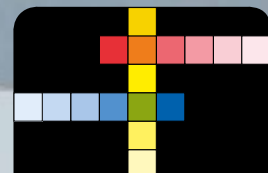


Photometry



Lovibond®

since 1885



Distributed By:

Camlab Limited

Camlab House, Norman Way Industrial Estate, Over, Cambridge CB24 5WE, UK

E: sales@camlab.co.uk

T: +44 1954 233110



Choice, Service, Trust
camlab



MD 100 / 110 / 200
Page 56 - 63



COD Setups
Page 64



MD 600 / 610
Page 66



MD 640
Page 70



SpectroDirect
Page 76



XD 7000 / 7500
Page 78



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.

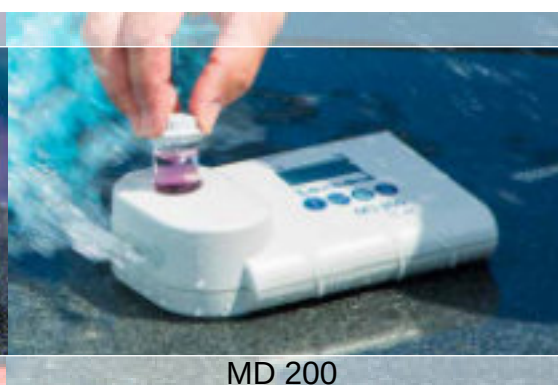
The **MultiDirect** offers a wide variety of pre-programmed methods and is therefore suitable for the demands of modern water and drinking water analysis.

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).

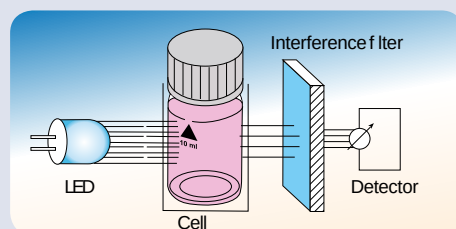


* HACH® is a registered trademark of Hach Company, Loveland, Colorado. The use of the HACH® trademark does not imply any affiliation with or approval by Hach Company regarding the formulation, testing or compatibility of these products for use in HACH® brand spectrophotometers or other instruments or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

* 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.



Photometer MD 100, MD 110 & MD 200



- Bluetooth® Interface (MD 110)
- One Time Zero, saves time
- Illuminated display
- Waterproof*

Measurements using high quality interference filters with long-life LED 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 to R&TTE Directive 1999/5/EC); USA (according to FCC part 15, comprised in FCC ID QOQBT113); Canada (comprised in IC 5123A-BG TBLE113), Japan (includes CABID 007-AB0103)

*available in 2019

Scroll Memory (SM)

To avoid unnecessary scrolling for the required test method, the instrument memorizes the last method used before switching of 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 standard traceable to N.I.S.T. adjust.

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



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 wavelengths 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)

Data Transfer

The optional available IRI (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 IRI.

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.



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

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



Primary standard chlorine

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



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

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

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.



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 FeTPTZ	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	-	-	
Hardnesstotal		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 appliesto all methods of the measuring instrument)

** Deliverywithout reagents



Please see pages 88 onwards for reagents (order codes)

Single-Parameter MD 100 / MD 110 / MD 200

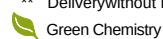
Single-Parameter	Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents			
	Phosphate		0,05 - 4,0 mg/l PO ₄	M320 / PO ₄	Tablet	✓	276040	-	-
			0,06 - 2,5 mg/l PO ₄	M323 / PO ₄	Powder	✓	276045	-	-
	Silica		0,05 - 4,0 mg/l SiO ₂	M350 / Si	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				
	pH								
	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				

3in1	Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents			
	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	-	-
			0,02 - 4 mg/l Cl ₂	M101 / CL6					
	Chlorine HR (KI)		5 - 200 mg/l Cl ₂	M105 / CLHr	Tablet				
	Chlorine dioxide		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								
	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 applied 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	Tabletsfor Chlorine, pH, CyA, Alka-M	278070	2980702	2860502	
		0,02 - 4 mg/l Cl ₂	M101 / CL6	Liquid	Tabletsfor 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, Tabletsfor 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	Tabletsfor Chlorine, pH, CyA and Acid Capacity	-	-	2860512	
		0,02 - 4 mg/l Cl ₂	M101 / CL6	Liquid	Tabletsfor 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	Tabletsfor 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						
pH									
Acid Capacity									
Urea									
Chlorine	✓	0,01 - 6,0 mg/l Cl ₂	M100 / CL6	Tablet or	Tabletsfor 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					
		0,02 - 11 mg/l ClO ₂	M120 / CLO2	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					
Chlorine dioxide									
pH									
Acid Capacity									

* OTZ(zero adjustment appliesto all methods of the measuringinstrument)
** Deliverywithout 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 appliesto 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+/β+}	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+/β+}	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 (MD 110 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 Δλ = 5 nm 530 nm Δλ = 5 nm 560 nm Δλ = 5 nm 580 nm Δλ = 5 nm 610 nm Δλ = 6 nm 660 nm Δλ = 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 RD125

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 RD125. 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 RD125 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 RD125
- 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 LR0,01 - 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 VARIOHR tube test	53 56 50
Nitrate VARIO tube test	53 55 80
Nitrite LRVARIO powder pack	53 09 80
Nitrogen VARIO Total HR tube test	53 55 60

ValidCheckWW 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	

ValidCheckWW 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 Height 48 mm, Ø 24 mm	19 76 29
Membrane filter set for use when preparing samples, 25 membrane filters 0.45 µm, 2 syringes 20 ml	36 61 50
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
Automatic pipette ²⁾ , 1 - 5 ml	41 90 76
Pipette tips ²⁾ , 1 - 5 ml (white), 100 pc.	41 90 66
Automatic pipette ³⁾ , 0.1 - 1 ml	41 90 77
Pipette tips ³⁾ , 0.1 - 1 ml (white), 1000 pc.	41 90 73

¹⁾ without chloride removal

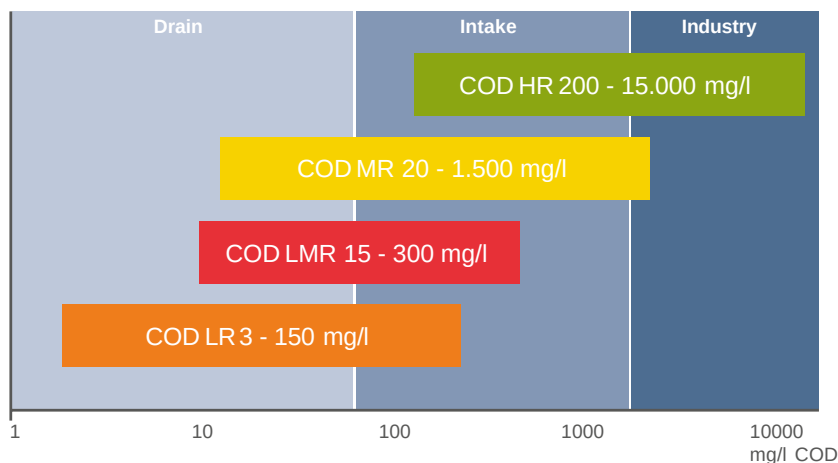
²⁾ LR, LMR, HR

³⁾ HR

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.

further information on page 83

The right CODtube 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

CODdetermination

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 LED 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 Instrument in carrying case	Code: 27 61 30
COD Setup MD 110 Instrument in carrying case	Code: 29 61 302
COD Setup MD 200 Instrument in carrying case	Code: 289 26 02
COD Setup MD 600 Instrument in carrying case	Code: 21 40 40
COD Setup MD 610 Instrument in carrying case	Code: 21 40 41

COD VARIO Tube tests

The Lovibond® COD VARIOtube 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	Order code
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 (25 pc.) new!	2 42 31 20
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*

Photometers MD 600 & MD 610



 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 standard 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 to R&TTE Directive 1999/5/EC); USA (according to FCC part 15, comprised in FCC ID QOQBT113); Canada (comprised in IC 5123A-BG TBLE113); 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-Of	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 (RS232 / RJ-45 plug)

* tested with standard solutions

 Please see pages 88 onwards for reagents (order codes)

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.

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 IRiM	21 40 50
Bluetooth Dongle Set incl. PC Software	24 44 480

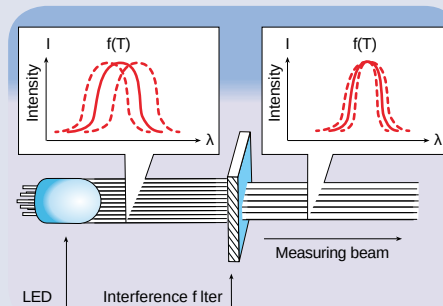
Verification Standard Kit

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 wavelengths 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 occurring 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.

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 to R&TTE Directive 1999/5/EC); USA (according to FCC part 15, comprised in FCC ID Q00BT113); Canada (comprised in IC 5123A-BG TBLE113), Japan (includes CABID 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



*All photometric
methods of the
MD 600*

- Interface

*Fluometric
measurement
of PTSA &
Fluorescein*

*no adapter for
Fluorescence
necessary*

Photometry, trace analysis and tracer detection in one instrument

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 to 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-Of	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, 50 ml	46 12 10
PTSA calibration set (0, 200, 1000 ppb)	46 12 45
Fluorescein standard addition solution, 400 ppb, 50 ml	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 (RS232 / 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 (VARIOPowder Packs). Users can also store their own methods.

The MultiDirect has 6 precision interference filters using different wavelengths.

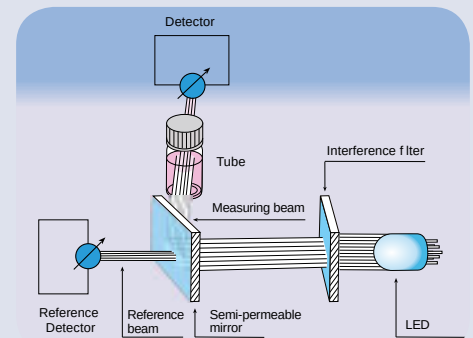
The unique design of the optics allows the automatic selection of the required wavelength without any moving parts. This and the dual beam technology utilizing an internal reference channel, guarantees the highest accuracy.

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, $\lambda_1 = 430 \text{ nm IFA } \lambda (\text{nm}) = 5$, $\lambda_2 = 530 \text{ nm IFA } \lambda (\text{nm}) = 5$, $\lambda_3 = 560 \text{ nm IFA } \lambda (\text{nm}) = 5$, $\lambda_4 = 580 \text{ nm IFA } \lambda (\text{nm}) = 5$, $\lambda_5 = 610 \text{ nm IFA } \lambda (\text{nm}) = 6$, $\lambda_6 = 660 \text{ nm IFA } \lambda (\text{nm}) = 5$ 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-Of	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
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 10 94
Lid for adapter	19 80 11 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
Sealing ring for vial Ø 24 mm (12 pc.)	19 76 26
Cleaning cloth for vials	19 76 35
Adapter for Vacu-vial®	19 20 75
Plastic beaker, 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 pc.)	36 41 20
Plastic stirring rod, 10 cm length	36 41 09
Plastic stirring rod, 10 cm length, (10 pc.)	36 41 30

Item	Code
Cleaning brush, 10 cm	38 02 30
Syringe, plastic, 2 ml	36 90 80
Syringe, plastic, 5 ml	36 61 20
Syringe, plastic, 10 ml	36 90 90
Rubber seal cap	19 80 15 01
Mains charger, 100-240 V, 50-60 Hz, with international adapters	19 30 10
Cable for connection to PC, serial 9-pins	19 81 98
AA Ni-MH, 1100 mAh (7 pc.)	19 50 02 0
Lithium battery	19 50 01 7
Verification Standard Kit	21 56 50
Plain paper printer Incl. mains adapter and RS232 cable	198077

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 wavelengths 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 RS232 cable	19 80 77



Photometry

Delivery Content

SpectroDirect (standard equipment)

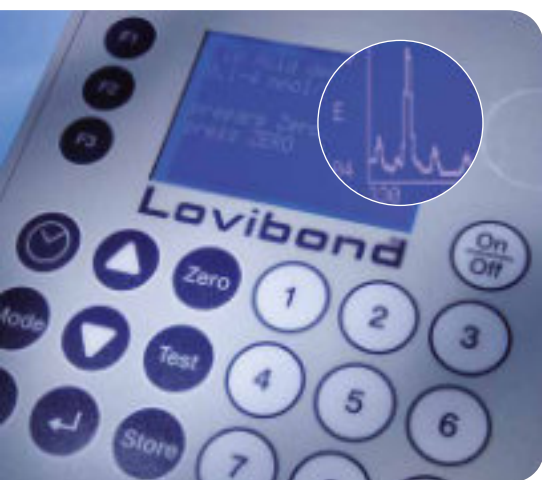
- SpectroDirect (basic unit)
 - Power supply unit 100 - 240 V
 - Serial cable for connection to a PC
 - Magnetic pin (for Update)
 - 2 batteries (AA)
 - Manufacturer's test certificate M
 - Warranty information
 - Instruction manual
- Order code: 71 20 00

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
 - Manufacturer's 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 of ered.

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.

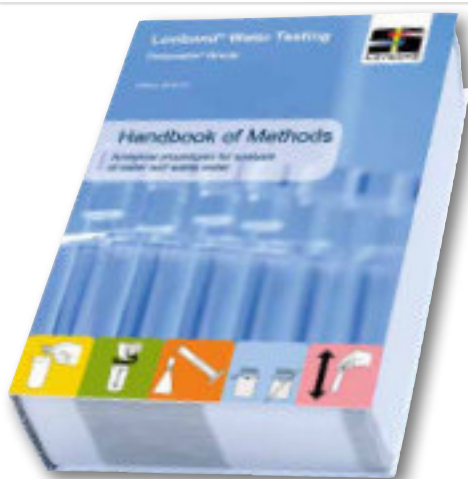
Spectrophotometer XD 7000
Order Code: 71307000

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 1 x 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

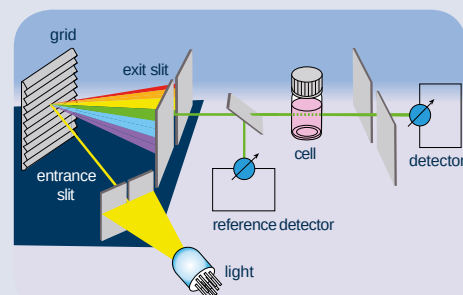
The 900 pages contain more than 160 Lovibond® test methods. Each method can also be selected directly by the XD instrument via barcode with the scanner. With basic chapters on water analysis, source and literature references, references to standards and explanations for possible errors, it is also a 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 DAKK calibration	711160
Secondary standard set VIS with UV mit DAKK 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 Kıtıbi, 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 fashes, 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 respectively required wavelength is precisely demarcated and allows a wavelength 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 ⁻	10 mg/l NO ₃ ⁻
ValidCheck Nitrate	NO ₃ ⁻	50 mg/l NO ₃ ⁻
ValidCheck Nitrite	NO ₂ ⁻ -N	0,1 mg/l
ValidCheck Nitrite	NO 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 ⁻ 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 ³⁻ -P/TP	CSB/COD/ TOC NO 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 ³⁻ -P/TP	CSB/COD/ TOC NO 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 stocking 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

