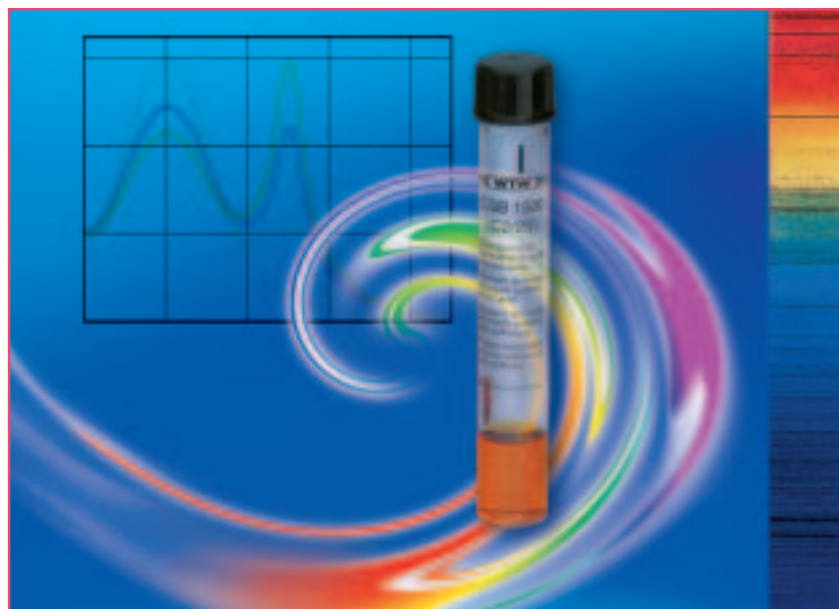




Photometry

Photometry



Photometric Methods

Photometry allows the concentrations of numerous parameters to be determined and is an important method for the measurement of wastewater and drinking water. Each specific test kit reacts with a particular substance to be measured. That reaction produces a specific color which is then analyzed.

The colored solution absorbs certain wavelengths contained in the white light spectrum. The photometric measurement normally takes place at the wavelength which is most influenced by the colored product. The photometer measures the intensity of the light at this wavelength before and after its passage through a cuvette containing the sample. The data stored in the computer are used to calculate the concentration.

Measuring Correctly

Precise measurements are only possible with test kits that are in the expected range of the sample to be measured. Choose the test kit that brackets your expected concentration range.



NEW

Photometry

The WTW photoLab® Photometer Series

Getting Results: simple, precise and quick

Simply insert cuvette: the concentration is displayed and stored. In WTW photometers, all necessary settings for the parameters to be determined are already stored as method data. Coded test kits makes the "AutoSelect" function possible. All method data in the photometer are available for download from the WTW home page (www.wtw.com) and can therefore be updated at any time using PC in combination with the AK Labor connection cable (optional accessory). A self-check is regularly performed at start up and during operation for continuously precise results.

Large Selection of Test Kits for Routine and specialized Tasks

Our ever expanding selection of test kits and the ability to automatically recognize either round or rectangular cuvette.

User-Defined Methods for simplified Determination of user-defined Parameters

WTW photometers can store user-defined method data to simplify your testing methods. This is either performed by direct entry into the photometer itself or – even easier – by using the optional Multi/ACHAT II software. Simply insert the cuvette, enter the method number and read the concentration value.

AQA/IQC

For important Analytical Quality Assurance (= AQA) or Internal Quality Control (=IQC) even more options are now available to ensure precise and reliable measuring results. Apart from regular checking of the photometer by means of the PhotoCheck function, tests can also be regularly checked using standard solutions, CombiChecks and PipeCheck (refer to Accessories). This inspection can be programmed in defined intervals. The AQA task is documented together with the measured result and appears on the printout.

Automatic self-check

AutoSelect

Automatic cuvette identification



Parameter

pH

ORP

ISE

Oxygen
(D.O.)

Conductivity

Multi-
parameter

BOD/
Respiration

Photometers

Turbidity

Colony
Counter

Software/
Printers



Which instrument for which Task?

- High-quality optics
- Bar Code Test Identification
- Expanded AQA/IQC functions



photoLab® S6 *page 79*
 Routine instrument with 6 wavelengths for all common routine determinations with reaction cuvettes, in particular for wastewater and drinking water; also available as a version equipped with rechargeable battery.

photoLab® S12 *page 80 - 81*
 All-round instrument with 12 wavelengths for all offered test kits in round and rectangular cuvettes for a larger measuring range. In addition, 50 user-defined methods and Kinetic measurements are possible; also available as a version equipped with rechargeable battery.

photoLab® Spektral *page 82 - 83*
 High quality. Variable spectral photometer equipped with Zeiss optics for all routine and specialized tasks in the VIS sector: all available test kits for round and rectangular cuvettes, Kinetics measurements, recording of absorption spectrums as well as 100 user-defined methods with selectable wavelength from 330-850 nm.

Thermoreactors for Digestions: *page 84 - 85*

CR 2200
 5 programs and 3 digestion temperatures for 12 reaction cuvettes

CR 3200
 5 programs and variable temperature up to 338 °F (170 °C) for 24 reaction cuvettes

CR 4200
 5 program and variable temperature up to 338 °F (170 °C) for 2 simultaneous programs with 2 x 12 reaction cuvettes

Reagents *page 86 - 91*
 all available tests from Al for aluminum to Zn for zinc

CombiCheck and Standard Solutions
 Everything required for AQA/IQC

General Notes on Reagents
 interesting facts from shelf life to disposal

Reagent-free Tests
 from color to turbidity

photoLab® Application

	photoLab® S6	photoLab® S12	photoLab® Spektral
Application areas	Routine measurements in wastewater and drinking water, Optional field use	Routine measurements in wastewater and drinking water, Comprehensive laboratory tests, Optional field use	Routine measurements in wastewater and drinking water, Professional instrument for comprehensive laboratory tasks in the VIS sector
Wavelengths	6 wavelengths: 340, 445, 525, 550, 605, 690 nm	12 wavelengths: 340, 410, 445, 500, 525, 550, 565, 605, 620, 665, 690, 820 nm	330 nm - 850 nm stepless
Optical system	Filter/Reference beam	Filter/Reference beam	Zeiss Spectrometer module
Special functions		Kinetics	Kinetics Absorption spectrums
Own methods	No	50	100
Cuvettes	Round 16 mm	Round and rectangular 10, 20, 50 mm	Round and rectangular 10, 20, 50 mm



Photometers

photoLab® S6

Photometers

Extended Functions for
AQA/IQC and Blanks

NEW



The Photometer for all simple and rapid Routine Wastewater and Drinking Water Measurements!

This photometer allows measurement of convenient rapid tests: simply lift the cover, insert the coded cuvette and read the result. The "AutoSelect" function performs all necessary settings. The cover serves both as dust cover and on switch. When the cover is opened, the instrument switches on and checks the optical system itself. It also holds frequently required short-form analytical procedures for mobile use.

The 4 function keys are used to perform repeat measurements for the same parameters, alternatively extinction measurement or **transmittance**, and operator-specific alterations to the basic settings as well as measurement of uncoded round cuvettes.

The large well-laid-out graphics display shows the reading unambiguously and provides operating instructions at the same time.

For quality assurance (AQA/IQC) measurement intervals can now be customized for individual parameters! User-defined blanks can be additionally stored. More than 500 measurement data including AQA information are stored and documented via the serial printer or PC (see *Software and Accessories* from page 102).

- Rapid tests
- AQA/IQC in time and measuring intervals
- Portable version with rechargeable battery

NEW Transmittance

Parameter

pH

ORP

ISE

Oxygen (D.O.)

Conductivity

Multi-parameter

BOD/Respiration

Photometers

Turbidity

Colony Counter

Software/Printers



Photometers

photoLab® S12

- User-defined methods
- Kinetics
- Field use with rechargeable battery option



The Photometer with expanded Test Kit selection for Professionals!

All available WTW test kits can be used for measurement in reaction cuvettes for rapid tests or in rectangular cuvettes with higher sensitivity. Apart from tests, the 12 available wavelengths and the underlying reference beam technology permit measurement of kinetics with excellent stability.

Simple and easy operation: lift the cover, insert the cuvette and read the result. The "AutoSelect" function performs all necessary settings and well-laid-out graphics display immediately shows the reading. Automatic recognition of the inserted cuvette.

The optical system has no moving parts to wear out and is supported by state-of-the-art electronics. The cover serves both as dust protection as well as an "on" switch with checking function: When the cover is opened, the instrument switches on and checks the optical system automatically.



NEW

- 50 User-Defined Methods
- AQA/IQC : Time and measuring intervals
- Blank Storage
- Transmittance

Extended Functions
for AQA/IQC and
50 User-Defined Methods

photoLab® S12 has 4 function keys which are used to perform repeat measurements for the same parameters, either extinction measurement or **transmittance**, and operator-specific alterations to the basic settings as well as measurement of uncoded cuvettes. In addition to the preprogrammed method data, a maximum of 50 user-defined method data can be entered via sample identification number using the numerical keyboard.

User-defined methods can also be easily entered using the Multi/ ACHAT II software from WTW which is connected to a PC by means of the AK Labor connection cable. User-defined methods are kept stored even after you have updated methods via download from the WTW home page. You also have the option of printing sample results of 1,000 stored data sets on a serial printer (see *Software and Accessories from page 102*).

For mobile measurements, photoLab® S12 is available as a rechargeable battery version with frequently required short-form analytical procedures for mobile use in the cover.





photoLab® Spektral



- Zeiss optics
- Absorption spectrums
- Kinetics

The all-round Instrument for laboratory Use

photoLab® Spektral is a variable photometer for the range of 330 nm to 850 nm with a free choice of wavelength. A high-quality Zeiss optical module is at the heart of this contains spectral photometer. Its no-wear technology no mechanical parts. In operating mode, the photometer carries out regular **AutoChecks** thus ensuring correct measuring results. These can be checked and documented using the AQA functions.

Comfortable Handling

photoLab® Spektral is as easy to use as every other photoLab® series photometer from WTW: "AutoSelect" for automatic test recognition of coded cuvette with all necessary wavelength and calibration settings. After inserting the cuvette, the large well-laid-out graphics display immediately shows the reading in the desired form. Up to 1,000 stored measured data can be output via PC or serial printer (see *Software and Accessories* from page 102).

photoLab® Spektral contains the complete range of available test kits. Updates of the stored method data are available for download from the WTW home page (www.wtw.com).



Photometers

User-Defined Methods

100 user-defined methods can be entered using the numerical keyboard. For this purpose, **photoLab® Spektral** is equipped with simplified functions for determining and storing required calibration data.

A comfortable input mask makes entry of user-defined methods via PC even easier. After storage you can thus select and perform your user-defined tests as easily as rapid tests by entering a three-digit method number.

Special Functions

In addition to routine tasks with the entire range of test kits, **photoLab® Spektral** can perform the specialized tasks of a spectral photometer:

Using the graphics functions, absorption spectrums can be clearly displayed and evaluated according to selected regions. Its special functions also facilitate the determination of reaction kinetics (for recording longer periods, the photometer should have been turned on for a respectively long period!).

For certain test kits turbidity corrections are performed simultaneously and displayed in the documentation.

Technical Data

Model	photoLab® S6 and S6-A	photoLab® S12 and S12-A	photoLab® Spektral
Type	Filter Photometer	Filter Photometer	Spectrophotometer with photodiode array technology
Photodiode array for	6 wavelengths	12 wavelengths	–
Wavelengths, nm	340, 445, 525, 550, 605, 690	340, 410, 445, 500, 525, 550, 565, 605, 620, 665, 690, 820	Range 330 ... 850, stepless
User-defined methods	–	50	100
Auto-zero adjustment	Yes	Yes	Yes
AutoSelect-function	Yes	Yes	Yes
Cuvette recognition	Yes	Yes	Yes
Cuvette type	Round	Round, 10 mm, 20 mm and 50 mm	Round, 10 mm, 20 mm and 50 mm
Rechargeable battery version	Yes	Yes	No
Data storage and time	500 data sets with date and time	1000 data sets with date and time	1000 data sets with date and time
Interface	RS 232	RS 232	RS 232
Operation with rechargeable batteries (optional)	1 working day, total discharge protection, maintenance charging during mains operation	1 working day, total discharge protection, maintenance charging during mains operation	–
Date/time	Real-time clock built in	Real-time clock built in	Real-time clock built in
Test marks	CE, UL, CUL	CE, UL, CUL	CE, UL, CUL
Warranty	2 years	2 years	2 years

Ordering Information

Model		Order No.
photoLab® S6	Mains operated version, 230 V European standard plug	250 013
photoLab® S6-A	Version with rechargeable batteries, 230 V European standard plug	250 022
photoLab® S12	Mains operated version, 230 V European standard plug	250 024
photoLab® S12-A	Version with rechargeable batteries, 230 V European standard plug	250 026
photoLab® Spektral	230 V/115 V plug-in transformer with 4 plug adaptors	250 028

Note: versions for other mains supplies/countries on request

Parameter

pH

ORP

ISE

Oxygen (D.O.)

Conductivity

Multi-parameter

BOD/Respiration

Photometers

Turbidity

Colony Counter

Software/Printers