

# Photometer AL100

## Precise Water Analysis in High-Quality Design



The AL100 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 AL100 is also suitable for use as a testing instrument.

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

### 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 (**One Time Zero - 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 AL100, 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)

 **Reagents (order codes), please see pages 34 onwards**

8

### Highlights

- Scroll Memory
- Automatic Switch-Off
- Real-Time-Clock and Date
- Calibration Mode
- Backlit Display
- Storage Function
- One Time Zero (OTZ)
- Waterproof <sup>\*)</sup>

<sup>\*)</sup> as defined in IP 68, 1 hour at 0.1 meter

## Single-Parameter

Test	Code
<b>Aluminium</b> , tablet reagents 0.01 - 0.3 mg/l Al	4276200
<b>Aluminium</b> , powder reagents 0.01 - 0.25 mg/l Al	4276205
<b>Ammonia</b> , tablet reagents 0.02 - 1.0 mg/l N	4276060
<b>Ammonium</b> , powder reagents 0.01 - 0.8 mg/l N	4276065
<b>Chloride</b> , tablet reagents 0.5 - 25 mg/l Cl <sup>-</sup> 5 - 250 mg/l Cl <sup>-</sup> (by dilution)	4276180
<b>Chlorine</b> , tablet reagents (OTZ) 0.01 - 6.0 mg/l Cl <sub>2</sub> / 0.1 - 10 mg/l Cl <sub>2</sub> <sup>*</sup>	4276000
<b>Chlorine</b> , liquid reagents (OTZ) 0.02 - 4 mg/l Cl <sub>2</sub>	4276005
<b>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> <sup>*</sup>	4276020
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> )	4276025
<b>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> )	4276010
<b>Chlorine HR (Potassium iodide)</b> , tablet reagents 5 - 200 mg/l Cl <sub>2</sub> (ø 16 mm round vial & adapter)	4276170
<b>Chlorine dioxide</b> , tablet reagents 0.02 - 11 mg/l ClO <sub>2</sub>	4276030
<b>Chlorine dioxide</b> , powder reagents 0.04 - 3.8 mg/l ClO <sub>2</sub>	4276035
<b>COD</b> , tube tests (ø 16 mm) 0 - 150 mg/l O <sub>2</sub> / 0 - 1500 mg/l O <sub>2</sub> / 0 - 15000 mg/l O <sub>2</sub>	4276120
<b>Copper</b> , tablet reagents 0.05 - 5.0 mg/l Cu	4276080
<b>Copper</b> , powder reagents 0.05 - 5.0 mg/l Cu	4276085
<b>Fluoride</b> , without reagents 0.05 - 2.0 mg/l F <sup>-</sup>	4276090
<b>Hardness, total</b> , tablet reagents 2 - 50 mg/l CaCO <sub>3</sub> / 20 - 500 mg/l CaCO <sub>3</sub> (by dilution)	4276190
<b>Hazen</b> , no reagents required 0 - 500 mg/l Pt-Co	4276160
<b>Iron</b> , tablet reagents 0.02 - 1.0 mg/l Fe	4276050
<b>Iron TPTZ</b> , powder reagents 0.02 - 1.8 mg/l Fe	4276055
<b>Iron</b> , powder reagents 0.02 - 3.0 mg/l Fe	4276056
<b>Manganese LR</b> , tablet reagents 0.2 - 4.0 mg/l Mn	4276100
<b>Manganese LR</b> , powder reagents 0.01 - 0.7 mg/l Mn	4276105
<b>Manganese HR</b> , powder reagents 0.1 - 18 mg/l Mn	4276106
<b>Molybdenum LR</b> , powder reagents / reagent solution 0.03 - 3.0 mg/l Mo (mixing cylinder required, not included)	4276140
<b>Molybdenum HR</b> , powder reagents 0.3 - 40 mg/l Mo	4276141
<b>Molybdenum</b> , tablet reagents 0.6 - 30 mg/l Mo	4276142
<b>Phosphate</b> , tablet reagents 0.05 - 4.0 mg/l PO <sub>4</sub>	4276040
<b>Phosphate</b> , powder reagents 0.06 - 2.5 mg/l PO <sub>4</sub>	4276045
<b>Silica</b> , tablet reagents 0.05 - 4.0 mg/l SiO <sub>2</sub>	4276110
<b>Silica LR</b> , powder reagents 0.1 - 1.6 mg/l SiO <sub>2</sub>	4276115
<b>Silica HR</b> , powder reagents 1 - 90 mg/l SiO <sub>2</sub>	4276116

## Single-Parameter

Test	Code
<b>Suspended solids</b> , no reagents required 0 - 750 mg/l TSS	4276150
<b>Urea</b> , tablet reagents 0.1 - 2.5 mg/l Urea 0.2 - 5 mg/l Urea (by dilution)	4276210
<b>2in1</b>	
<b>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> <sup>*</sup> ; 6.5 - 8.4 pH	4278020
<b>Chlorine, pH</b> , liquid reagent (OTZ) 0.02 - 4 mg/l Cl <sub>2</sub> / 6.5 - 8.4 pH	4278025
<b>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	4278030
<b>3in1</b>	
<b>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> <sup>*</sup> 6.5 - 8.4 pH ; 0 - 160 mg/l Cyanuric acid	4278010
<b>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	4278015
<b>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> <sup>*</sup> 6.5 - 8.4 pH ; 5 - 200 mg/l CaCO <sub>3</sub> (TA)	4278060
<b>Chlorine, pH, Alkalinity-M</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)	4278065
<b>Chlorine LR, Chlorine HR, Chlorine dioxide<sup>#</sup></b> , 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>	4278000
<b>4in1</b>	
<b>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> <sup>*</sup> ; 6.5 - 8.4 pH 0 - 160 mg/l cyanuric acid ; 5 - 200 mg/l CaCO <sub>3</sub> (TA)	4278070
<b>Chlorine, pH, Cyanuric acid, Alkalinity-M</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)	4278075
<b>5in1</b>	
<b>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> <sup>*</sup> ; 6.5 - 8.4 pH ; 0 - 160 mg/l Cyanursäure 5 - 200 mg/l CaCO <sub>3</sub> (TA) ; 0 - 500 mg/l CaCO <sub>3</sub> (CaH)	4278080
<b>6in1</b>	
<b>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> <sup>*</sup> ; 0.05 - 13 mg/l Br 6.5 - 8.4 pH ; 0 - 160 mg/l Cyanursäure 5 - 200 mg/l CaCO <sub>3</sub> (TA) ; 0 - 500 mg/l CaCO <sub>3</sub> (CaH)	4278090
<b>AL100 Boiler Water</b> (without reagents) Aluminium, Chloride, Copper, DEHA, Hydrazine, Iron, Oxygen (dissolved), Phosphate, Polyacrylates, Silica	4276230
<b>AL100 Cooling Water</b> (without reagents) Aluminium, Bromine, Chlorine, Chlorine HR, Chlorine dioxide, Copper, Iron, Molybdate LR, Molybdate HR, Ozone, Polyacrylates, Sulphate, Triazoles, Zinc	4276240

\* 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.

# Photometer AL100



## Technical Data

<b>Optics</b>	LEDs, interference filters (IF) and photo sensors 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>Approval</b>	CE

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

## Reference Standard Kits for AL100

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.

<b>Kit Chlorine</b> for instruments with tablet / liquid reagent 0.2* and 1.0* mg/l	4275650
<b>Kit Chlorine</b> for instruments with tablet / liquid reagent 0.5* and 2.0* mg/l	4275655
<b>Kit Chlorine</b> for instruments with tablet / liquid reagent 1.0* and 4.0* mg/l	4275656
<b>Kit Chlorine</b> for instruments with powder reagent (VARIO) 0.2* and 1.0* mg/l	4275660
<b>Kit pH</b> for instruments with tablet / liquid reagent 7,45* pH	4275670

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

## Verification Standard Kit

The verification standard kit for the AL100 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 AL100 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.

<b>Verification Standard Kit</b>	4215670
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## Accessories

Item	Code
Set of 12 round vials with lid Height 48 mm, Ø 24 mm	197620
Set of 5 round vials with lid Height 48 mm, Ø 24 mm	197629
Set of 10 round vials with lid Height 90 mm, Ø 16 mm	197665
Adapter for round vials Ø 16 mm	19802220
Set of 12 plastic vials (PC), with lid "Multi"-Type 2, Ø 10 mm	197600
Vial stand for 6 round vials Ø 24 mm, acrylic glass	418951
Vial stand for 10 vials (Ø 16 mm or □ 13,5 mm), acrylic glass	418957
Mixing cylinder, 25 ml, with stopper required accessory for molybdenum LR test with AL100 (4276140)	19802650
Membrane filter set for use when preparing samples, 25 membrane filters, 0,45 µm, 2 syringes 20 ml	366150
Cleaning cloth for vials	197635
Set of 12 sealing rings for round vial Ø 24 mm	197626
4 micro batteries (AAA)	1950026
Measuring beaker, volume 100 ml	384801
Plastic funnel with handle	471007
Plastic stirring rod, 13 cm length	364100
Plastic stirring rod, 13 cm length, (10 pc.)	364120
Plastic stirring rod, 10 cm length	364109
Plastic stirring rod, 10 cm length, (10 pc.)	364130
Infra-red data transfer modul IRiM	4214050

## Delivery Content

Each AL100 is supplied in a sturdy plastic case with 4 micro batteries (AAA), 3 round vials (glass) with lids, 1 stirring rod & 1 syringe, tablet reagents and/or liquid reagents or VARIO powder reagent, warranty information, certificate (Certificate of Compliance) and instruction manual.

You can find updated information on parameters and measuring ranges on our website at [www.aqualytic.de](http://www.aqualytic.de)

## Data transfer

The optional available IRiM (infra-red interface modul) uses modern infra-red technology to transmit measurement data from the AL100 photometer to one of 3 optional interfaces. These interfaces can be used to connect to a PC, a USB printer<sup>1)</sup> or alternative 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 alternative a printer with a serial plug-in connected to the IRiM.

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

<sup>1)</sup> USB printer: HP Deskjet 6940 ; <sup>2)</sup> each ASCII printer

 Further information to the IRiM, see page 23

