MD 100 Photometer

Precise Water Analysis in High-Quality Design

Small I Mobile I Rapid

The MD 100 uses high quality interference filters with long-life LEDs as a light source without any moving parts in a transparency 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
Aluminium, tablet reagents 0.01 - 0.3 mg/l Al	27 62 00
Aluminium, powder reagents 0.01 - 0.25 mg/l Al	27 62 05
Ammonia, tablet reagents 0.02 - 1.0 mg/l N	27 60 60
Ammonium, powder reagents 0.01 - 0.8 mg/l N	27 60 65
Ammonia, free powder reagents 0.01 - 0.5 mg/l N **Monochloramine** 0.04 - 4.5 mg/l Cl_2	27 60 70
Chlorine, tablet reagents **(OTZ)** 0.01 - 6.0 mg/l Cl_2 / 0.1 - 10 mg/l Cl_2*	27 60 00
Chlorine, liquid reagent **(OTZ)** 0.02 - 4 mg/l Cl_2	27 60 05
Chlorine DUO, for 2 types of reagents 1) Tablet reagents 0.01 - 6.0 mg/l Cl_2 / 0,1 - 10 mg/l Cl_2* 2) Powder reagents 0.02 - 2.0 mg/l Cl_2 (ø 24 mm glass vial) 0.1 - 8.0 mg/l Cl_2 (ø 10 mm **multi vial-2**)	27 60 20 27 60 25
Chlorine, powder reagents 0.02 - 2.0 mg/l Cl_2 (ø 24 mm glass vial) 0.1 - 8.0 mg/l Cl_2 (ø 10 mm **multi vial-2**)	27 60 10
Chlorine HR (Potassium iodide) tablet reagents 5 - 200 mg/l Cl_2 (ø 16 mm round vial & adapter)	27 61 70
Chlorine dioxide, tablet reagents 0.02 - 11 mg/l ClO_2	27 60 30
Chlorine dioxide, powder reagents 0.02 - 3.8 mg/l ClO_2	27 60 35
COD, tube tests, without reagents 0 - 150 mg/l O_2 (ø 16 mm) 0 - 1500 mg/l O_2 (ø 16 mm) 0 - 15000 mg/l O_2 (ø 16 mm)	27 61 20
Copper, tablet reagents 0.05 - 5.0 mg/l Cu	27 60 80
Copper, powder reagents 0.05 - 5.0 mg/l Cu	27 60 85

Single-Parameter

Test	Code
Hardness, total, tablet reagents 2 - 50 mg/l $CaCO_3$ 20 - 500 mg/l $CaCO_3$ (by dilution)	27 61 90
Hazen, no reagents required 0 - 500 mg/l Pt-Co	27 61 60
Iron, tablet reagents 0.02 - 1.0 mg/l Fe	27 60 50
Iron TPTZ, powder reagents 0.02 - 1.8 mg/l Fe	27 60 55
Iron, powder reagents 0.02 - 3.0 mg/l Fe	27 60 56
Fluoride, without reagents 0.05 - 2.0 mg/l F^-	27 60 90
Manganese LR, tablet reagents 0.2 - 4.0 mg/l Mn	27 61 00
Manganese LR, powder reagents 0.01 - 0.7 mg/l Mn	27 61 05
Manganese HR, powder reagents 0.1 - 18 mg/l Mn	27 61 06
Molybdenum LR Powder reagents / reagent solution 0.03 - 3.0 mg/l Mo (mixing cylinder required, not included)	27 61 40
Molybdenum HR, powder reagents 0.3 - 40 mg/l Mo	27 61 41
Molybdenum, tablet reagents 0.6 - 30 mg/l Mo	27 61 42
Monochloramine powder reagents 0.04 - 4.5 mg/l Cl_2	27 60 70
Phosphate, tablet reagents 0.05 - 4.0 mg/l PO_4	27 60 40
Phosphate, powder reagents 0.06 - 2.5 mg/l PO_4	27 60 45
Silica, tablet reagents 0.05 - 4.0 mg/l SiO_2	27 61 10
Silica LR, powder reagents 0.1 - 1.6 mg/l SiO_2	27 61 15
Silica HR, powder reagents 1 - 90 mg/l SiO_2	27 61 16
Suspended solids no reagents required 0 - 750 mg/l TSS	27 61 50
Urea, tablet reagents 0.1 - 2.5 mg/l Urea 0.2 - 5 mg/l Urea (by dilution)	27 62 10

2in1

Test	Code
Chlorine, pH, tablet reagents **(OTZ)** 0.01 - 6.0 mg/l Cl_2 / 0,1 - 10 mg/l Cl_2* 6.5 - 8.4 pH	27 80 20
Chlorine, pH, liquid reagent **(OTZ)** 0.02 - 4 mg/l Cl_2 / 6.5 - 8.4 pH	27 80 25
Chlorine, pH, powder reagents for chlorine 0.02 - 2.0 mg/l Cl_2 (ø 24 mm glass vial) 0.1 - 8.0 mg/l Cl_2 (ø 10 mm **multi vial-2**) 6.5 - 8.4 pH	27 80 30

3in1

Test	Code
Chlorine, pH, Stabilizer tablet reagents **(OTZ)** 0.01 - 6.0 mg/l Cl_2 / 0,1 - 10 mg/l Cl_2* 6.5 - 8.4 pH ; 0 - 160 mg/l cyanuric acid	27 80 10
Chlorine, pH, Stabilizer liquid reagent for chlorine and pH **(OTZ)** 0.02 - 4 mg/l Cl_2 / 6.5 - 8.4 pH 2 - 160 mg/l cyanuric acid	27 80 15
Chlorine, pH, Alkalinity-M tablet reagents **(OTZ)** 0.01 - 6.0 mg/l Cl_2 / 0,1 - 10 mg/l Cl_2* 6.5 - 8.4 pH ; 5 - 200 mg/l $CaCO_3$ (TA)	27 80 60
Chlorine, pH, Alkalinity-M (total) liquid reagent for chlorine and pH **(OTZ)** 0.02 - 4 mg/l Cl_2 / 6.5 - 8.4 pH 5 - 200 mg/l $CaCO_3$ (TA)	27 80 65
Chlorine LR, Chlorine HR, Chlorine dioxide#, tablet reagents 0.01 - 6.0 mg/l Cl_2 5 - 200 mg/l Cl_2 (ø 16 mm round vial) 0.02 - 11 mg/l ClO_2	27 80 00

4in1

Test	Code
Chlorine, pH, Stabilizer, Alkalinity-M, tablet reagents **(OTZ)** 0.02 - 6.0 mg/l Cl_2 / 0,1 - 10 mg/l Cl_2* 6.5 - 8.4 pH ; 0 - 160 mg/l cyanuric acid 5 - 200 mg/l $CaCO_3$ (TA)	27 80 70
Chlorine, pH, Stabilizer, Alkalinity-M (total) liquid reagent for chlorine and pH **(OTZ)** 0.02 - 4 mg/l Cl_2 / 6.5 - 8.4 pH 2 - 160 mg/l cyanuric acid / 5 - 200 mg/l $CaCO_3$ (TA)	27 80 75

5in1

Test	Code
Chlorine, pH, Stabilizer, Alkalinity-M, Calcium hardness tablet reagents **(OTZ)** 0.02 - 6.0 mg/l Cl_2 / 0,1 - 10 mg/l Cl_2* 6.5 - 8.4 pH ; 0 - 160 mg/l cyanuric acid 5 - 200 mg/l $CaCO_3$ (TA) ; 0 - 500 mg/l $CaCO_3$ (CaH)	27 80 80

6in1

Test	Code
Chlorine, Bromine, pH, Stabilizer, Alkalinity-M, Calcium hardness, tablet reagents **(OTZ)** 0.02 - 6.0 mg/l Cl_2 / 0,1 - 10 mg/l Cl_2* 0.05 - 13 mg/l Br ; 6.5 - 8.4 pH 0 - 160 mg/l cyanuric acid ; 5 - 200 mg/l $CaCO_3$ (TA) 0 - 500 mg/l $CaCO_3$ (CaH)	27 80 90

* Delivery without reagents
for measuring range 0.1 - 10 mg/l Cl_2

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

MD 100 Photometer

Technical Data

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 Δ λ = 5 nm 530 nm Δ λ = 5 nm 560 nm Δ λ = 5 nm 580 nm Δ λ = 5 nm 610 nm Δ λ = 6 nm 660 nm Δ λ = 5 nm
Wavelength Accuracy	± 1 nm
Photometric Accuracy[4]	3% FS (T = 20°C – 25°C)
Photometric Resolution	0.01 A
Power Supply	4 micro batteries (AAA), capacity approx. 17 hours or 5000 tests
Auto - OFF	automatic switch-off
Display	backlit LCD (on keypress)
Storage	internal ring memory for 16 data sets
Interfaces	infrared interface for test data transfer
Additional feature	real time clock and date
Calibration	factory calibration and user calibration. Reset to factory calibration possible
Dimensions	155 x 75 x 35 mm (L x W x H)
Weight	basic unit approx. 260 g
Environmental conditions	temperature: 5 – 40 °C rel. humidity: 30 – 90% (non condensing)
CE-Conformity	

[4] tested with standard solutions

Scroll Memory (SM)

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

Zero Setting (OTZ)

For certain versions of the instrument it is not necessary to zero the instrument each time. The zero setting is held in memory until the device is turned off. (**O**ne **T**ime **Z**ero - OTZ). The zero setting can be confirmed whenever it is useful.

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)

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
- Guarantee sheet
- Certificate (COC)
- Instruction Manual

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
Infra-red data transfer modul IRiM	21 40 50

Please see pages 78 onwards for reagents (order codes)

Data transfer

The optional available IRiM (infra-red interface modul) uses modern infra-red 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[1)] or alternatively a serial printer[2)].

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[1)] USB or alternatively a printer with a serial plug-in connected to the IRiM.

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

[1)] USB printer: HP Deskjet 6940 ; [2)] each ASCII printer

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.
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 (VARIO) 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