

# MD 100 Photometer

Precise Water Analysis  
in High-Quality Design



## Small | Mobile | Rapid

The MD 100 uses high quality interference filters with long-life LEDs as a light source without any moving parts in a transparent sample chamber.

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

The calibration and software-based adjustment options mean that the MD 100 is also suitable for use as a testing instrument.

The tests are conducted using either Lovibond® tablet reagents with long-term stability and a guaranteed minimum 5 or 10 year shelf life, VARIO powder reagents or using liquid reagents.

➔ Please see pages 78 onwards for reagents (order codes)

## Highlights

- Scroll memory
- Automatic switch-off
- Real-Time-Clock and date
- Calibration mode
- Backlit display
- Storage function
- One Time Zero (OTZ)
- Waterproof\*)

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

## Single-Parameter

Test	Code
<b>MD 100 Aluminium</b> , tablet reagents 0.01 - 0.3 mg/l Al	27 62 00
<b>MD 100 Aluminium</b> , powder reagents 0.01 - 0.25 mg/l Al	27 62 05
<b>MD 100 Ammonia</b> , tablet reagents 0.02 - 1.0 mg/l N	27 60 60
<b>MD 100 Ammonium</b> , powder reagents 0.01 - 0.8 mg/l N	27 60 65
<b>MD 100 Chloride</b> , tablet reagents 0.5 - 25 mg/l Cl <sup>-</sup> 5 - 250 mg/l Cl <sup>-</sup> (by dilution)	27 61 80
<b>MD 100 Chlorine</b> , tablet reagents (OTZ) 0.01 - 6.0 mg/l Cl <sub>2</sub> / 0.1 - 10 mg/l Cl <sub>2</sub> *	27 60 00
<b>MD 100 Chlorine</b> , liquid reagent (OTZ) 0.02 - 4 mg/l Cl <sub>2</sub>	27 60 05
<b>MD 100 Chlorine DUO</b> , for 2 types of reagents 1) Tablet reagents 0.01 - 6.0 mg/l Cl <sub>2</sub> / 0.1 - 10 mg/l Cl <sub>2</sub> * 2) Powder reagents 0.02 - 2.0 mg/l Cl <sub>2</sub> (ø 24 mm glass vial) 0.1 - 8.0 mg/l Cl <sub>2</sub> (ø 10 mm <b>multi vial-2</b> )	27 60 20 27 60 25
<b>MD 100 Chlorine</b> , powder reagents 0.02 - 2.0 mg/l Cl <sub>2</sub> (ø 24 mm glass vial) 0.1 - 8.0 mg/l Cl <sub>2</sub> (ø 10 mm <b>multi vial-2</b> )	27 60 10
<b>MD 100 Chlorine HR (Potassium iodide)</b> , tablet reagents 5 - 200 mg/l Cl <sub>2</sub> (ø 16 mm round vial & adapter)	27 61 70
<b>MD 100 Chlorine dioxide</b> , tablet reagents 0.02 - 11 mg/l ClO <sub>2</sub>	27 60 30
<b>MD 100 Chlorine dioxide</b> , powder reagents 0.04 - 3.8 mg/l ClO <sub>2</sub>	27 60 35
<b>MD 100 COD</b> , tube tests, without reagents 27 61 20 0 - 150 mg/l O <sub>2</sub> (ø 16 mm) 0 - 1500 mg/l O <sub>2</sub> (ø 16 mm) 0 - 15000 mg/l O <sub>2</sub> (ø 16 mm)	
<b>MD 100 Copper</b> , tablet reagents 0.05 - 5.0 mg/l Cu	27 60 80
<b>MD 100 Copper</b> , powder reagents 0.05 - 5.0 mg/l Cu	27 60 85
<b>MD 100 Hardness, total</b> , tablet reagents 2 - 50 mg/l CaCO <sub>3</sub> 20 - 500 mg/l CaCO <sub>3</sub> (by dilution)	27 61 90
<b>MD 100 Hazen</b> , no reagents required 0 - 500 mg/l Pt-Co	27 61 60
<b>MD 100 Iron</b> , tablet reagents 0.02 - 1.0 mg/l Fe	27 60 50
<b>MD 100 Iron TPTZ</b> , powder reagents 0.02 - 1.8 mg/l Fe	27 60 55
<b>MD 100 Iron</b> , powder reagents 0.02 - 3.0 mg/l Fe	27 60 56
<b>MD 100 Fluoride</b> , without reagents 0.05 - 2.0 mg/l F <sup>-</sup>	27 60 90
<b>MD 100 Manganese LR</b> , tablet reagents 0.2 - 4.0 mg/l Mn	27 61 00
<b>MD 100 Manganese LR</b> , powder reagents 0.01 - 0.7 mg/l Mn	27 61 05
<b>MD 100 Manganese HR</b> , powder reagents 0.1 - 18 mg/l Mn	27 61 06

## Single-Parameter

Test	Code
<b>MD 100 Molybdenum LR</b> Powder reagents / reagent solution 0.03 - 3.0 mg/l Mo (mixing cylinder required, not included)	27 61 40
<b>MD 100 Molybdenum HR</b> , powder reagents 0.3 - 40 mg/l Mo	27 61 41
<b>MD 100 Molybdenum</b> , tablet reagents 0.6 - 30 mg/l Mo	27 61 42
<b>MD 100 Phosphate</b> , tablet reagents 0.05 - 4.0 mg/l PO <sub>4</sub>	27 60 40
<b>MD 100 Phosphate</b> , powder reagents 0.06 - 2.5 mg/l PO <sub>4</sub>	27 60 45
<b>MD 100 Silica</b> , tablet reagents 0.05 - 4.0 mg/l SiO <sub>2</sub>	27 61 10
<b>MD 100 Silica LR</b> , powder reagents 0.1 - 1.6 mg/l SiO <sub>2</sub>	27 61 15
<b>MD 100 Silica HR</b> , powder reagents 1 - 90 mg/l SiO <sub>2</sub>	27 61 16
<b>MD 100 Suspended solids</b> no reagents required 0 - 750 mg/l TSS	27 61 50
<b>MD 100 Urea</b> , tablet reagents 0.1 - 2.5 mg/l Urea 0.2 - 5 mg/l Urea (by dilution)	27 62 10

## 2in1

<b>MD 100 Chlorine, pH</b> , tablet reagents (OTZ) 0.01 - 6.0 mg/l Cl <sub>2</sub> / 0.1 - 10 mg/l Cl <sub>2</sub> * 6.5 - 8.4 pH	27 80 20
<b>MD 100 Chlorine, pH</b> , liquid reagent (OTZ) 0.02 - 4 mg/l Cl <sub>2</sub> / 6.5 - 8.4 pH	27 80 25
<b>MD 100 Chlorine, pH</b> , powder reagents for chlorine 0.02 - 2.0 mg/l Cl <sub>2</sub> (ø 24 mm glass vial) 0.1 - 8.0 mg/l Cl <sub>2</sub> (ø 10 mm <b>multi vial-2</b> ) 6.5 - 8.4 pH	27 80 30

## 3in1

<b>MD 100 Chlorine, pH, Cyanuric acid</b> tablet reagents (OTZ) 0.01 - 6.0 mg/l Cl <sub>2</sub> / 0.1 - 10 mg/l Cl <sub>2</sub> * 6.5 - 8.4 pH ; 0 - 160 mg/l cyanuric acid	27 80 10
<b>MD 100 Chlorine, pH, Cyanuric acid</b> , liquid reagent for chlorine and pH (OTZ) 0.02 - 4 mg/l Cl <sub>2</sub> / 6.5 - 8.4 pH 0 - 160 mg/l cyanuric acid	27 80 15
<b>MD 100 Chlorine, pH, Alkalinity-M</b> tablet reagents (OTZ) 0.01 - 6.0 mg/l Cl <sub>2</sub> / 0.1 - 10 mg/l Cl <sub>2</sub> * 6.5 - 8.4 pH ; 5 - 200 mg/l CaCO <sub>3</sub> (TA)	27 80 60
<b>Chlorine, pH, Alkalinity-M (total)</b> liquid reagent for chlorine and pH (OTZ) 0.02 - 4 mg/l Cl <sub>2</sub> / 6.5 - 8.4 pH 5 - 200 mg/l CaCO <sub>3</sub> (TA)	27 80 65
<b>Chlorine LR, Chlorine HR, Chlorine dioxide</b> <sup>#</sup> , tablet reagents 0.01 - 6.0 mg/l Cl <sub>2</sub> 5 - 200 mg/l Cl <sub>2</sub> (ø 16 mm round vial) 0.02 - 11 mg/l ClO <sub>2</sub>	27 80 00

## 4in1

Test	Code
<b>MD 100 Chlorine, pH, Cyanuric acid, Alkalinity-M</b> , tablet reagents (OTZ) 0.02 - 6.0 mg/l Cl <sub>2</sub> / 0.1 - 10 mg/l Cl <sub>2</sub> * 6.5 - 8.4 pH ; 0 - 160 mg/l cyanuric acid 5 - 200 mg/l CaCO <sub>3</sub> (TA)	27 80 70
<b>MD 100 Chlorine, pH, Cyanuric acid, Alkalinity-M (total)</b> liquid reagent for chlorine and pH (OTZ) 0.02 - 4 mg/l Cl <sub>2</sub> / 6.5 - 8.4 pH 0 - 160 mg/l cyanuric acid / 5 - 200 mg/l CaCO <sub>3</sub> (TA)	

## 5in1

<b>MD 100 Chlorine, pH, Cyanuric acid, Alkalinity-M, Calcium hardness</b> tablet reagents (OTZ) 0.02 - 6.0 mg/l Cl <sub>2</sub> / 0.1 - 10 mg/l Cl <sub>2</sub> * 6.5 - 8.4 pH ; 0 - 160 mg/l cyanuric acid 5 - 200 mg/l CaCO <sub>3</sub> (TA) ; 0 - 500 mg/l CaCO <sub>3</sub> (CaH)	27 80 80
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## 6in1

<b>MD 100 Chlorine, Bromine, pH, Cyanuric acid, Alkalinity-M, Calcium hardness</b> , tablet reagents (OTZ) 0.02 - 6.0 mg/l Cl <sub>2</sub> / 0.1 - 10 mg/l Cl <sub>2</sub> * 0.05 - 13 mg/l Br ; 6.5 - 8.4 pH 0 - 160 mg/l cyanuric acid ; 5 - 200 mg/l CaCO <sub>3</sub> (TA) 0 - 500 mg/l CaCO <sub>3</sub> (CaH)	27 80 90
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## MD 100 Boiler Water

<b>MD 100 Aluminium, Chloride, Copper, DEHA, Hydrazine, Iron, Oxygen (dissolved), Phosphate, Polyacrylate, Silica</b> (delivery without reagents)	27 62 30
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## MD 100 Cooling Water

<b>MD 100 Aluminium, Bromine, Chlorine, Chlorine HR, Chlorine dioxide, Copper, Iron, Iron in Mo, Molybdate LR, Molybdate HR, Ozone, Polyacrylate, Sulphate, Triazoles, Zinc</b> (delivery without reagents)	27 62 40
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\* Delivery without reagents for measuring range 0.1 - 10 mg/l Cl<sub>2</sub>

# Where chlorine and chlorine dioxide are present together, they may be determined quantitatively as a single figure.

# MD 100 Photometer



## 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.

## Delivery Content

- Instrument in carrying case
- 4 micro batteries (AAA)
- 3 Round vials (glass) with lid
- 1 stirring rod & 1 brush
- Tablet reagents and/or liquid reagents or VARIO Powder reagent
- Warranty information
- Certificate (COC)
- Instruction Manual

## 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 device is turned off. (**O**ne **T**ime **Z**ero - OTZ). The zero setting can be confirmed whenever it is required.

## Manufacturers Test Certificate M

Besides the "Certificate of Compliance" which is supplied with the MD 100, manufacturers test certificates M are 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 has a factory calibration, which is related to international standards which are not N.I.S.T traceable. The instrument may be calibrated by the user in a "user calibration mode" with N.I.S.T traceable standards.

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

## Technical Data

<b>Optics</b>	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
<b>Wavelength Accuracy</b>	$\pm 1$ nm
<b>Photometric Accuracy<sup>4)</sup></b>	3 % FS (T = 20 °C – 25 °C)
<b>Photometric Resolution</b>	0.01 A
<b>Power Supply</b>	4 micro batteries (AAA), capacity approx. 17 hours or 5000 tests
<b>Auto - OFF</b>	automatic switch-off
<b>Display</b>	backlit LCD (on keypress)
<b>Storage</b>	internal ring memory for 16 data sets
<b>Interfaces</b>	infrared interface for test data transfer
<b>Additional feature</b>	real time clock and date
<b>Calibration</b>	factory calibration and user calibration. Reset to factory calibration possible
<b>Dimensions</b>	155 x 75 x 35 mm (L x W x H)
<b>Weight</b>	basic unit approx. 260 g
<b>Environmental conditions</b>	temperature: 5 – 40 °C rel. humidity: 30 – 90 % (non condensing)
<b>CE-Conformity</b>	

<sup>4)</sup> tested with standard solutions



## 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
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
Set of 12 plastic vials (PC), with lid "Multi"-Type 2, Ø 10 mm	19 76 00
Vial stand for 6 round vials Ø 24 mm, acrylic glass	41 89 51
Vial stand for 10 vials (Ø 16 mm or □ 13,5 mm), acrylic glass	41 89 57
Mixing cylinder, 25 ml, with stopper required accessory for molybdenum LR test 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)	19 50 026
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 pc.)	36 41 20
Plastic stirring rod, 10 cm length	36 41 09
Plastic stirring rod, 10 cm length, (10 pc.)	36 41 30
Infrared data transfer module IRiM	21 40 50



 Please see pages 78 onwards for reagents (order codes)



## Data transfer

The optional available IRiM (infrared interface module) uses modern infrared technology to transmit measurement data from the MD 100 photometer to one of 3 optional interfaces. These interfaces can be used to connect to a PC, a USB printer<sup>1)</sup> or alternatively a serial printer<sup>2)</sup>.

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 specified<sup>1)</sup> USB or alternatively a printer with a serial plug-in connected to the IRiM.

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

<sup>1)</sup> USB printer: HP Deskjet 6940 ; <sup>2)</sup> each ASCII printer  
Windows® is a registered Trademark of Microsoft Corporation

## Verification Standard Kit

The verification standard kit for the MD 100 is designed to assure the user of the accuracy and the reliability of the results related to the integrated wave lengths.

The kit contains one zero standard, 6 different vials for checking 6 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.

**Verification Standard Kit** 21 56 70

## Reference Standard Kit for MD 100

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 with tablet / liquid reagent 0.2\* and 1.0\* mg/l 27 56 50

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

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

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

**Kit pH** for instruments with tablet / liquid reagent 7,45\* pH 27 56 70

\* Approximate figure, actual figure specified in Certificate of Analysis



# MD 110 Photometer

Photometer with **Bluetooth®** Technology



## Highlights

- Scroll Memory
- Automatic switch-off
- Real-Time- Clock and date
- Calibration mode indicator
- backlit display
- Storage function
- One Time Zero (OTZ)
- **Bluetooth®**- Interface
- Waterproof\*)

\*) as defined in IP 68, 1 hour at 0,1 meter

## Delivery Content

- Instrument in carrying case
- 4 micro batteries (AAA)
- 3 round vials (glass) with lids
- 1 stirring rod & 1 brush
- Tablet reagents and/or liquid reagents or VARIO Powder reagent
- Warranty information
- Certificate (Certificate of Compliance)
- Instruction Manual

## Technical Data

<b>Optics</b>	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
<b>Wavelength Accuracy</b>	$\pm 1$ nm
<b>Photometric Accuracy<sup>4)</sup></b>	3 % FS (T = 20 °C – 25 °C)
<b>Photometric</b>	0.01 A
<b>Resolution</b>	
<b>Power Supply</b>	4 micro batteries (AAA), capacity approx. 17 hours or approx. 5000 tests In continuous operation with the display lighting switched off

<b>Auto - OFF</b>	automatic switch-off
<b>Display</b>	backlit LCD (on keypress)
<b>Storage</b>	internal ring memory for 125 data sets
<b>Interface</b>	<b>Bluetooth®</b> interface for test data transfer
<b>Additional feature</b>	real time clock and date
<b>Calibration</b>	factory calibration and user calibration. Reset to factory calibration possible
<b>Dimensions</b>	155 x 75 x 35 mm (L x W x H)
<b>Weight</b>	basic unit approx. 260 g
<b>Environmental conditions</b>	temperature: 5 – 40 °C rel. humidity: 30 – 90 % (non condensing)
<b>Approval</b>	CE

<sup>4)</sup> tested with standard solutions

## Single-Parameter

<b>MD 110 COD</b> , tube tests, without reagents	29 61 202
0 - 150 mg/l O <sub>2</sub> (ø 16 mm)	
0 - 1500 mg/l O <sub>2</sub> (ø 16 mm)	
0 - 15000 mg/l O <sub>2</sub> (ø 16 mm)	

## MD 110 Boiler Water

<b>MD 110 Aluminium, Chloride, Copper, DEHA, Hydrazine, Iron, Oxygen (dissolved), Phosphate, Polyacrylate, Silica</b> (delivery without reagents)	29 62 302
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## MD 110 Cooling Water

<b>MD 110 Aluminium, Bromine, Chlorine, Chlorine HR, Chlorine dioxide, Copper, Iron, Iron in Mo, Molybdate LR, Molybdate HR, Ozone, Polyacrylate, Sulphate, Triazoles, Zinc</b> (delivery without reagents)	29 62 402
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## 3in1

Test	Code
<b>MD 110 Chlorine, pH, Cyanuric Acid</b> tablet reagents 0,01 - 6,0 mg/l Cl <sub>2</sub> / 0,1 - 10 mg/l Cl <sub>2</sub> * 6,5 - 8,4 pH / 0 - 160 mg/l cyanuric acid	29 80 102
<b>MD 110 Chlorine, pH, Cyanuric Acid</b> liquid reagent for chlorine and pH 0,02 - 4 mg/l Cl <sub>2</sub> / 6,5 - 8,4 pH 0 - 160 mg/l cyanuric acid	29 80 152

## 4in1

Test	Code
<b>MD 110 Chlorine, pH, Cyanuric Acid, Alkalinity-M (total)</b> tablet reagents 0,01 - 6,0 mg/l Cl <sub>2</sub> / 0,1 - 10 mg/l Cl <sub>2</sub> * 6,5 - 8,4 pH / 0 - 160 mg/l cyanuric acid 5 - 200 mg/l CaCO <sub>3</sub> (TA)	29 80 702
<b>MD 110 Chlorine, pH, Cyanuric Acid, Alkalinity-M (total)</b> liquid reagent for chlorine and pH 0,02 - 4 mg/l Cl <sub>2</sub> / 6,5 - 8,4 pH 0 - 160 mg/l cyanuric acid / 5 - 200 mg/l CaCO <sub>3</sub> (TA)	29 80 752

## 6in1

Test	Code
<b>MD 110 Chlorine, Bromine, pH, Cyanursäure, Alkalinity-M (total), Calcium hardness</b> tablet reagents 0,01 - 6,0 mg/l Cl <sub>2</sub> / 0,1 - 10 mg/l Cl <sub>2</sub> * 0,05 - 13 mg/l Br / 6,5 - 8,4 pH 0 - 160 mg/l cyanuric acid / 5 - 200 mg/l CaCO <sub>3</sub> (TA) 0 - 500 mg/l CaCO <sub>3</sub> (CaH)	29 80 902

\* Delivery without reagents for measuring range 0.1 - 10 mg/l Cl<sub>2</sub>

 Please see pages 50 onwards for reagents (order codes)

## Data Transfer

The photometer MD 110 has integrated **Bluetooth®** functionality. The app AquaLX® is the ideal supplement to the Lovibond® photometer. Measurement results are transmitted via the

**Bluetooth®** interface for fast evaluation or administration on smartphones or tablets. All data can be handled and allocated immediately, on-site. The app displays all results in a clear graphic with

min. and max. values and supports the export of the data as an Excel® compatible CSV file. For further information, please refer to [www.lovibond.com/bluetooth](http://www.lovibond.com/bluetooth)

