery, 9 V	19 50 012
Formazin Stock Solution (4000 NTU), 125 ml	19 41 41
Formazin Stock Solution (4000 NTU), 250 ml	19 41 42
USB-Cable 1.5 m	19 80 25 09

Delivery Content

- Instrument in plastic case
- 4 turbidity standards (< 0.1, 20, 200 and 800 NTU)
- 9 V battery
- 2 cells (ø 24 mm) with lids
- USB cable 1.5 m
- Warranty information
- Certificate of Compliance
- Instruction Manual

Code: 26 60 30

Mobile turbidity measurement

TB 250 WL with white light source (EPA 180.1)



The TB 250 WL allows easy turbidity measurement either in the field or in the laboratory. Using a „white light“ source and 90° detection, the TB 250 WL meets the specifications for EPA turbidity measurement (EPA Standard 180.1). A power efficient micro-circuit design allows the instrument to yield 5000 tests on 4-AA alkaline batteries with an estimated 7-10 year bulb life. Integrated diagnostics confirm proper operation and accuracy. The instrument features an Auto-Ranging feature that automatically selects the correct turbidity range for your sample. Calibration is simple with the included calibration standards. The instrument comes with all the required items for testing including the TB 250 WL Turbidimeter, sample, cuvettes, batteries, calibration set, operators manual and carrying case.

Technical data

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 reading or ± 0.01 NTU whichever is greater 500 - 1100 NTU: ± 3 % of reading
Resolution	0.01 NTU to 99.99 NTU 0.1 NTU from 100.0 to 999.9 NTU 1.0 NTU from 1000 to 1100 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 %
CE-Conformity	

Accessories

Set of secondary standards
0.02, 10, 1000 NTU
Order code: 19 42 80

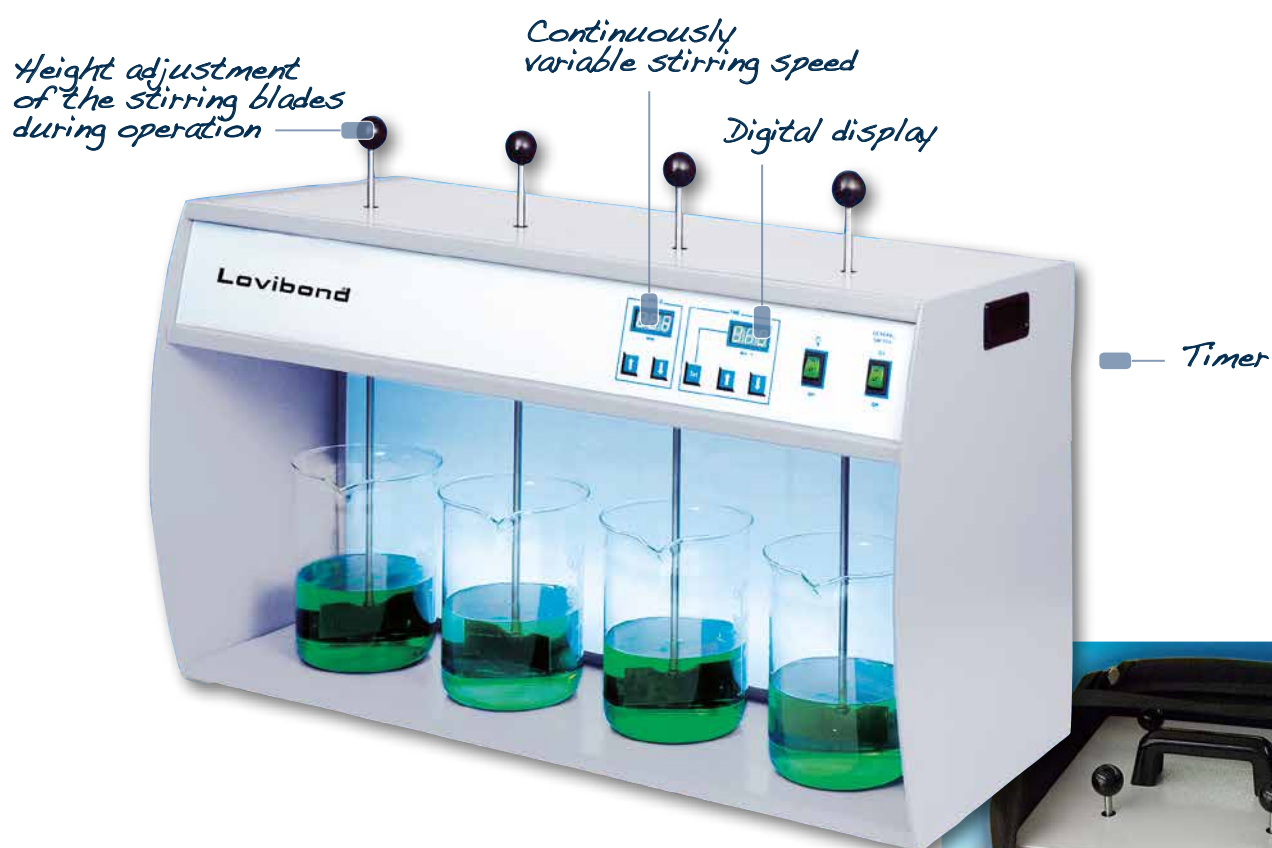
Set of 3 vials
with black lids
Order code: 19 42 90

Delivery content

- Instrument in a sturdy handy case
 - 2 sample cells
 - 3 turbidity standards
 - 4 batteries
 - Instruction manual
 - Warranty information
- Order code: 19 42 00



Floc-Tester



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

Applications

- Flocculant Manufacturer
- Research Centres
- Waste Water Treatment Plants
- Universities
- Laboratories



ET 740 (laboratory)

Stirring places	four
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. 13 kg
Dimensions (mm)	645 L x 347 W x 260 H
EC-conformity	CE
Order code	2 41 91 55

ET 750 (laboratory)

Stirring places	six
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. 17 kg
Dimensions (mm)	935 L x 347 W x 260 H
EC-conformity	CE
Order code	2 41 91 60

ET 730 (portable/field)

Stirring places	four
Stirring speed control	20 - 40 - 50 - 100 - 200 revolutions per minute
Timer	1 - 30 minutes (continuous)
Power supply	100 – 240 V, 50 - 60 Hz (including adapter for connection in the car)
Weight	approx. 4.8 kg
Dimensions (mm)	250 L x 320 W x 250 H
EC-conformity	CE
Order code	2 41 91 50

Measuring beaker, glass, low form, 1000 ml

41 91 65

Measuring beaker, PP, low form, 1000 ml

41 91 66

Bag for transport of ET 730

41 91 51

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, they have to be ordered separately.





BOD Measurement System

BD 600 & BD 600 GLP



Accurate, automatic and direct
control of your waste water samples

References

- APHA, AWWA, WEF
Standard Methods 5210 D,
OECD 301 F, 301 C, 302 C

Applications

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

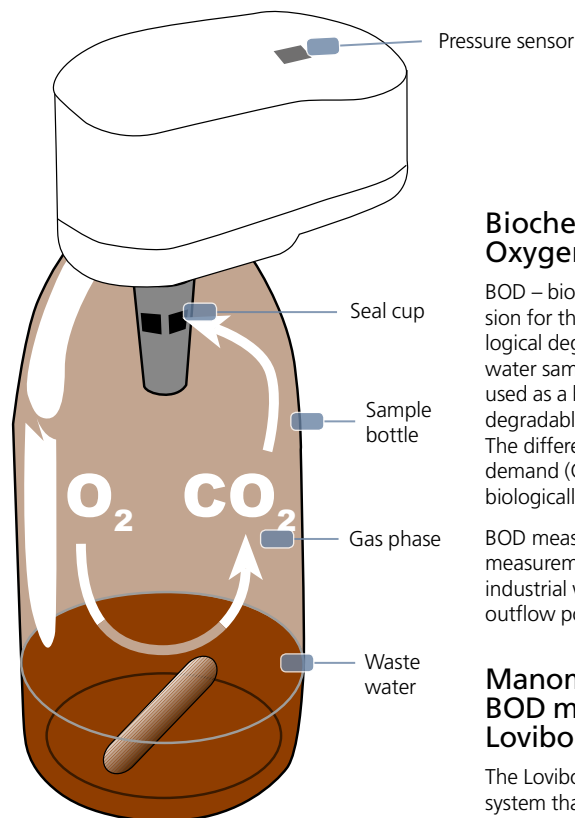
Respirometric principle

Respirometric methods provide direct measurements of the oxygen consumed by microorganisms from an air or the 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 sealed 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 automatically in the sensor memory in regular intervals 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. Measurement series can be stored on USB stick/SD card or transferred via the USB cable to evaluate the data on a computer.

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.



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

Manometric, respirometric BOD measurement using the Lovibond® BD 600

The Lovibond® sensor system BD 600 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 modern integral pressure sensors, it is no longer necessary to use mercury for pressure measurements.

Evaluation of measurements

The BD 600 measuring system records a measurement once every hour, independent of the length of the measuring period. This way the quality of the series of measurement can be evaluated at an early stage. Current values and stored values may be called up at any time. Stored values can be displayed numerically or graphically. The table/graph on the left illustrates an example of BOD₅ evaluation. The development of BOD over a period of five days is easily seen.

Automatic start function

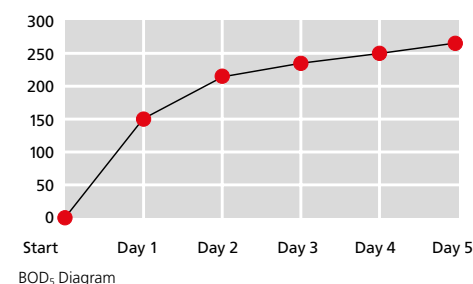
Variations in sample temperature prior to testing result in pressure variations within the measuring system during the temperature equalisation period in the thermostatically controlled cabinet (if BOD measurement is to take place at 20°C, for example). Such variations would normally cause errors during manometric measurement. In order to prevent such errors, the Lovibond® BD 600 BOD meter is equipped with an automatic start feature:

measurement does not commence 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.

Complete measuring system

In addition to the BOD unit for the measurement and storage of BOD levels, the Lovibond® BD 600 BOD measuring system includes the 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.

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





- Supports the requirements for GLP
- Suitable for BOD measurements and tests according to OECD 301F
- Protected, more permanent memory for all data over the lifetime of the instrument (1 GB)
- Long term tests of up to 90 days measurement duration possible
- Simplified data transfer to the PC via USB
- Graphical user interface

BD 600 GLP

(OECD 301 F, 301 C, 302 C)

Optimized for biodegradability tests under GLP requirements

The REACH provisions stipulate that every chemical with a production volume of more than one tonne / year must be registered and tested. These tests follow precise guidelines and procedures, which, among other things, examine the residence time of chemicals in the environment. Therefore, the demand for tests for the measurement of biodegradability according to OECD standard 301F is correspondingly high. While performing these tests laboratories need to comply with GLP (Good Laboratory Practice) standards.

With the BD 600 GLP, we have developed a new system that combines modern design and up-to-date data exchange via USB with GLP-compliant data management and a lifetime of the instrument's protected resident memory (1 GB). All settings and changes are registered and logged. Any manipulation is thus prevented, erasure of data is impossible. The sensor heads are validated and delivered with a test certificate.

Delivery Content

- **BD 600 (Order code: 2 44 44 60)** or **BD 600 GLP (Order code: 2 44 44 61)**, complete unit with 6 sensors and control unit with batteries (BD 600 GLP with certificate)
- Power supply unit incl. Y-cable for common power supply of BD 600 and stirring unit
- 1 x remote control (without batteries)
- Inductive stirring unit
- 6 sample bottles
- 6 rubber gaskets
- 6 magnetic stirring rods
- 1 overflow flask, 157 ml
- 1 overflow flask, 428 ml
- 1 bottle, 50 ml potassium hydroxide solution
- 1 bottle, 50 ml Nitrifikationshemmstoff
- 1 instruction manual
- 1 x USB cable (BD 600 only)
- Warranty

BD 606

Order code: 2 44 44 65

- 2 x BD 600 complete unit with 12 sensor heads and control units with batteries
- 2 x Power supply unit incl. Y-cable for common power supply of BD 606 and stirring unit
- 2 x USB cable
- 2 x Inductive stirring unit
- 12 sample bottles
- 12 rubber gaskets
- 12 magnetic stirring rods
- 1 overflow flask, 157 ml
- 1 overflow flask, 428 ml
- 1 bottle, 50 ml potassium hydroxide solution
- 1 bottle, 50 ml nitrification inhibitor solution
- 1 instruction manual
- 1 x remote control (without batteries)
- Warranty

Technical data	BD 600	BD 600 GLP
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	
Applications	BSB ₅ , BSB ₇	OECD 301 F, 301 C, 302 C
Display	128 x 240 Pixel, 45 x 84 mm backlit	Large graphic display
Measurement period	User-selectable, between 1 and 28 days	5, 28, 60 and 90 days
Auto result storage	Up to 744 results, depending on measurement period and amount of sample bottles	up to 50.000 measurements (1GB)
Storage interval	- hourly (1. day) - every 2 hours (2. day) - 1x daily (3.-28. day)	- every 2 hours (5 days) - every 12 hours (28 days) - every 24 hours (60 days) - every 24-48 hours (90 days)
Autostart function	equalisation of samples with a temperature of 15 to 21 °C, can be switched off	-
Power supply	3 alkaline-manganese batteries ("Baby" cells/size "C") or via power supply unit using y-cable with stirring unit	100 - 240 V / 50-60 Hz
Interface	USB-host port (USB-storage medium) USB-Instrument-Port (Computer) SD-card (for BD 600 GLP occupied)	
Clock	Real-time clock with date	
Dimensions (L x W x H)	375 x 181 x 230 mm including stirring unit	
Weight	ca. 4100 g, unit with bottles & batteries approx 5775 g, complete with stirring unit	
Approval	CE	

Accessories

Item	BD 600	BD 600 GLP	Order code
BSB-Sensor	•		2 44 44 70
Sensor BOD GLP validated with certificate		•	2444470-GLP
Sensor validation with certificate		•	999610-GLP
BOD sample bottle, Brown glass, 500 ml	•	•	41 86 44
BOD sample bottle, Brown glass, 500 ml, set of 6 bottles	•	•	41 86 45
Inductive stirring system for 6 samples, 100-240 V / 50-60 Hz, incl. power supply	•	•	2 44 44 56
Power supply unit for inductive stirring system, 100 - 240 V / 50 - 60 H	•	•	44 44 54
Magnetic stir bar	•	•	41 86 33
Magnetic stir bar, 100 pc.		•	41 86 33-100
Stir bar remover	•	•	41 86 38
Rubber gasket 4,5 cm	•		41 86 36
Rubber gasket GLP 6,5 cm	•	•	41 86 76
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 10 tablets	•	•	2 41 83 28
USB cable 3 m	•	•	2 44 44 82
Y cable	•	•	2 44 44 75
Remote control	•	•	2 44 44 81



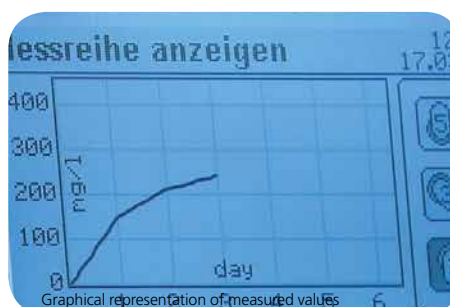
BOD Accessoires



BOD CM test tablets, order code: 2 41 83 28



Inductive stirring system



Test set for BD 600

We also supply a test set to check for the correct operation of the Lovibond® BD 600 BOD meter. The set contains 10 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.

Temperature equalisation during BOD measurement

Temperature equalisation 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.

For temperature equalisation, we recommend Lovibond® thermostatically controlled cabinets with a user-selectable temperature from 2°C to 40°C.



Remote control



environmentally
friendly coolant!

Thermostatically controlled incubators TC-Series

*Illuminated LED display of
preset and current temperatures*



*Temperature
control unit*

*Low power
consumption*

*Ideal for BOD
determination
at 20 °C*

The TC series of thermostatically controlled cabinets is used for continuous temperature control over a range of 2 °C to 40 °C. This makes them ideal for a wide range of different applications in industrial and research laboratories.

In particular they are ideal for the temperature-controlled storage of samples or BOD determination in effluent analysis work.

The temperature can be set in steps of 0.1 °C and an LED display shows both the set temperature and the current temperature in the cabinets. Instruments such as magnetic agitators, which require a power supply, can be connected to sockets incorporated in the interior of the cabinet. The integral temperature control unit meets the requirements of the EMC directive issued as IEC 61326: "Electrical instruments for measurement, monitoring and for use in laboratories".

Improved, robust, insulated housing and highly efficient components provide maximum energy efficiency.

There are 3 models available with standard doors from 135 to 445 litres net capacity, and 2 models with glass doors with 140 and 255 litres net capacity, the doors are lockable.

Space for BD 600-systems		
Model	6er-systems, standard ¹⁾	6er-systems, comfort ²⁾
TC 135 S / TC 140 G	3	2
TC 255 S / TC 256 G	7	3
TC 445 S	12	9

1) Change of bottles by removing racks.

2) Change of bottles without removing racks.



Temperature control unit

The temperature control unit fulfils the EMC requirements according to IEC 61326 : Electrical equipment for measurement, control and laboratory use.

Applications

- BOD Measurement
- Microbiological Research
- Food Industry
- Dairies
- Laboratories
- Research Centres
- Universities

Technical Data	Models with standard door			Models with glass door	
	TC 135 S	TC 255 S	TC 445 S	TC 14-0 G	TC 256 G
Cooling/Heating	Integrated powerful cooling and heating				
Coolant	R600a				
Design	Fully insulated cabinet with universal temperature control unit				
Display	Backlit LED display				
Operation	Splash-proofed keypad, 2 buttons with tactile feedback				
Fan	Axial, output 320 m³/h				
Control range	+ 2 °C to + 40 °C, steps of 0.1 °C				
Power supply	220 - 240 V / 50 Hz				
Sockets	CEE 7/5, type E with hinged lid, 230 V / 16 A 2p + E, IP 4				
Door	lockable, door hinges changeable			Insulating glass door in an ABS frame, ceiling lighting, separately switchable	
Temperature tolerance	± 1 °C, specified for a stirred 500 ml water sample. For BOD (T=20 °C ±0.5 °C)				
Lighting				LED light bar	fluorescent tube
Climate class	+ 10 °C to + 32 °C (SN)		+10 to +43 °C (SN-T)	+ 10 °C to + 32 °C (SN)	
Shelf	3 retractable grids + 4 sockets	4 retractable grids + 1 bottom grid + 7 sockets	4 retractable grids + 1 bottom grid + 9 sockets	3 retractable grids + 1 bottom grid + 4 sockets	4 retractable grids + 1 bottom grid + 7 sockets
Energieverbrauch	ca. 1.41 kWh / 24h*	ca. 1.33 kWh / 24h*	ca. 1.24 kWh / 24h*	ca. 1.61 kWh / 24h**	ca. 1.91 kWh / 24h**
Inside dimensions (ca.)	513 W x 441 D x 702 H mm	470 W x 440 D x 1452 H mm	600 W x 560 D x 1452 H mm	513 W x 441 D x 702 H mm	470 W x 440 D x 1452 H mm
Overall dimensions (ca.)	600 W x 600 D x 850 H mm with worktop 600 W x 600 D x 819 H mm without worktop built-under	600 W x 610 D x 1640 H mm	750 W x 730 D x 1640 H mm	600 W x 600 D x 850 H mm with worktop 600 W x 600 D x 819 H mm without worktop built-under	600 W x 610 D x 1640 H mm
Net capacity (ca.):	135 l	255 l	445 l	140 l	255 l
Weight	39.0 kg	45 kg	78,5 kg	48,0 kg	77,0 kg
Shelf loading capacity	45 kg		60 kg	45 kg	
Approval	CE				
Code	2 43 82 00	2 43 82 30	2 43 82 40	2 43 82 10	2 43 82 35

* Ambient temperature 25 °C, Target temperature 20 °C, Variations possible

** Ambient temperature 25 °C, Target temperature 20 °C with interior lighting switched on (15 W), Variations possible





Spark-free cabinets - EX series

Laboratory cabinets with a spark-free interior



Contents not supplied

The German guidelines „Working Safely in Laboratories BG-I 850-0“ stipulates that interior spaces must be explosion-protected where hazardous, explosive environments can develop (for example, due to the presence of flammable liquids).

The Lovibond® cabinets in the EX range meet the requirements of these guidelines and are fully equipped for daily laboratory use.

The cabinets consist of a sturdy sheet steel housing with impact-proof and jolt-resistant powder coating. Improved, robust, insulated housing and highly efficient components provide maximum energy efficiency.

The robust interior is made of high-quality, strong white plastic material (PS).

The door is lockable and supplied with a right-hand hinge as standard (but can easily be converted to a left-hand hinge). A tight door seal is ensured by an all-round magnetic gasket.

The temperature in the refrigerator can be continuously adjusted over the range +1°C to +15°C; a room thermostat ensures constant control. The digital temperature display enables the interior temperature to be easily read. The high performance fan provides for an even temperature distribution inside.

The models EX 220, EX 300 and EX 490 have a “fan stop” function, which switches the fan off when the door is opened.

Applications

- Laboratories
- Research Centres
- Universities

Technical data	EX 160	EX 220	EX 300	EX 490
Cooling	Powerful compressor unit, mounted on low noise, vibration-free bearings			
Coolant	R600a			
Defrost	Automatic defrost - condensation drains into a collection bowl within the refrigerator			
Temperature	1 °C to 15 °C			
Sound Power Level	47 dB			
Shelf loading capacity	40 kg			
EX-safety	Spark-free interior			
Height adjustment	Adjustable front feet			
Door	lockable, door hinges changeable			
Power supply	220 - 240 V / 50 Hz			
Shelf	4 (3 height-adjustable glass shelves)	5 (4 height-adjustable glass shelves)	6 (5 height-adjustable glass shelves)	
Connection value	1 A		1,5 A	
Power consumption	0,898 kWh / 24 h	0,786 kWh / 24 h	0,947 kWh / 24 h	0,983 kWh / 24 h
Climate class	SN, 10 °C bis 32 °C	SN-T, 10 °C bis 43 °C		
Temperature control	infinitely variable1 °C to 15 °C			
Inside dimensions (ca.)	513 W x 441 D x 702 H mm	470 W x 440 D x 1062 H mm	470 W x 440 D x 1452 H mm	600 W x 560 D x 1452 H mm
Overall dimensions (ca.)	600 W x 600 D x 860 H x mm	600 W x 610 D x 1250 H x mm	600 W x 610 D x 1640 H mm	750 W x 730 D x 1640 H mm
Net capacity	ca. 160 l	ca. 220 l	ca. 300 l	ca. 490 l
Weight	ca. 41,0 kg	ca. 53,0 kg	ca. 64,0 kg	ca. 84,0 kg
Approval	CE			
Code	2 42 21 05	2 42 21 15	2 42 21 25	2 42 21 35
Spares / Accessoires				
Safety- and collecting tub (PP)	42 21 55	42 21 56		42 21 57
Glass shelf	42 21 65	42 21 66		42 21 67

The product complies with the following
European directives and regulations: 2006/42/EC, 2006/95/EC, 94/9/EC, 2004/108/EC, 2011/65/EU.



Electrochemistry





SD 400 Oxi L
Page 138



SD 300 Serie
Page 140



SD 150
Page 144



SD 110
Page 146



SD Hand held meters
Page 148



Optical oxygen measurement SD 400 Oxi L



Measurement
of dissolved oxygen
at an advanced level



Applications

- Waste Water
- Water Treatment
- Marine Water
- Surface Water
- Drinking/ Potable Water

Users

- Sewage plants
- Medical research and development
- Institutes, Universities, Schools
- Water protection control
- Laboratories
- Aquaria

The SD 400 Oxi L allows the measurement of dissolved oxygen in a convenient and simple manner. The determination of dissolved oxygen in water is based on optical luminescence technology. This is characterized by fast response time and a particularly low maintenance requirement. Combined with high accuracy, this technology offers great benefits to the user.

Features of SD 400 Oxi L

For oxygen measurement by means of luminescence technology, the following advantages are obtained compared to galvanic sensors and Clark sensors:

- High accuracy
- No sample flow is needed
- Low maintenance
- No oxygen consumption in the measuring medium
- No pollution of ambient medium
- Long-life sensor membrane
- Robust measurement even in sulfide-containing samples

Additional features of SD 400 Oxi L

- Waterproof sensor IP 67
- Backlit LCD
- Internal data storage
- Software for monitoring and storage of data
- Micro USB port
- Comfortable fitting to BOD Karlsruhe NS 19 / 26 (16.4 mm Ø and above)



Data Transmission Kit



SD 400 Oxi L in case

SD 400 Oxi L

Probe	Optical DO
Protection class	IP 67 (sensor)
Display	Large LCD display
Data Memory	Micro SD-card
Data Logger	Software for monitoring and storage of data
Software	Included in instrument
Interface	Micro USB
Power off	After 10 minutes or manual off
Power Supply	Micro USB or 4 x AA batteries
Salinity	0... 50 ppt, auto compensation (after manual input salinity)
Response time	40 sec. to 90 % of final reading
Storage temperature	-5 °C to 50 °C
Working temperature	-5 °C to 50 °C
Dimensions	162 x 98 x 54 mm (L x W x H) instrument only
Weight	approx. 330 g (unit incl. batteries)
Languages	German, English, Italian, French, Spanish, Portuguese, Dutch, Chinese (simplified)

CE-Conformity

Technical Data

Measuring ranges

Oxygen	0 - 50 mg/l
- saturation	0 - 500 %
- temperature	-5 to 50 °C
- barometer	51 to 112 kPa

Resolution

Oxygen	0.01 mg/l
- saturation	0.1 %
- temperature	0.1 °C
- barometer	0.1 kPa

Accuracy

Oxygen	0 to 200 % or 0 - 20 mg/l: ± 1.0% of the reading or ± 0.1 mg/l whichever is greater > 200 % or > 20 mg/l: ± 10 % of reading - temperature ± 0.2 °C - barometer ± 0.2 %
---------------	--

Delivery Content

Order Code: 740000

SD 400 Oxi L, (Set 1)
instrument, 4 (AA) batteries,
optical DO probe with 1.5 m cable,
bottle for storage and calibration,
Micro SD Card with calibration data,
software and full user manual,
quick start guide and lanyard in case

Order Code: 740010

SD 400 Oxi L, (Set 2)
instrument, 4 (AA) batteries,
optical DO probe with 3 m cable,
bottle for storage and calibration,
Micro SD Card with calibration data,
software and full user manual,
quick start guide and lanyard in case

Order Code: 740020

SD 400 Oxi L, (Set 3)
instrument, 4 (AA) batteries,
optical DO probe with 10 m cable,
bottle for storage and calibration,
Micro SD Card with calibration data,
software and full user manual,
quick start guide and lanyard in case

Accessories

Code	Article
740060	Optical DO probe with 1.5 m cable and bottle for storage and calibration
740070	Optical DO probe with 3 m cable and bottle for storage and calibration
740080	Optical DO probe with 10 m cable and bottle for storage and calibration
740030	SD 400 Oxi L basic instrument
740090	Data Transmission Kit (consists of USB cable and wall mount adapter)
740100	Maintenance Kit (consists of membrane cap and Micro SD card with software and calibration data)
740110	Metal guard (for protection and weight in field-testing)
740120	Bottle for storage and calibration
740050	Carrying case with foam
197635	Cleaning cloth



SD 300 pH
SD 310 Oxi
SD 320 Con



Applications

- Drinking Water
- Cooling/Boiler Water
- Waste Water
- Pool Water
- Surface Water
- Laboratory

Features		
SD 300 pH	SD 310 Oxi	SD 320 Con
Additional Display for pH Electrode 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 • "mV_H" Conversion to hydrogen systems according to DIN38404 Part 66 rH Measurement The rH value is calculated from a measured Redox value and a manually input pH value	Measurement of: Oxygen partial pressure, Oxygen Concentration, Oxygen Saturation, Temperature measurement Automatic absolute air pressure measurement Easy calibration against oxygen in air Sensor evaluation Salinity correction Self-polarising galvanic oxygen probe, allows instant measurement after system is switched on	Salinity measurement Salinity means the sum of amount of all dissolved salts in water. The unit is g / kg. TDS measurement (total dissolved solids) TDS means the mass concentration of dissolved media in a liquid. The unit is mg/l. 5 Ranges Determination of resistivity 4 Cell constants values
Min / Max Value Memory Automatic Temperature compensation Auto Power Off (0 - 120 min) Low Battery Display Alarm Function Auto Hold Function Shock-absorbing rubber protective armouring Waterproof IP 67 Data Logger and Software		



SD 300 pH in case



SD 310 Oxi in case



SD 320 Con in case

Accessories from page 150



Technical Data	SD 300 pH	SD 310 Oxi	
Measuring ranges	pH: -2.000 ... 16.000 pH Redox: -2000 ... +2000 mV Temperature: -5,0 ... 150,0 °C rH: 0.0 ... 70.0 rH	O ₂ -concentration: 0.0 ... 70.0 mg/l O ₂ -partial pressure: 0 ... 1200 hPa O ₂ O ₂ -saturation: 0,0 ... 600,0 % Ambient air pressure: 10 ... 1200 hPa abs. Electrode temperature: 0,0 ... 50,0 °C Operating pressure (sensor): max. 3 bar Δ 30 m water depth	
Accuracy	pH: ± 0.005 pH Redox: ± 0.05 % FS Temperature: ± 0.2 °C (- 5.0 ... + 100.0 °C) rH: ± 0.1 rH	O ₂ -concentration: 0 ... 25 mg/l ± 1.5 % ± 0.2 mg/l 25 ... 70 mg/l ± 2.5 % ± 0.3 mg/l Ambient air pressure: 3 hPa bzw. 0,1 % v. Mw. (higher value relevant) Sensor Temperature: ± 0.1 °C	
Auto-Off	0 - 120 minutes		
Electrode connections	pH, Redox: BNC-plugs, standard BNC-plugs and waterproof BNC-plugs	7 pin bayonet connection	
Interface / Supply	4 pin bayonet connection for serial interface and supply (USB 300)		
Display	LCD, 4.5 digit seven-segment display (switchable)		
Data storage	cyclically: 10000 data sets (cyclus 1 Sec. ... 60 min) single: 1000 data sets		
Calibration	automatically or manually (1-, 2- or 3-point calibration)	automatically (1-, 2- or 3-point calibration)	
Power supply	2 x AAA batteries (included)		
Additional functions	min/max-value, hold-function		
	salinity correction 0.1 ... 70 PSU		
Reference temperature	25 °C		
Alarm function	adjustable (min/max limit)		
Display	evaluation of battery and electrode status real time clock		
Conditions			
Working conditions	-25 ... - 50 °C; 0 ... - 95 % relative density (non-condensing)	Electrode: 0 ... +40 °C / Instrument: -25 ... +50 °C; 0 ... 95 % relative density (non-condensing)	
Storage temperature	-25 ... +70 °C	Electrode: 0 ... +60 °C Instrument: -25 ... +70 °C	
Dimensions	164 x 128 x 37 mm (L x B x H)	164 x 98 x 37 mm (L x B x H)	
Weight	ca. 287 g incl. battery and protective armouring		
Armouring	shock-absorbing ABS-armouring		
Protection class	IP 67 (housing and connections)		
Conformity	CE		

SD 320 Con	
Conductivity: (depending on cell constant of measuring cell)	0,000 ... 1000 mS/cm (display area)
Cell:	LC 12 (to 200 mS/cm; cell constant: approx. 0,55 cm ⁻¹) LC 16 (to 1000 mS/cm; cell constant: approx. 0,42 cm ⁻¹) Ultrapure water (0 ... 200 µS/cm; cell constant: ca. 0,1 cm ⁻¹)
Resistivity:	0.005 ... 500 kOhm*cm (depending on cell constant)
TDS:	0 ... 5000 mg/l (depending on cell constant)
Salinity:	0.0 ... 70.0 PSU (Practical Salinity Unit)
Temperature:	-5.0 ... +100 °C
Conductivity:	±0.5 % v. Mw ±0.1 % FS (depends on electrode)
Temperature:	±0.2 °C (-5.0 ... +100.0 °C)
0 - 120 minutes	
7 pin bayonet connection	
4 pin bayonet connection for serial interface and supply (USB 300)	
LCD, 4.5 digit seven-segment display (switchable)	
cyclically: 10000 data sets (cyclus 1 Sec. ... 60 min) single: 1000 data sets	
automatically or manually	
2 x AAA batteries (included)	
min/max-value, hold-function	
Adjustment of the temperature input	
20 or 25 °C, adjustable	
adjustable (min/max limit)	
evaluation of battery	
real time clock	
-25 ... +50 °C; 0 ... 95 % relative density (non-condensing)	
-25 ... +70 °C	
164 x 128 x 37 mm (L x B x H)	
ca. 287 g incl. battery and protective armouring	
shock-absorbing ABS-armouring	
IP 67 (housing and connections)	
CE	

Delivery Content

SD 300 pH

Order Code: 72 46 10

SD 300 pH (Set 1)

instrument, batteries, pH/temp. plastic-electrode type 231, pH-buffer-set (pH 4.01/7.00/10.01), in case, manual, warranty information in case
Order Code: 72 46 11

SD 300 pH (Set 2)

instrument, batteries, but with pH / temperature plastic-electrode type 226, temperature sensor Pt1000, manual, warranty information in case
Order Code: 72 46 00

SD 300 pH (basic unit)

without electrode, with batteries, protective armouring, instruction manual, warranty information in case

SD 310 Oxi

Order Code: 72 46 50

SD 310 Oxi (Set 1)

instrument, batteries, oxygen sensor with 1.5 m cable, electrolyte solution (KOH) 100 ml and 2 pcs. spare membrane heads, instruction manual, warranty information in case

Order Code: 72 46 60

SD 310 Oxi (Set 2)

instrument, batteries, but with oxygen sensor with 10 m cable, electrolyte solution (KOH) 100 ml, spare membrane heads (2 pcs.), instruction manual, warranty information in case

Order Code: 72 46 65

SD 310 Oxi (Set 3)

instrument, batteries, but with oxygen sensor with 30 m cable, electrolyte solution (KOH) 100 ml, spare membrane heads (2 pcs.), instruction manual, warranty information in case

SD 320 Con

Order Code: 72 47 00

SD 320 Con (Set 1)

instrument, batteries, conductivity cell LC 12 (measuring range 0 - 200 mS/cm), manual, warranty information in case

Order Code: 72 47 20

SD 320 Con (Set 2)

instrument, batteries, conductivity cell LC 16 (measuring range 0 - 1000 mS/cm), manual, warranty information in case

Order Code: 72 47 10

SD 320 Con (Set 3)

instrument, batteries, pure water conductivity cell (measuring range 0 - 100 mS/cm) manual, warranty information in case

 **Accessories from page 150**



SensoDirect 150



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

All measured values can be conveniently read on the large LCD display

Applications

- Drinking Water
- Cooling/Boiler Water
- Waste Water
- Pool Water
- Surface Water
- Water Treatment Companies
- Industrial and Governmental Laboratories

Technical Data SD 150

Parameter	pH	ORP	Oxygen	Conductivity	TDS	Temperature
Range / Resolution	0.00 ... 14.00 pH	-1999 ... 1999 mV	O ₂ dissolved: 0.0 ... 20.0 mg/L Air O ₂ : 0.0 ... 100.0 %	0.0 ... 200.0 µS/cm 0.200 ... 2.000 mS/cm 2.00 ... 200.00 mS/cm 200.0 ... 2.000.0 mS/cm	0.0 ... 132.0 ppm 132 ... 1320 ppm 1320 ... 13200 ppm 13200 ... 132000 ppm	0.0 ... 60.0 °C 32.0 ... 140.0 °F
Accuracy	± 0.02 pH	± 0.5% of measured value	O ₂ dissolved: ± 0.4 mg/L Air O ₂ : ± 0.7 %	± 2 % of measured value		± 0.8 °C ± 1.5 °F
Temperature compensation	automatically (with temperature electrode) and manually	-	automatically	adjustable: 0... 5.0 % / °C		-
Calibration	(1-, 2- or 3-point calibration (automatically or custom))	1-point calibration (custom, standards only > +100 mV)	1-point calibration (automatically)	1- or 2-point calibration, manually		-
Standards for automatic detection	USA: 4.01 / 7.00 / 10.01 pH	-	oxygen content air	-		
Salinity correction	-		0 ... 39 %, manually	-		
Air Pressure compensation	-		0 ... 8900 m, manually	-		
Display	58 x 34 mm LCD					
Data-Hold-Function	Yes					
Automatic Power Off	after 10 min, optional					
Operating conditions	0 ... 50 °C, 0 ... 80 % relative density (non-condensing)					
Power Supply	4 x 1.5 V batteries AA or DC 9V adapter					
Weight	ca. 620 g (battery and protective armouring)					
Dimensions	203 x 76 x 38 mm (battery and protective armouring)					
Protection class	IP 51					
Conformity	CE					
Order Info Sets:						
Set 1	724200	✓	-	✓	✓	✓
Set 2	724210	✓	-	✓	✓	✓
Set 3	724220	✓	-	-	-	✓
Set 4	724230	✓	✓	-	-	✓

Delivery Content

All Sets include:

- Sturdy plastic case
- Measuring instrument with protective armouring
- 4 x 1.5 V batteries AA
- pH electrode type 226
- Temperature probe Pt1000
- pH 4.01 and 7.00 buffer set (90 ml each)
- Instruction manual

SensoDirect 150 Set 1

- pH / Con / TDS / O₂ dissolved / Temp.
- Conductivity probe type 110/150
- Oxygen sensor type 150
- Electrolyte and membrane heads (2 pc.)

SensoDirect 150 Set 2

- pH / Con / TDS / Temp.
- Conductivity probe type 110/150

SensoDirect 150 Set 3

- pH / O₂ dissolved / Temp.
- Oxygen sensor type 150
- Electrolyte and membrane heads (2 pc.)

SensoDirect 150 Set 4

- pH / Redox / Temp.
- Redox electrode type 242

 **Accessories from page 150**



SensoDirect 110



Battery operated pH meter for the determination of pH, Salinity and Conductivity.
Variety of applications and user-friendly in operation.

The protective armoured offers not only a secure grip but also protection against fall damage.
A "Hold" function and an automatic battery check rounds off the range of functions.



Delivery Content

- Basic unit
- Battery
- Protective armouring
- Warranty information
- Instruction manual

Applications

- Drinking Water
- Cooling/Boiler Water
- Waste Water
- Pool Water
- Surface Water
- Water Treatment Companies
- Industrial and Governmental Laboratories

Technical Data	SensoDirect 110 pH	SensoDirect 110 Con	SensoDirect 110 Salt
Range / Resolution	0.00 ... 14.00 pH	0.000 ... 1.999 mS/cm 0.01 ... 19.99 mS/cm	0.01 ... 10.00 % salt
Accuracy	± 0.07 pH	± 3 % range	± 0.5 % range
Temperature compensation	-	automatically, 2 % / °C	
Calibration	custom (manually with adjusting screws)		
Display	52 x 37 mm LCD		
Data-Hold-Function	Yes		
Operating conditions	0 ... 50 °C, 0 ... 80 % rel. humidity (non condensing)		
Power Supply	9-V-Block Battery		
Weight	ca. 380 g (battery and protective armouring)		
Dimensions	208 x 110 x 34 mm (protective armouring)		
Protection class	IP 51		
Conformity	CE		
Order Info			
Instrument, electrode and accessories in stable case	721300	722300	723300
Instrument and electrode	721310	722310	-

➔ Accessories from page 150



SD-Hand-held meters

Technical Data	SD 50 pH	SD 60 ORP
Range / Resolution	0.00 ... 14.00 pH	-1000.0 ... +1000.0 mV -1800 ... +1800 mV
Accuracy	± 0.05 pH	± 2 mV
Calibration	1-, 2- or 3-point calibration (automatically)	1-point calibration (custom)
Standards for automatic recognition	USA: 4.01 / 7.00 / 10.01 pH NIST: 4.01 / 6.86 / 9.18 pH	-
Temperature: Range / Resolution	0,0 ... 60,0 °C / 32,0 ... 140 °F	
Temperature: Accuracy	± 1 °C / ± 1,8 °F	
Auto-off	8 minutes non-use	20 minutes non-use
Temperature compensation	automatically	-
Battery life	> 350 hours (backlight OFF)	
Display	22 x 22 mm LCD, with backlight	
Memory	25 data sets with time and date	
Data-Hold-Function	Yes	
Operating conditions	0 ... 60 °C / 0 ... 80 % rel. humidity (non condensing)	
Power supply	2 x 1.5 V batteries, AAA	
Dimensions, Weight	205 x 44 x 33 mm, approx. 155 g with batteries	
Conformity	CE	
Order Info		
Instrument and Accessories in plastic box	194800-16	194801-16
Instrument and Accessories in case	194800-30	-
Replacement electrode	194820	194821

The **SD series** comprises a range of compact, easy-to-use, hand-held instruments for the accurate measurement of pH, ORP, Con, TDS or Salt. With robust housing and fully waterproof (IP 67) casing, these testers are the ideal solution for in-situ testing in environmental, industrial or pool & spa applications.

The intuitive scroll-bar functionality and backlit display enable the easy measurement and simultaneous display of Result, Temperature, Date/Time and other Parameters.

With 25 sets of data storage, each with date and time stamp, the units also enable the easy recalling of data for record keeping requirements.

Designed and manufactured according to Lovibond® quality standards, the instruments are equipped with replaceable electrodes to ensure long-life functionality in the field.

Delivery Content

- Meter in a robust plastic case
- 2 x 1.5 V Batteries, AAA
- Hanging tab
- Instruction manual
- pH 4.01; 7.00 and 10.01 Buffer tablets 3 x 10 St. (SD 50 pH only)
- pH 4.01 and 7.00 Calibration buffer and 2 x 100 ml measuring cup (SD 50 pH in case only)

Conversion table

1 mS/cm	=	1000 µS/cm
1 ppt	=	1000 ppm
1 %	=	0,1 ppt
1 ppt	≈	1 g/L
1 ppm	≈	1 mg/L
ppt	-	Parts per thousand
ppm	-	Parts per million



SD 70 Con	SD 80 TDS	SD 90 Salt/Salz
0 ... 1999 µS/cm 2.00 ... 20.00 mS/cm	0 ... 1499 ppm 1.50 ... 15.00 ppt	0 ... 999 ppm 1.00 ... 20.00 ppt 0.00 ... 2.00 %
± 3 % range		
1- or 2-point calibration (automatically or custom)	1- or 2-point calibration (custom)	
1413 µS/cm and 12.88 mS/cm	-	-
0.0 ... 60.0 °C / 32.0 ... 140 °F		
± 1 °C / ± 1.8 °F		
8 minutes non-use		
automatically, 2 % / °C		
> 100 hours (backlight OFF)		
22 x 22 mm LCD, with backlight		
25 data sets with time and date		
Yes		
0 ... 60 °C / 0 ... 80 % rel. humidity (non condensing)		
2 x 1.5 V batteries, AAA		
205 x 44 x 33 mm, approx. 155 g with batteries		
CE		
194802-16	194803-16	194804-16
-	-	-
194822		



Accessories SD Instruments

Accessories SD Instruments									
Electrodes	Item	SD 50 pH	SD 60 Redox	SD 70 Con	SD 80 TDS	SD 90 Salt	SensoDirect 110 pH	SensoDirect 110 Con	SensoDirect 110 Salt
	pH Electrode type 231, plastic/gel/temperature (NT C 30 kOhm)								
	pH Electrode type 226, plastic/gel, universal use even at low conductivities					•			
	pH Electrode type 330, plastic/gel, universal use					•			
	pH Electrode type 235, glass/gel, for laboratory applications					•			
	SD 50 pH replacement electrode with temperature probe, universal use	•							
	Redox Electrode type 240, plastic/gel, universal use								
	Redox Electrode type 242, plastic/gel, universal use								
	SD 60 Redox replacement electrode, universal use		•						
	Conductivity probe LC 12 (K = 0.55), 4-pole graphite, temperature probe NTC 10K incl. , universal use up to 200 mS/cm								
Conductivity probe LC 16 (K = 0.42), 4-pole graphite, temperature probe Pt 1000 incl., universal use up to 1000 mS/cm									
Pure water conductivity probe (K = 0.1), 2-pole stainless steel, temperature probe NTC 10K incl., low conductivities up to 200 µS/cm									
Conductivity probe type 110/150 (K = 1.0), 2-pole graphite, universal use						•			
Probe for salt type 110 (K = 1.0), 2-pole: graphite, universal use								•	
SD 70/80/90 replacement electrode, (K = 1.0), 2-pole: graphite, universal use			•	•	•				
Oxygen sensor, galvanic, Pt/Pb, cable length: 1.5 m									
Oxygen sensor, galvanic, Pt/Pb, cable length: 10 m									
Oxygen sensor, galvanic, Pt/Pb, cable length: 30 m									
Oxygen sensor type 150, polarographic, Au/Ag, universal use, cable length: 4m									
Temperature probe Pt 1000, jack plug									
Temperature probe Pt 1000, banana plug									

	SensDirect 150	SD 300 pH	SD 310 Oxi	SD 320 Con	Code
	• SET 1				721231
•	• SET 2				721226
•					721330
•	•				721235BNC
					194820
	•				721240BNC
•					721242
					194821
			• SET 1		19805040
			• SET 2		19805045
			• SET 3		19805046
•					724400
					724430
					194822
		• SET 1			19805050
		• SET 2			19805051
		• SET 3			19805052
•					724410
•					724420
	• SET 2				721245



Accessories SD Instruments

Standards

Item	SD 50 pH	SD 60 Redox	SD 70 Con	SD 80 TDS	SD 90 Salt	SensoDirect 110 pH	SensoDirect 110 Con	SensoDirect 110 Salt
pH 4.01 calibration buffer (traceable to N.I.S.T), 90 ml	•					•		
pH 7.00 calibration buffer (traceable to N.I.S.T), 90 ml	•					•		
pH 10.01 calibration buffer (traceable to N.I.S.T), 90 ml	•					•		
pH 4.01 / 7.00 / 10.01 calibration buffer-set (traceable to N.I.S.T), 90 ml each	•					•		
pH 4.01 calibration buffer (traceable to N.I.S.T), 1 l	•					•		
pH 7.00 calibration buffer (traceable to N.I.S.T), 1 l	•					•		
pH 10.01 calibration buffer (traceable to N.I.S.T), 1 l	•					•		
pH 4 buffer tablets, 100 pcs.	•					•		
pH 4 buffer tablets, 250 pcs.	•					•		
pH 7 buffer tablets, 100 pcs.	•					•		
pH 7 buffer tablets, 250 pcs.	•					•		
pH 10 buffer tablets, 100 pcs.	•					•		
pH 10 buffer tablets, 250 pcs.	•					•		
470 mV redox standard solution, 100 ml		•						
1413 µS/cm conductivity calibration solution (traceable to N.I.S.T), 500 ml			•				•	
988 ppm TDS calibration solution / 1413 µS/cm conductivity calibration solution, 100 ml				•				
9.02 ppt TDS calibration solution / 12.89 mS/cm conductivity calibration solution, 100 ml				•				
0.1 % salt calibration solution (NaCl), 100 ml					•			
0.5 % salt calibration solution (NaCl), 100 ml					•			
Service-Set oxygen sensor SD 310 Oxi, 3 spare membrane heads, KOH electrolyte (100 ml)								
KOH Spare electrolyte (100 ml)								
Spare membrane for oxygen sensor, 1 pc.								
Spare electrolyte for oxygen sensor, 30 ml								
Protection cap oxygen sensor for depth measurements, PVC								
Protection cap oxygen sensor for depth measurements, brass								
DC 9V power supply								
Storage solution pH/ORP-Electrodes, 3 M KCl, 25 ml	•	•				•		
Storage solution pH/ORP-Electrodes, 3 M KCl, 100 ml	•	•				•		
Deionised water (DI), 100 ml	•	•	•	•	•	•	•	•
Measuring beaker made of polypropylene, transparent, 100 ml	•	•	•	•	•	•	•	•
USB cable for data transfer								
GSOFT 3050, Windows-Software (Data logger, Data transfer)								
Case with foam for SD 150								
Case with foam for SD series								
9-V-Block battery, 1 pc.						•	•	•
1.5 V batteries AA, 2 pcs.								
1.5 V batteries AAA, 4 pcs.	•	•	•	•	•			

Miscellaneous

	SensDirect 150	SD 300 pH	SD 310 Oxi	SD 320 Con	Code
•	•				721247
•	•				721248
•	•				721249
•	•				721250
•	•				721252
•	•				721254
•	•				721256
•	•				515620BT
•	•				515621BT
•	•				515610BT
•	•				515611BT
•	•				515600BT
•	•				515601BT
•	•				195070
•			•		722250
•			•		467642
•			•		467643
					467631
					467621
		•			724670
		•			19801130
•					724460
•					724470
		•			19805055
		•			19805056
•					724540
•	•				726402
•	•				726404
•	•	•	•		461275
•	•	•	•		384801
	•	•	•		724620
	•	•	•		724625
•					725050
	•	•	•		725060
					1950012
•					1950010
	•	•	•		1950026

The background of the slide is a close-up, artistic rendering of numerous blue, rod-shaped bacteria. The bacteria are oriented in various directions, creating a sense of depth and movement. They are set against a dark blue gradient background. A semi-transparent, light purple rectangular box is positioned in the upper left quadrant, containing the word 'Microbiology' in a dark blue, cursive script font.

Microbiology



Dipslides
Page 156



DI 10 Incubator
Page 156



Dipslide App
Coliform Test Kit
Page 157



Legionella Test Kits
Page 158



Dipslides

Determine aerobic and anaerobic bacteria levels.

- Early indication of bacteria
- Proliferation results in 48 hours
- Inexpensive
- Easy-to-Use
- Excellent for trend analysis

Guidelines to advise on the correct practices to control germs in water systems exist worldwide. Suppressing bacteria levels does substantially reduce the possibility of an outbreak of this often fatal disease. Guidelines recommend introducing a monitoring and control program. This program includes the testing of cooling tower waters with dipslides on a regular basis.

A full range of dipslides is available for semi-quantitative determination of aerobic and anaerobic bacteria populations in industrial and recreational waters. Dipslide accuracy is limited due to the small sample size, but if used correctly and incubated at a constant temperature using the Lovibond® dipslide incubator, they are excellent for trend analysis and can give an early indication of bacteria proliferation.

Dipslides are supplied in a cardboard carton containing 10 slides.

Dipslides have a working shelf life of 6 months.

Results are quantified by comparison to a standard density chart.



DI 10 Incubator for Dipslides

- Robust design
- Holds up to 12 dipslides
- Excellent temperature stability
- In-car operation
- Programmable incubation period setting

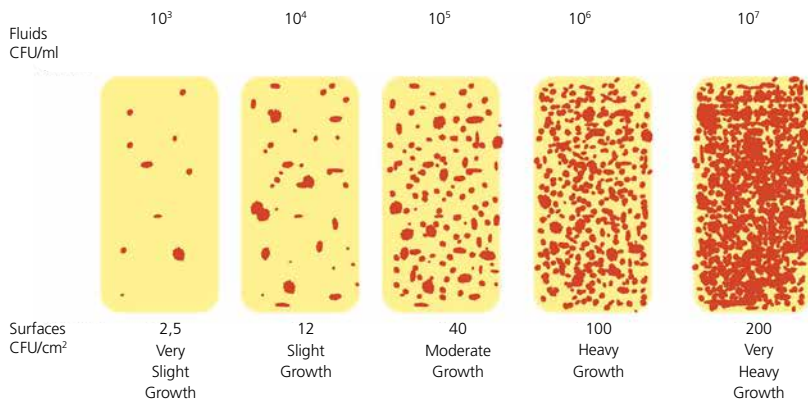
The Lovibond® DI 10 Incubator is designed for the reliable incubation of bacteriological slides, on-site, in a laboratory or even while mobile in a car or van.

National and European guidelines give practical advice on how to monitor, clean, test and ultimately control harmful legionella bacteria in water systems.

Dipslides provide a crucial part in the testing program, but must be used correctly and regularly as part of a planned regime, week on week to be of any meaningful value.

The incubation period and the incubation temperature should be the same each time the test is performed so that bacteria growth is controlled and consistent each time the test is performed. This allows for week by week comparisons to be made and high counts easier to identify. Dipslides are usually incubated at 30°C for 48 hours, but this can vary depending upon the specific application.

The Lovibond® DI 10 Incubator, when used in conjunction with dipslides, enables effective microbiological monitoring of cooling water in accordance with the many European guidelines.



Code	Dipslide	Anwendung	Growth
56B010110	D001 TTC/TTC	TVC (Aerobic bacteria)	Red
56B010210	D002 TTC/MALT	TVC/Fungi & Moulds	Red/Green, Black, White: Beige (Yeast)
56B010310	D003 TTC/ROSE	TVC/Fungi & Moulds	Red/Green, Black, White: Beige (Yeast)
56B010410	D004 TTC/MAC	TVC/Coliforms	Red/Red or Yellow
56B010510	D005 TTC/E.COLI	TVC/ Coliforms & E.coli	Red/ Red or Yellow (Coliforms) or Blue (E.coli) or Cream (Paeruginosa)
56B010610	D006 MAC/PDM	Coliforms/ Pseudomonas	Red/Green (Paeruginosa) or Cream (Pspp)
56B010710	D007 TTC/PDM	TVC/ Paeruginosa	Red/ Green (Paeruginosa) or Cream (Pspp)
56B010810	D008 SRB Tube Test	Sulphate Reducing Bacteria	Black Diffusion
56B010910	D009 NRB Tube Test	Nitrite Reducing Bacteria	Pink Diffusion
56B011110	D011 R2A/R2A	Aerobic bacteria	Red

Order code 56B000701



Lovibond® Dipslide Comparator App

This easy-to-use app offers a choice of different media-specific comparison pallets to qualify the results, suitable for the entire range of Lovibond® Dipslides.

The app can also be used to capture and quantify all results of the NRB and SRB dipslides.

Easy to use

The app offers a simple but effective method for taking pictures and evaluating a dipslide. The evaluation is done visually with an adjacent colour media-specific quantification palette that can be easily moved. This allows the operator a direct comparison.

There is the ability to load any number of customer addresses with a drop-down menu for easy access.

Information screens provide solutions to frequently asked questions. Automatically, all entered data is graphically displayed on site basis.

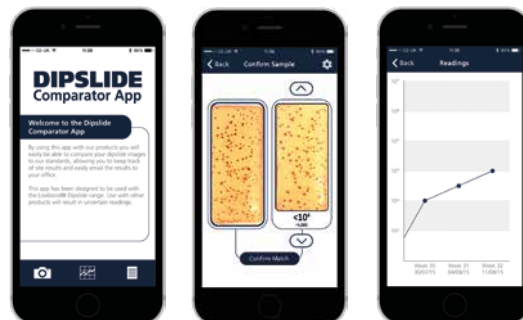
Fast e-mail option

All photographically recorded results are stored for a period of 90 days.

The photo of the "compared" dipslide can be sent to one or more e-mail addresses for archiving.

As a result, the compliance is improved because the dipslide result is retrieved at any time and can be displayed.

The charts of historical results can be viewed and emailed to customers.



The Lovibond® app can be downloaded from Apple and Android™ stores.

After downloading the app, the user must enter the Dipslide batch number to enable use.



iOS® is a registered trademark of Cisco, Inc. and licensed to Apple, Inc.

Android™ is a trademark of Google Inc.

Coliform / *E.coli* Test Kit

- Simple one step procedure
- Coliforms and *E.coli* in one test
- 100ml sample (regulatory reporting)
- Captures a CFU / 100 ml within 24 h



Coliform and *E.coli* are good indicators of general bacterial contamination and, because they are easy to test for, make ideal indicator bacteria to monitor in water courses, tanks and pipe work. WHO guidelines on potable water quality state that zero Colony Forming Units (CFU) of coliforms and *E.coli* should be present per 100ml of water sample.

The Lovibond® system tests 100ml samples and will indicate the presence of just one CFU/100 ml.

The presence of only one CFU / 100 ml is indicated by a yellowish staining under UV light within 24 h.

Code: 56K009701

(Further details on this product can be found in our special catalog "Industrial Water")



The **DI 20 incubator** with standard built-in heating and cooling system, is suitable for incubating up to 20 tests.

➔ you will find further information on **page 163**



Lovibond® *Legionella* Rapid Test Kits

The Lovibond® *Legionella* Test Kits all contain the fast and accurate test strip, designed to obtain results in 25 mins.

This test is used to detect the presence of *Legionella pneumophila* serogroup 1 bacteria in water samples from a wide range of sources.

The test operates via a Lateral Flow Immuno-chromatographic Assay (LFICA).

The test strip has an 18month shelf life from manufacture and is intended for storage at room temperature. 18–22°C (64.4–71.6°F)

The test kits are intended for use as part of an overall water treatment, management and risk reduction approach and, as all testing methods including lab culture testing, should NOT be used as the sole method for assessing risks associated with *Legionella* bacteria.

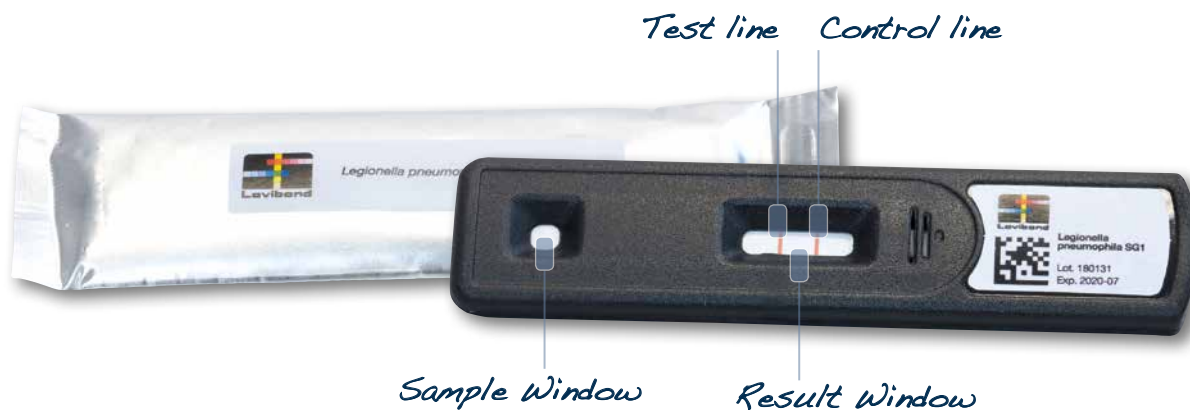
The simple design of the test kit ensure that the test can be used by non technical personnel with little or no training required

Each of the kits have been designed to meet requirements of application and geographical areas.

EU test kits all come with score cards to determine action level:

score of 1 or greater is ≥ 1000 CFU/l

score of 6 or greater $= \geq 10,000$ CFU/l



Test Kit	Applications	Limit of detection	No of Tests	Code
Field Test Kit	Basic Test, no Filtration	100,000 CFU/l	10	56B006001
Industrial Test Kit	Industrial water	100 CFU/l	5	56B006101
Industrial EU Kit	Industrial water	1000 / 10000 CFU/l	5	56B006106
Industrial Test Kit Refill Pack	Industrial water	100 CFU/l	5	56B006104
Risk Assessment Test Kit	Industrial water	100 CFU/l & 200 CFU/l / Swabbed area	4	56B006501
Risk Assessment EU Test Kit	Industrial water	1000 / 10000 CFU/l & 200 CFU/l / Swabbed area	4	56B006107
Single Syringe Test Kit	Potable Water	100 CFU/l	1	56B006601
Single Syringe EU Test Kit	Potable Water	1000 / 10000 CFU/l	1	56B006105
Swab (Biofilm) Test Kit	Biofilm	200 CFU/l / Swabbed area	5	56B006401
Single Swab Test Kit	Biofilm	200 CFU/l / Swabbed area	1	56B006108



Industrial Legionella Test Kit



Risk assessment Kit



Swab Legionella Test Kit

Applications

- Domestic & industrial hot & cold water systems
- Cooling towers
- Decorative fountains, hot tubs & pools
- Sinks and showers
- Mistlers, sprinklers, air washers & humidifiers
- Risk assessment

User

- Risk Assessors
- Water Treatment Company
- Facilities Management Company
- Leisure Facility Operator
- Swimming Pool Engineer

Water Safety Kits





Water Safety Kits
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DI 20 Incubator
Page 163



Water Safety Kits

Potable Water Test Kits

Clean water is essential for human health and the Tintometer® Group is dedicated to ensure we can deliver technical solutions for testing, wherever they may be needed.

Complete Tintometer® Potable Water Test Kits

The Lovibond® Potable Water Test Kits are designed for both microbiological and physio chemical analysis of some of the most critical parameters to determine the suitability of water for drinking.

Their rugged cases with a compact and light-weight design are lockable, waterproof and simple to use. These kits can be used in the field by non technical personnel quickly and easily and so are perfect for emergency response situations.

All kits come with simple pictorial instructions.



Applications

- Drinking water monitoring
- Drinking water supply
- Emergency Response
- Water purifier

User

- Non Profit Organizations (NGO's)
- Medical research and development
- Institutes, Universities, Schools
- World Health Organization (WHO)

Analysis	Range	Measuring Instrument	No. of tests	Key Features	Code
Basic Kit					56K681250
Chlorine	0 - 3mg/l Cl	Pooltester	250	Emergency Response Kit	
Coliform	>1CFU / 100ml	Plate Count	200	Contains Basic and Simple	
Conductivity	0.01 - 20.00 mS	Pocket Meter SD 70 Con	> 250	Tests for Indicative Tests	
<i>E. Coli</i>	>1 CFU / 100ml	Plate Count	250	Chemical and Microbiological	
pH value	6.2 - 8.2	Pooltester	250	Analysis in one Kit	
Turbidity	30 - 300 NTU	Tube test			
Deluxe Chemical Kit					56K681253
Ammonia	0.02 - 1mg/l N	Photometer MD 600	250	Chemical Constituent Kit	
Chlorine	0 - 4mg/l Cl	Photometer MD 600	250	for potable water	
Conductivity	0.01 - 20.00 mS	Pocket Meter SD 70 Con	250	Contains accurate Indicative Tests	
Nitrate	0.08 - 1mg/l N	Photometer MD 600	250		
pH value	0 - 14	Pocket Meter SD 50 pH	250		
Turbidity	0.01-1100 NTU	Turbidimeter TB 211 IR	> 250		
Deluxe MicroBiology Kit Single Incubator		DI 20 Incubator (1 Incubator)			56K681254
Coliform	>1 CFU / 100ml	Plate Count	200	Microbiological testing in a single case	
<i>E. Coli</i>	>1 CFU / 100ml	Plate Count	200	Simple pictographic design of DI 20	
Deluxe MicroBiology Kit Double Incubator		DI 20 Incubator (2 Incubators)			56K681255
Coliform	>1 CFU / 100ml	Plate Count	200	Microbiological testing in a single case	
<i>E. Coli</i>	>1 CFU / 100ml	Plate Count	200	Simple pictographic design of DI 20	
				Allows simultaneous measurement of thermo tolerant species	

Potable Water Kit Basic

The Lovibond® Basic Potable Water Test Kit is ideal for emergency situations and disaster relief efforts and combines microbiological methods and simple chemical methods of analysis.

The kit can also be used for surveillance and monitoring of water quality at the source, in water storage tanks, in treatment plants, at the consumer level etc.

Its compact design and simplistic tests ensure that the most common tests used for indication of potability are performed rapidly and simply

This test kit incorporates our rapid poolchecker for Chlorine / pH , our pocket conductivity meter, a simple turbidity tube and our DI 20 incubator for testing *E. Coli* and Coliform into one case. This allows the kit to be transported easily and used in areas that are otherwise difficult to test in.

Deluxe Potable Water Chemical Kit

The Lovibond® Deluxe Potable Water Chemical Kit combines some of the most popular Tintometer® water analysis products into one case designed for the analysis of chemical constituents that indicate the potability of water and its effective safety for human consumption.

It comprises our MD 600 photometer , TB 250 IR turbidity meters and SD 50 AND SD 70 pocket electrochemistry meters.

This kit can be used in conjunction with the Deluxe microbiology cases to provide a complete suite of tests for potability of water.

The kit comes with reagents for Chlorine, Ammonia, Nitrite , Nitrate , ph , Conductivity , Turbidity but can be expanded using our reagent packs featured from pages 88 to include any of the tests for the MD 600.

Deluxe Potable Water Microbiology Kits

The Lovibond® Deluxe Potable Water Microbiological Test Kits contains all the equipment necessary to perform the microbiological analysis component for safe drinking water.

The kits can also be used for surveillance and monitoring of water quality at the source, in water storage tanks, in treatment plants, at the consumer level etc.

The kits are available with 1 or 2 DI 20 incubators.

The Double Microbiological Deluxe Kit allows the simultaneous measurement of *E. Coli* / Coliforms and thermo-tolerant *E. Coli* / Coliforms which require two separate incubation temperatures.

These kits can be used in conjunction with the Deluxe Chemical Kit to complete a superior suite of tests for water potability

This test kit incorporates our new DI 20 incubator, vacuum filtration, re-useable stainless steel micro plates.

DI 20 Incubator



Technical Data

Voltage input	12v DC, 4Amps
Power leads	UK, EU, USA and Battery
Operating Temperature	5°C – 50 °C
Incubation temperature	20 °C - 47°C
Temperature resolution	0.1°C
Temperature Accuracy	+/- 0.5 °C
Dimensions	116 x 165 x 116 mm
Weight	approx. 600g
Time to reach temperature	30 min. max

Code: 56B000714

(DI 20, Power leads, 50 Petri dishes, Power Supply)

Accessoires

Code	Article
197139	Petri Dish Holder
400855	Petri Dishes, 10 pc.
19803550	Power Pack
136300	Power Cable Set
190630	USB Cable
192340	Lead Acid Battery
197259	Battery Cable

Our new DI 20 incubator has been designed to allow the user to reach global drinking water standards for testing, even in difficult environments.

The DI 20 incubator is a high quality, portable, lightweight incubator for microbiological testing of water using plates. It is the only incubator of its type to come with heating and cooling as standard ensuring the samples are incubated at the correct temperature no matter what ambient conditions.

Its innovative design also includes a small petri dish holder utilising our re-usable stainless steel micro plates, the dishes allow each incubator to perform up to 20 tests.

Its sleek design and intuitive pictographic buttons ensure that it can be used with little or no training and its LED lights allow users to see at a glance how far through a cycle the incubation is, and that the temperature is stable.

Pool Analytics





Pooltester
Page 168



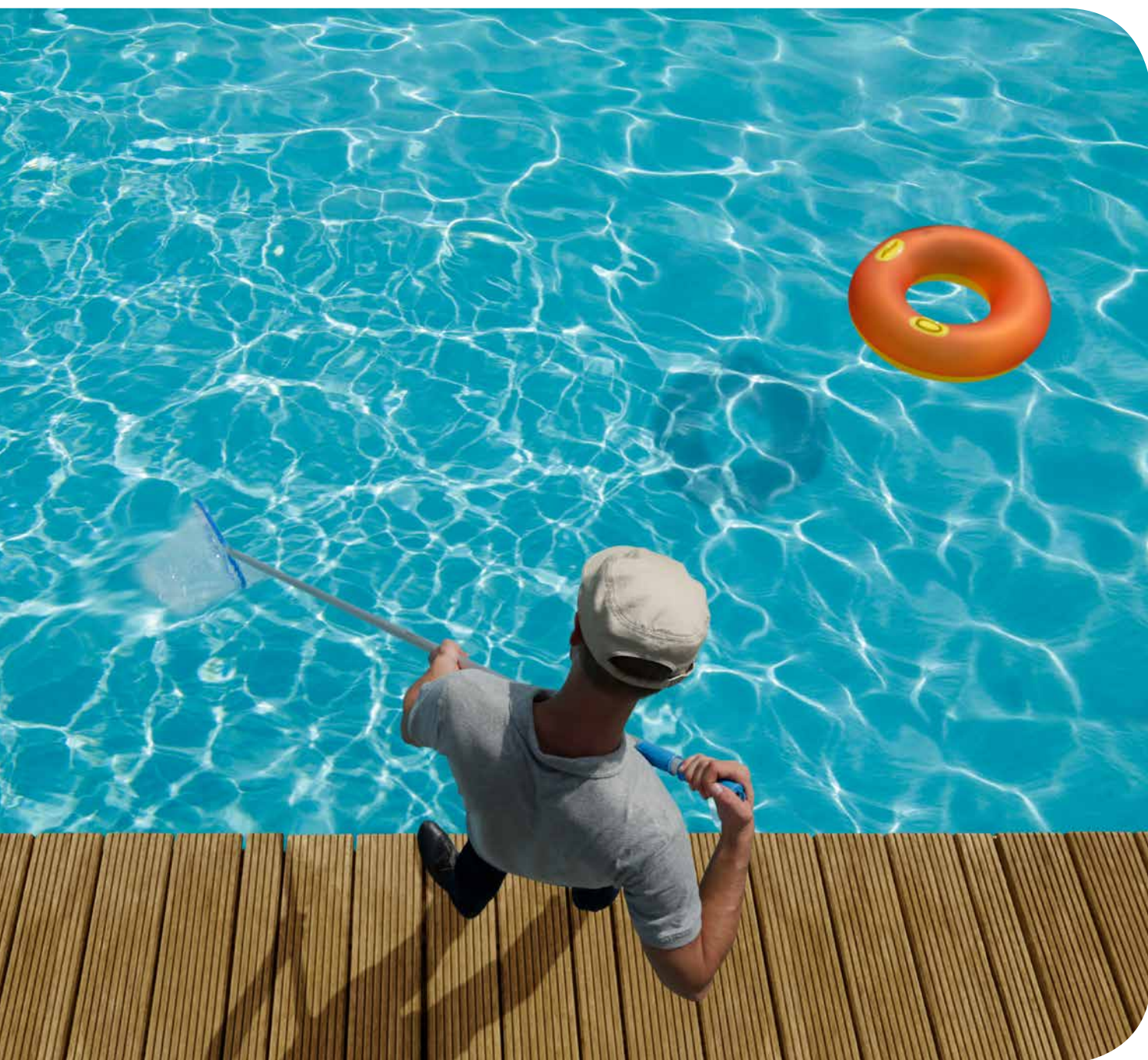
Scuba II
Page 170



PM Photometer
Page 172



Pooltester





Water Treatment

pH value

The pH value of pool & spa water should generally be between the slightly acidic value of 6.5 and the slightly basic value of 7.6. Due to the use of various water treatment chemicals as well as ambient environmental effects, pool owners have to determine the pH of the water and correct the value as necessary.

Disinfection

Nowadays, pool owners can choose from a range of modern water treatment agents that are often used in combination.

These water treatment chemicals are only effective within a limited pH range. Therefore in addition to checking the concentration of the water treatment chemicals, the owner / operator should also monitor the pH value of pool water and adjust it if necessary.



Rapid Tests

Three-Chamber Tester

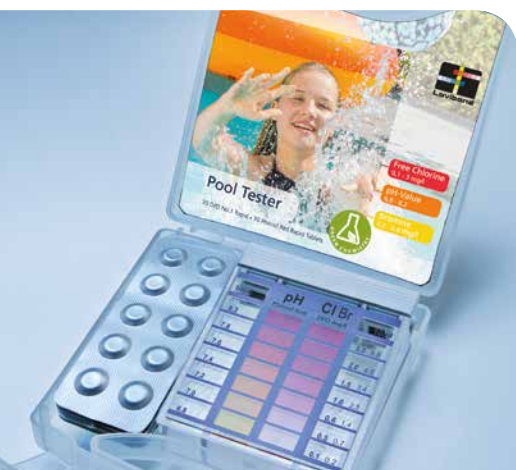
The Three-Chamber Tester is a competitively priced unit for the determination of disinfectants and the pH value. Interferences from the colour of the pool water are eliminated by the third, middle chamber.

Pooltester

The Pooltester is designed for the simultaneous determination of the most popular water treatment agents and the pH value.

Multipooltester

Additionally the Multipooltester allows the determination of cyanuric acid, total alkalinity and calcium hardness.



Compact Pool Test Kits

Item	Code
Chlorine-Bromine-pH LR, in mini case¹⁾	15 77 00
Bromine 0.2-6.8 mg/l Chlorine 0.1-3.0 mg/l / pH value 6.8-8.2	
Chlorine-Bromine-pH LR, in blister²⁾	15 75 20
Bromine 0.2-6.8 mg/l Chlorine 0.1-3.0 mg/l / pH value 6.8-8.2	
Chlorine-pH HR, in blister²⁾	15 80 10
Chlorine 0.5-6.0 mg/l / pH value 6.8-8.2	
Active Oxygen-pH, in blister²⁾	15 76 10
Active Oxygen 0-10 mg/l / pH value 6.8-8.2	
Biguanide (PHMB)-pH, in blister²⁾	15 61 50
Biguanide (PHMB) 10-100 mg/l pH-Wert 6.8-8.2	
4 in 1, in plastic case	15 17 00
Chlorine LR 0.1-3.0 mg/l / pH value 6.8-8.2 Cyanuric acid 20-200 mg/l Alkalinity-m 50-300 mg/l	
Phosphate Test Kit³⁾	15 78 00
0-1000 ppb (0-1mg/l PO ₄)	

¹⁾ Packaging unit 10 pcs.

²⁾ Packaging unit 6 pcs.

³⁾ Packaging unit 24 pcs.



Pooltester

Item	Code
Chlorine-pH LR⁴⁾	15 16 00
Chlorine 0.1-3.0 mg/l / pH value 6.8-8.2	
Chlorine-pH HR⁴⁾	15 16 01
Chlorine 0.5-6.0 mg/l / pH value 6.8-8.2	
Bromine-pH⁴⁾	15 16 04
Bromine 1.0-8.0 mg/l / pH value 6.8-8.2	
Active Oxygen-pH⁴⁾	15 16 05
O ₂ 0-10 mg/l / pH value 6.8-8.2	
Copper LR/HR-pH⁴⁾	15 51 90
Copper LR 0.1-1.0 mg/l & HR 0.5-5.0 mg/l pH value 6.8-8.2	
Active Oxygen-Copper-pH⁴⁾	15 52 35
O ₂ 0-10 mg/l / Copper 0.1-1.0 mg/l pH value 6.8-8.2	
Biguanide (PHMB)-Hydrogen Peroxide (H₂O₂)-pH⁴⁾	15 61 00
PHMB 10-100 mg/l / H ₂ O ₂ 5-50 mg/l pH value 6.8-8.2	

⁴⁾ Packaging unit 6 pc



Multi Pooltester

Item	Code
5 in 1 Multi-Pooltester⁵⁾	15 19 00
Chlorine 0.1-3.0 mg/l / pH value 6.8-8.2 Cyanuric acid 20-200 mg/l Alkalinity-m 20-800 mg/l Calcium hardness 20-800 mg/l	

⁵⁾ Packaging unit 5 pcs.



Delivery content

- Three-Chamber-Tester in a bubble pack or mini case
- Tablet reagents
- Instruction manual

Delivery content

- Pooltester in a sturdy plastic box
- Tablet reagents for 20 tests
- Instruction manual

Delivery content

- 5 in 1 Multi Pooltester
- Pooltester Chlorine - pH LR in a robust plastic case
- Cyanuric acid tube
- Dilution / shaker tube, 100 ml
- Dilution / shaker tube, 30 ml
- Cleaning brush
- Stirring rod
- 20 tablet reagents each DPD No. 1 Rapid, DPD No. 3 Rapid, Phenol Red Rapid
- 10 tablet reagents each CyA-Test, Alk-Test, CAL-Test
- Instruction manual
- Statements (phrases-H and P)

Refill Packs

Item	Code
Chlorine/Bromine/ pH*  30 DPD No.1 / RAPID-tablets and 30 PHENOL RED / RAPID-tablets	51 58 84
Active Oxygen - pH*  30 DPD No.4 / RAPID-tablets and 30 PHENOL RED / RAPID-tablets	51 59 34
Active Oxygen - Copper- pH* 20 DPD No.4 / RAPID-tablets 20 COPPER No.1-tablets and 20 PHENOL RED / RAPID-tablets	51 58 65
PHMB/H₂O₂- pH 20 PHMB-, 20 H ₂ O ₂ -, 20 ACIDIFYING PT- and 20 PHENOL RED / RAPID-tablets	51 58 70
PHMB - pH* 30 PHMB-tablets and 30 PHENOL RED / RAPID-tablets	51 61 55
Copper - pH*  30 COPPER No.1-tablets and 30 PHENOL RED / RAPID-tablets	51 57 78
Combi pack for Three-Chamber-Tester 4 in 1 20 DPD No.1/ RAPID-, 20 PHENOL RED / RAPID-, 20 CyA-TEST- 20 ALK LR-Tabletten	51 59 35
Combi pack for Multipooltester 5 in 1 20 DPD No.1/ RAPID-, 20 DPD No.3/ RAPID-, 20 PHENOL RED / RAPID-, 20 CyA-TEST- 10 ALK TEST- 10 CAL-TEST-tablets	51 59 80

* Each pack contains 12 units

Reagents

Item	Quantity	Code
Acidifying PT	100 pc. 250 pc.	51 54 90 51 54 91
ALK LR	100 pc.	51 60 40BT
ALK TEST	100 pc.	51 55 70BT
Bromthymolblue RAPID 	100 St. 250 St.	51 16 30BT 51 16 31BT
CAL TEST	100 pc.	51 55 80BT
Copper No.1 	100 pc. 250 pc.	51 35 50BT 51 35 51BT
Cyanuric Acid CyA-TEST 	100 pc. 250 pc.	51 13 70BT 51 13 71BT
DPD No.1 / RAPID 	100 pc. 250 pc. 500 pc.	51 13 10BT 51 13 11BT 51 13 12BT

Item	Quantity	Code
DPD No.3 / RAPID 	100 pc. 250 pc. 500 pc.	51 12 90BT 51 12 91BT 51 12 92BT
DPD No.4 / RAPID 	100 pc. 250 pc. 500 pc.	51 15 70BT 51 15 71BT 51 15 72BT
Hydrogenperoxide HR	100 pc. 250 pc.	51 59 40BT 51 59 41BT
PHENOL RED/RAPID (pH) 	100 pc. 250 pc. 500 pc.	51 17 90BT 51 17 91BT 51 17 92BT
PHMB (Biguanide)	100 pc. 250 pc.	51 58 90BT 51 58 91BT

 also suitable for seawater
 Green Chemistry



Lovibond®-RAPID tablets DPD and PHENOL RED will dissolve quickly, have a guaranteed 10 year shelf-life and are provided in green-printed foil packaging.

Material Safety Data Sheets:
www.lovibond.com





Scuba II

Electronic Pooltester



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

Scuba II

Every pool owner should check the most important parameters in the pool at regular intervals. This is the only way to ensure that water quality is maintained at the right level and to arrange dosing in an optimum manner.

The Scuba II enables the operator to check the pool water quickly and accurately. The integrated sample chamber is filled by immersing it in the water. A tablet reagent is added and generates a characteristic colour which can be measured using the photometric principle. The result is then displayed on the screen.

Six parameters, **free chlorine**, **total chlorine**, **pH**, **alkalinity**, **cyanuric acid** and **bromine** are measured within a few minutes. Water analysis becomes a pleasure rather than a chore and more time is left for enjoying the pleasure of the pool.

If the Scuba II falls into the water it will simply float and, of course, it is watertight.

Why not try this compact test equipment – after all, the knowledge that you are safe in a thoroughly hygienic pool is worth it.

Technical Data

Optics	temperature-compensated LED ($\lambda = 530 \text{ nm}$) and photo-sensor
Power supply	2 batteries (AAA), capacity approx. 90 tests
Auto-Off	automatic switch-off approx. 5 minutes after last key press
Display	LCD-display
Dimensions (L x W x H)	145 x 70 x 45 mm
Weight	approx. 165 g (incl. batteries)
Operating conditions	temperature: 5 – 40 °C relative humidity: 30 – 90 %, non-condensing
Approval	CE

Refill pack

Article	Code
Refill pack for Scuba II 	52 56 00
20 DPD No.1 Photometer tablets	
10 DPD No.3 Photometer tablets	
10 PHENOL RED Photometer tablets	
10 CyA-Test tablets	
10 Alka-M-Photometer tablets	
Packaging unit = 12 packs	

 Green Chemistry

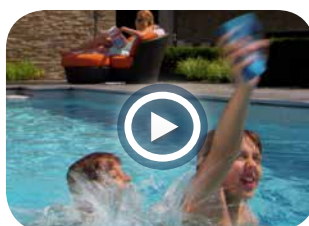
Determination	Range	Resolution	Accuracy
Chlorine, free	0.1 - 6 mg/l Cl_2	0.1 mg/l	0 - 1 mg/l $\pm 0.1 \text{ mg/l}$; 1 - 2 mg/l $\pm 0.2 \text{ mg/l}$ 2 - 3 mg/l $\pm 0.4 \text{ mg/l}$; 3 - 6 mg/l $\pm 0.5 \text{ mg/l}$
Chlorine, total	0.1 - 6 mg/l Cl_2	0.1 mg/l	0 - 1 mg/l $\pm 0.1 \text{ mg/l}$; 1 - 2 mg/l $\pm 0.2 \text{ mg/l}$ 2 - 3 mg/l $\pm 0.4 \text{ mg/l}$; 3 - 6 mg/l $\pm 0.5 \text{ mg/l}$
pH-value	6.5 - 8.4 pH	0.1 pH	$\pm 0.2 \text{ pH}$
Cyanuric acid	1 - 160 mg/l	1.0 mg/l	1 - 50 mg/l $\pm 10 \text{ mg/l}$; 50 - 160 mg/l $\pm 20 \text{ mg/l}$
Alkalinity (total)	0 - 300 mg/l CaCO_3	1.0 mg/l	$\pm 50 \text{ mg/l}$
Bromine	0.2 - 13.5 mg/l Br_2	0.1 mg/l	0 - 2 mg/l $\pm 0.2 \text{ mg/l}$ 2 - 4 mg/l $\pm 0.4 \text{ mg/l}$ 4 - 7 mg/l $\pm 0.8 \text{ mg/l}$ 7 - 13.5 mg/l $\pm 1.1 \text{ mg/l}$

Delivery content

- Scuba II in a robust plastic box
- Tablet reagents
20 DPD No.1 Phenol Red Photometer
10 DPD No.3
10 CyA-Test
10 Alka-M-Photometer
- 2 batteries (AAA)
- Stirring rod
- Instruction manual

Order code: 21 61 00-17 

Get
the
clip!



<http://scuba-II.lovibond.com>



PM Photometer

All pool parameters in one instrument



Bluetooth® 4.0
- Interface
(PM 630)

Back-lit display

Stores up to
1000 results

Intuitive operation

User guide in
German,
English,
French,
Spanish,
Italian,
Portuguese,
Polish
& Indonesian

The **Bluetooth®** word mark is a registered trademark owned by Bluetooth SIG, Inc. and any use by Lovibond® Tintometer GmbH is under license. **IOS®** is a registered trademark of Cisco, Inc. and licensed to Apple, Inc. **Android™** is a trademark of Google, Inc.

The Lovibond® PM 600 series of photometers has simplified the pool water analysis decisively. The PM 600 and PM 620 Photometers meet all requirements of demanding pool operators for a modern water analysis. The series is extended by the PM 630 with **Bluetooth®** data transmission.

The **PM 600** focusses on the main pool parameters required for balanced water including: Alkalinity, Bromine, Chlorine, Cyanuric Acid, Iron, Calcium Hardness, Copper, Sodium Hypochlorite, Ozone and pH-value.

The **PM 620** also has the following detection methods: Aluminium, Ammonia, Biguanides (PHMB), Chlorine dioxide, Total Hardness, Urea, Iodine, Phosphate, Acid capacity $KS_{4.3}$, Oxygen (active), Sulphate und Hydrogen peroxide.

The **PM 630** corresponds to the PM 620. It is additionally equipped with a **Bluetooth®** interface. This allows data to be transferred quickly and easily to a smartphone or tablet.

All instruments have a back-lit display. Operator guidance displays information about the measurement range and reagent type, as well as automatic countdown timers for accurate response times. The internal memory is capable of storing up to 1000 results with date, time and sample ID. These results can be retrieved and transmitted at any time.

Data transfer

PM 600 and **PM 620** can transfer data via an optional infrared module (IRIM) to the PC.

Code: 21 40 50

For the **PM 630**, a set of software and **Bluetooth®** dongle is available for data transfer to the PC.

Code: 24 44 480

Aqua LX® App

The system is further enhanced by the free Lovibond® App, **AquaLX®**, enabling the immediate review, process and evaluation of measured results directly on-site. Data trends can be monitored with easy-to-view graphical displays with set minimum and maximum values.



Display	Graphic-display
Interfaces	Infrared ¹ (PM 600 / PM 620), Bluetooth® 4.0 (PM 630), RJ45 socket for Internet updates ¹
Optics	LEDs, interference filters and photo sensor
Wavelength Accuracy	± 1 nm
Photometric Accuracy*	2 % FS (T = 20 °C – 25 °C)
Photometric Resolution	0.005 A
Operation	Acid and solvent resistant, touch-sensitive keypad with audible feedback via integrated beeper
Power Supply	4 batteries (Mignon AA/LR6)
Auto-Off	approx. 20 minutes after last keypress with audible signal
Dimensions	approx. 210 x 95 x 45 mm (unit) approx. 395 x 295 x 106 mm (case)
Weight (unit)	approx. 450 g
Ambient Conditions	5–40 °C at max. 30–90 % rel. humidity (non condensing)
Language Selection	German, English, French, Spanish, Italian, Portuguese, Polish, Indonesian
Memory Capacity	approx. 500 data sets (PM 630) approx. 1000 data sets (PM 600, PM 620)
Approval	CE

¹ optional available: connection cable with integrated electronics (RS 232 / RJ-45 plug)

* tested with standard solutions

Furthermore, additional personalized information, like sample takers or place of sampling can be added. Records can be transferred at the touch of a button by email either as a graphic or database record, simplifying the transfer, management and sharing of results.

PoolM8 App

AquaLX® complements the Langelier Index App, **PoolM8**, which negates the need for complex calculations for Balanced Water. By simply entering the results of the parameters (pH; Total Alkalinity; Calcium Hardness; Total Dissolved Solid; Temperature.), the App automatically determines and displays the results which can then be saved to create a history and, again, shared via email.



➔ **Reagents (Codes), from page 88**

The reference standards are used to check the photometric accuracy and reproducibility of the photometer's chlorine method.

An adjustment of the overall system from photometric meter and reagents is not possible with the reference standard kits. Consider using our ValidCheck Chlorine (see page 83).

The shelf life is two years from the date of manufacture when used and stored properly.

Reference Standard Kit Chlorine 21 56 30
0.2* and 1.0* mg/l
for tablet and VARIO methods ¹⁾

Reference Standard Kit Chlorine 21 56 35
0.5* and 2.0* mg/l
for tablet methods only

Reference Standard Kit Chlorine 21 56 36
1.0* and 4.0* mg/l
for tablet methods only

Reference Standard Kit pH 21 56 65
7.45* pH

* Approximate figure, actual figure specified in certificate of analysis enclosed

¹⁾ The standard values mentioned in kit 215630 for the VARIO method are for photometer PM 620 only, because this method is not available on the PM 600

Verification Standard Kit

The verification standards for the photometer PM 600/620/630 are used to check the photometric accuracy and reproducibility of all wavelengths in the instruments. The shelf life of the standards is two years from the date of manufacture when used and stored properly. The measurements are in units of mAbs.

Verification Standard Kit 21 56 80

Delivery Content

- Instrument in carrying case
- 4 batteries (AA)
- 3 round vials 24 mm ø
- Syringe, brush, stirring rod
- 1 plastic beaker 100 ml
- Reagents for
Chlorine (free, combined, total)
pH value
Calcium Hardness
Acid capacity $KS_{4.3}$ (Alkalinity-m)
- Instruction Manual
- Certificate of Compliance and Warranty information

PM 600 (13 Parameters, Infrared)
Order code: 21 40 60

PM 620 (34 Parameters, Infrared)
Order code: 21 40 65

PM 630 (34 Parameters, Bluetooth®)
Order code: 21 40 70

Green Chemistry

Bluetooth® is a wireless technology subject to regional approval. The use of the PM 630 with **Bluetooth®** is currently only permitted within Europe, the USA, Japan and in Canada. The use of the PM 630 will also be possible in other regions in the future. For current regions and further information, visit: bluetooth.lovibond.com
Regions in which the PM 630 with **Bluetooth®** can currently be used (status: 01/2019): within Europe (according R&TTE Directive 1999/5/EC); USA (according to FCC part 15, comprised in FCC ID QOQBLE113); Canada (comprised in IC 5123A-BGTBLE113), Japan (includes CAB ID 007-ABO 103)

Applications of Lovibond® Reagents

Parameter	Reagent	Application	
Acid capacity $KS_{4.3}$	ALKA-M-PHOTOMETER		 = Drinking water / Raw water
Acid concentration	ACID CONCENTRATION		 = Waste Water
Alkalinity-m	ALKA-M-PHOTOMETER		 = Seawater
Alkalinity-p	ALKA-P-PHOTOMETER		 (B) = Boiler- and Cooling water related
Aluminium	ALUMINIUM No. 1 ALUMINIUM No. 2		 (P) = Pool Water related
Aluminium	VARIO Aluminum ECR/F20 VARIO Aluminum Hexamine/F20 VARIO Aluminum Masking Reagent		RT = Reagent Test KT = Tube Test
Amine	Amine	 (B)	
Ammonia vario	VARIO Ammonia Salicylate F10 VARIO Ammonia Cyanurate F10		
Ammonia	AMMONIA No. 1 AMMONIA No. 2 Conditioning powder	  	
Ammonia LR	VARIO Ammonia Salicylate F5 VARIO Ammonia Cyanurate F5 VARIO Am Diluent Reagent LR		
Ammonia HR	VARIO Ammonia Salicylate F5 VARIO Ammonia Cyanurate F5 VARIO Am Diluent Reagent HR		
Arsenic (III, V)	Chemicals see manual		
Boron	BORON No. 1 BORON No. 2		
Bromine	DPD 1 Buffer solution DPD 1 Reagent solution		
Bromine	DPD No. 1 DPD No. 1 HIGH CALCIUM	 	
Cadmium (Cd^{2+})	Spectroquant® 1.14834.0001		
Chloride	CHLORIDE T1 CHLORIDE T2		
Chloride	RT (Chloride-51 / Chloride-52)		
Chlorine	DPD No. 1 RAPID DPD No. 3 RAPID DPD No. 4 RAPID		

Parameter	Reagent	Application	
Chlorine	DPD No. 1 DPD No. 3 DPD No. 1 HIGH CALCIUM		 = Drinking water / Raw water
Chlorine	DPD 1 Buffer solution DPD 1 Reagent solution DPD 3 Solution		 = Waste Water
Chlorine	VARIO Chlorine FREE-DPD/F10 VARIO Chlorine TOTAL-DPD/F10		 = Seawater
Chlorine HR (KI)	ACIDIFYING GP CHLORINE HR (KI)		 = Boiler- and Cooling water related
Chlorine dioxide	DPD No. 1 DPD No. 3 GLYCINE		 = Pool Water related
Chlorine dioxide	DPD 1 Buffer solution DPD 1 Reagent solution		RT = Reagent Test
Chromium	PERSULF. RGT FOR CR Chromium Hexavalent		KT = Tube Test
COD LR	Reaction tube 0-150 mg/l		
COD MR	Reaction tube 0-1500 mg/l		
COD HR	Reaction tube 0-15000 mg/l		
Colour (Spectral Absorption Coefficient)	---		
Copper	COPPER No. 1 COPPER No. 2		
Copper, free	VARIO Cu 1 F 10		
Cyanide	Reagent test set, consists of: Cyanide-11/ -12 / -13		
Cyanuric acid	CyA-TEST, CyA-HR TEST		
DEHA	DEHA Solution DEHA		
DEHA	VARIO OXYSCAV 1 Rgt VARIO DEHA 2 Rgt Solution		

Applications of Lovibond® Reagents

Parameter	Reagent	Application	
Fluoride	SPADNS-Reagent Fluoride Standard		 = Drinking water / Raw water
Fluoride	Fluoride A-Z Fluoride Excess Al		 = Waste Water
Formaldehyde	Spectroquant® 1.14678.0001		 = Seawater
Formaldehyde	Spectroquant® 1.14500.0001		 (B) = Boiler- and Cooling water related
Hardness, total	HARDCHECK P		 (P) = Pool Water related
Hardness, total	Hardness Yes/No		RT = Reagent Test
Hardness, total	T Hardness-Test		KT = Tube Test
Hardness, total	Total Hardness		
Hazen (Pt-Co-Scale; APHA)	---		
Hydrazine	Hydrazine Test Powder Spoon	 (B)	
Hydrazine	Vacu-vials® / Chemetrics K-5003	 (B)	
Hydrogen peroxide	HYDROGENPEROXIDE LR	 (P)	
Iodine	DPD No. 1		
Iron (II, III) soluble	Vario Ferro F10		
Iron (II, III) soluble	IRON LR IRON (II) LR		
Iron	IRON HR		
Iron (TPTZ)	Vario TPTZ F10		
Lead (Pb²⁺)	Spectroquant® 1.09717.0001		
Lead (Pb²⁺)	Spectroquant® 1.14833.0001		
Manganese	MANGANESE LR 1 MANGANESE LR 2		
Manganese	VARIO Ascorbic Acid VARIO Alkaline-Cyanide VARIO PAN Indicator		
Molybdate	MOLYBDATE No. 1 HR MOLYBDATE No. 2 HR		
Nickel	RT (Nickel-51, Nickel-52)		

Parameter	Reagent	Application
Nitrate	KT (Nitrate-111)	
Nitrate	VARIO Nitrate Chromotropic VARIO Nitra X Reagent tube VARIO Deionised water	
Nitrate	NITRITE LR Nitrate Test Tablets Nitrate Test Powder	
Nitrite	KT (Nitrit-101)	
Nitrite	NITRITE LR	
Nitrite	Nitrite No.1 Nitrite No.2	
Nitrogen-total	KT (Reagent for digestion, Reagent for compensation, Nitrat-111)	
Nitrogen, total LR	VARIO TN HYDROX. LR tubes VARIO PERSULFATE Reagent VARIO TN Reagent A VARIO TN Reagent B VARIO TN ACID LR/HR tubes VARIO Deionised water	
Nitrogen, total HR	VARIO TN HYDROX HR tubes VARIO PERSULFATE Reagent VARIO TN Reagent A VARIO TN Reagent B VARIO TN ACID LR/HR tubes VARIO Deionised water	
Oxygen, active	DPD No. 4	
Oxygen, active	INDIGO CARMINE	
Oxygen, dissolved	Vacu-vials® / Chemetrics K-7553	
Ozone	DPD No. 1 DPD No. 3 GLYCINE	
Ozone	Ozone	
Phenols	Phenole No. 1 Phenole No. 2	

 = Drinking water / Raw water

 = Waste Water

 = Seawater

 = Boiler- and Cooling water related

 = Pool Water related

RT = Reagent Test

KT = Tube Test

Applications of Lovibond® Reagents

Parameter	Reagent	Application	
PHMB (Biguanide)	PHMB PHOTOMETER		 = Drinking water / Raw water
Phosphate-Organo	ORGANO-PHOSPHONATE No.1 ORGANO-PHOSPHONATE No.2		 = Waste Water
Phosphate HR	PHOSPHATE HR		 = Seawater
Phosphate-total* (PMB)	KT (Phosphate-101, Phosphate-102, Phosphate-103)		 = Boiler- and Cooling water related
Phosphate-total* (PMB)	KT (Phosphate-101, Phosphate-102, Phosphate-103)		 = Pool Water related
Phosphate-ortho (VM)	KT		RT = Reagent Test
Phosphate LR, ortho	PHOSPHATE LR No. 1 PHOSPHATE LR No. 2		KT = Tube Test
Phosphate HR, ortho	PHOSPHATE HR No. 1 PHOSPHATE HR No. 2		
Phosphate, ortho	VARIO Phos 3 F10		
Phosphate, ortho	VARIO Dilution Vial VARIO Phos 3 F10 VARIO Deionised water		
Phosphate, total*	VARIO Acid Reagent Vial VARIO Phos 3 F10 VARIO Potassium Persulfate VARIO Sodium hydroxide 1,54 N VARIO Deionised water		
Phosphate, acid hydrolyzable	Content see: Phosphate, total, set, additional: VARIO Sodium hydroxide 1,00 N		
pH value	BROMOCRESOLPURPLE/PHOTOM.		
pH value	PHENOLRED RAPID		
pH value	PHENOLRED / PHOTOMETER		
pH value	PHENOLRED Solution		
pH value	THYMOLBLUE/PHOTOMETER		
pH value	BROMTHYMOLBLUE		
pH value	METHYL RED		
pH value	CRESOL RED		
pH value	BROMOPHENOL BLUE		
pH value	BROMOCRESOL GREEN		
pH value	M-CRESOLPURPLE		

*total phosphorus determination contained is not possible unchanged in sea water

Parameter	Reagent	Application
pH value	UNIVERSAL PH	
Potassium	POTASSIUM T	
QAC	QAC Test	
QAC LR	QAC LR	
QAC HR	QAC HR	
Silica	SILICA No. 1 SILICA No.2 SILICA PR	
Silica	VARIO LR Amino Acid F F10 VARIO Citric Acid F10 VARIO Molybdate 3 Rgt Solution	
Silica	VARIO Silica HR Acid Rgt F10 VARIO Silica Citric Acid F10 VARIO Silica Molybdate F10	
Sulphate	SULFATE T	
Sulphate	VARIO Sulpha 4 / F10	
Sulphate	SULFATE No.1 SULFATE No.2	
Sulphide	SULFIDE No. 1 SULFIDE No. 2	
Sulphite	SULFITE LR	
Sulphite	SULFITE No.1 SULFITE No.2 HR SULFITE No.2 LR	
Surfactants (anionic)	Spectroquant® 1.14697.0001	
Tannin	TANNIN No.1 TANNIN No.2	
TOC	Spectroquant® 1.14879.0001	
Turbidity	---	
Urea	UREA-Reagent 1 UREA-Reagent 2 AMMONIA No. 1 AMMONIA No. 2	
Zinc	COPPER / ZINC LR EDTA DECHLOR	

 = Drinking water / Raw water

 = Waste Water

 = Seawater

 = Boiler- and Cooling water related

 = Pool Water related

RT = Reagent Test

KT = Tube Test

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