PERSEE

PRODUCT BROCHURE

Affordable Lab Technology

Contents

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Since its development in the 1950's the UV-Visible Spectrophotometer has evolved into an accurate and reliable analytical tool and it has become one of the most utilised instruments in today's scientific laboratory.

UV-Visible spectroscopy is a mature and well established analytical technique used extensively in many industry sectors including Environmental Analysis, Pharmaceutical Testing, Food and Beverage Production to name but a few. Persee Analytics manufacture an extensive range of UV and Visible Spectroscopy instrumentation guaranteed to meet the needs of your application. Further information on the UV-Vis product line along with a brief introduction to UV-Vis Spectroscopy can be found in this brochure.

UV-Vis Spectroscopy

UV-Vis Spectroscopy is an analytical method used to measure the absorbance of ultra-violet or visible radiation through an analayte. The molecular absorption of the analayte corresponds to both excitation of valence electrons and excitation of electrons in different atomic orbitals.

UV-Vis Spectroscopy is an effective technique for both qualitative and quantitative analysis of organic and inorganic compounds.

UV-Vis Spectroscopy is based on the Lambert-Beer principle which states that the Absorbance of a solution (A) is directly proportional to its pathlength (l) and its concentration (c) when the wavelength of the incidence light remains fixed.

This is summarized in the following equation, where ε is the molar absorbtivity

$$A = \epsilon lc$$

UV-Vis Spectrophotometer

The UV-Vis Spectrophotometer is the analytical instrument used for the UV-Vis spectroscopic analysis. Spectrophotometers are available in different configurations however most can be categorized into either single beam, split beam or double beam types depending on the design of their optical system. Such types of instrument comprise the following components in their constructions:

- Light Source
- Monochromator
- Cell Compartment
- Detector
- Signal Processing System

Split Beam Spectroscopy

The Split beam approach to UV-Vis Spectroscopy uses a single beam of light separated into Sample and Reference beams by means of a beam splitter using a separate detector for each. Split beam instruments have a reference detector housed inside the instrument optics offering the advantage of optical stability as in double beam spectroscopy whilst using the single beam measurement technique.

Double Beam Spectroscopy

The double beam approach to UV-Vis spectroscopy requires two beams of light, both having the same intensity to measure the Absorbance through sample and reference positions simultaneously. The Sample position is used for measurement of the analyte, whereas the reference position is used for the correction against a blank solution or sample matrix.

A clear advantage of the double beam optical system is the improvement in measurement stability and drift precision as a result of having a real-time feedback of both the reference and sample signals.

T6

UV-VIS SPECTROPHOTOMETER

The T6 is a high performance compact split beam spectrophotometer with a fixed 2nm spectral bandwidth.

The T6 range consists of two models:

T6U (UV-Visible) operating within a wavelength range of 190 -1100nm. T6V (Visible) operating within a wavelength range of 325 -1100nm.

The instrument has a switched mode power supply accepting voltages in the range of 95 - 240V AC and supplied with either universal pathlength 5 cell changer or fixed path length 8 cell changer as standard.

The T6 delivers the functionality and accuracy of an advanced instrument at an affordable price.

FEATURES & FUNCTIONS

- High performance fixed 2nm spectral bandwidth.
- Low stray light 0.05%T (T60U).
- Wavelength accuracy +/- 1nm (T60U).
- Holographic blazed grating 1200lines/mm.
- Local control software for photometric fixed wavelength measurement.
- Easily upgraded to include quantitative analysis, multi wavelength spectrum & kinetics.
- Built in cell holder storage.
- Robust modular design with a small footprint.
- Can be used with UV-WIN software (optional).


Fixed pathlength 8-cell changer

T6 continued

OPTICAL SYSTEM & COMPONENTS

High quality optical components ensure reliable analytical data with low stray light achieved using very low noise electronic circuits.

Deuterium and tungsten light sources deliver superior stability across the full wavelength range. Both types of lamp have self timers and are inexpensive and easy to replace when required.

The monochromator is completely sealed and the optical surfaces can be easily cleaned to maintain optimum reflectivity over the lifetime of the instrument.

A maintenance free high resolution direct stepper drive positions the grating precisely, which ensures reproducible wavelength scanning at different scan speeds, thus negating any wavelength peak shift.

The spectrophotometer shell is made from an environmentally friendly non corrosive material and a

Cell holder

Program card

Specifications

T6U (UV-Visible)		T6V (Visible)
Optical system	Split beam ratio	Split beam ratio
Scan speed	Selectable	Selectable
Wavelength range	190 -1100nm	325 -1100nm
Wavelength accuracy	±1nm	± 2nm
Wavelength reproducibility	≤ 0.2nm	≤ 0.4nm
Spectral bandwidth	2nm	2nm
Photometric mode	Transmittance, Absorbance, Energy	Transmittance, Absorbance, Concentration
Photometric range	-0.3-3.0Abs	-0.3-3.0Abs
Photometric accuracy	0.002A (0-0.5A), 0.004A (0.5 -1A) 0.3%T (0 -100%T)	0.002A (0 - 0.5A), 0.004A (0.5 - 1A) 0.3%T (0 -100%T)
Photometric reproducibility	0.001A (0 - 0.5A), 0.002A (0.5 - 1A) 0.15%T (0 -100%T)	0.001A (0 - 0.5A), 0.002A (0.5 - 1A) 0.15%T (0 -100%T)
Photometric noise	0.001A (500nm) 30min warm-up	0.001A (500nm) 30min warm-up
Baseline flatness	0.002A (200 -1000nm)	0.002A (325 -1000nm)
Baseline stability	0.001A/h (500nm,0Abs), 2hr warm-up	0.002A/h (500nm,0Abs), 2hr warm-up
Stray light	≤ 0.05%T (220nm Nal, 340nm $NaNO_2$)	≤ 1.0%T (340nm $NaNO_2$)
Standard Functionality	Photometric Measurement (Quantitative, Multi-wavelength, Spectrum and Kinetic measurements with program cards)	Photometric & Quantitative Measurement
Detector	Silicon photo diode	Silicon photo diode
Light source	Tungsten Halogen and Deuterium arc lamps	Tungsten Halogen
Display	Digital LCD display	Digital LCD Display
Printer	Mini Printer	Mini Printer
PC Interface	RS232	RS232
Software support	Local and UV-Win	Local and UV-Win
Power supply	Switch mode 95 - 250VAC 50 - 60Hz	Switch mode 95 - 250VAC 50 - 60Hz
Weight	11kg	11kg
Dimensions (Width, Depth, Height)	476(mm), 362(mm), 225(mm)	476(mm), 362(mm), 225(mm)

Each Unit is supplied with the following as standard:

1 x Certificate of conformity

1 Pair of quartz cells (T6U), glass cells (T6V)

1 x Quantitative program card (T6U Only)

1 x Black block for dark current correction

1 x Fuse (2A)

1 x Power cord

1 x Instruction manual

1 x Dust cover

1 x Packing list

T7

UV-VIS SPECTROPHOTOMETER

The T7 is a high performance split beam spectrophotometer available with a fixed (2nm) or variable (0.5, 1, 2, 5nm) spectral bandwidth, which is innovative in terms of instrument application, mechanical and optical design, electronic control and software whilst retaining features that are well established and accepted through the industry.

The T7 series of UV-Visible Spectrophotometers are able to carry out photometric measurement, spectrum scans, quantitative determination and DNA/Protein analysis. When interfaced to a PC using the UV-Win software, many more features are available including three dimensional spectrum, kinetic measurements, method and data storage, exportation of data in multiple formats and GLP administration features. Both instruments have a spectral range of 190-1100nm.

The T7 range consists of two models:

T7 UV-Vis instrument offering a fixed bandwidth of 2nm.

T74 UV-Vis instrument offering a variable bandwidth of 0.5, 1, 2 or 5nm.

FEATURES & FUNCTIONS

- High performance fixed (2nm) or variable (0.5, 1, 2, 5nm) spectral bandwidth.
- Wavelength accuracy +/- 0.3nm.
- Supplied with a motorised 8 cell changer and pre-aligned Tungsten and Deuterium lamps.
- Holographic blazed grating 1200 lines /mm.
- High degree of automation requiring minimal key depressions to start analysis.
- A number of optional accessories available which increase the flexibility of the analysis.
- Analysis for photometric measurement, spectrum scans, quantitative determination and DNA/Protein analysis.
- UV-Win software gives additional functionality including 3D spectrum analysis and compliance with GLP protocol.
- Simple mechanical structure and modular electronics make routine maintenance very easy.

T7 continued

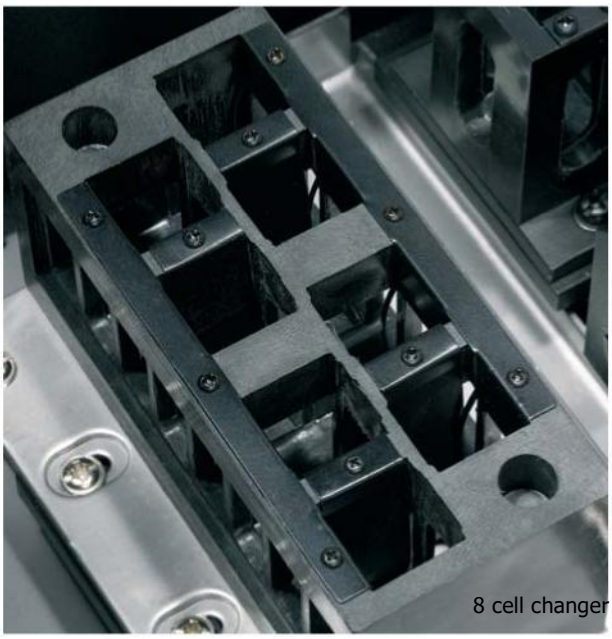
OPTICAL SYSTEM & COMPONENTS

High quality optical components ensure reliable analytical data with low stray light achieved using very low noise electronic circuits.

The split beam ratio optics ensures good optical stability.

Pre-aligned Deuterium and tungsten light sources deliver superior stability across the full wavelength range. Both types of lamps are inexpensive and easy to replace when required.

The modular design allows easy access to all optical surfaces which can be easily cleaned to maintain optimum reflectivity over the lifetime of the instrument.



8 cell changer

Specifications

Instrument Type	T7	T7S
Optical System	Split beam ratio	Split beam ratio
Scan Speed	Selectable	Selectable
Wavelength Range	190 -1100nm	190 -1100nm
Wavelength Accuracy	± 0.3nm	± 0.3nm
Wavelength Reproducibility	≤ 0.2nm	≤ 0.2nm
Spectral Bandwidth	2nm	0.5, 1.0, 2.0, 5.0nm
Photometric Mode	Transmittance, Absorbance, Energy Concentration	Transmittance, Absorbance, Energy Concentration
Photometric Range	-0.3-3.0Abs	-0.3-3.0Abs
Photometric Accuracy	0.002A (0 - 0.5A), 0.004A (0.5 -1.0A), 0.3%T (0 - 100%T)	0.002A (0 - 0.5A), 0.004A (0.5 - 1.0A), 0.3%T (0 -100%T)
Photometric Reproducibility	0.001A (0 - 0.5A), 0.002A (0.5 - 1.0A), 0.15%T (0 -100%T)	0.001A (0 - 0.5A), 0.002A (0.5 - 1.0A), 0.15%T (0 -100%T)
Photometric Noise	0.001A (500nm) 30min warm-up	0.001A (500nm) 30min warm-up
Baseline Flatness	0.002A (200 - 1000nm)	0.002A (200 - 1000nm)
Baseline Stability	0.001A/h (500nm, 0Abs), 2hr warm-up	0.001A/h (500nm, 0Abs), 2hr warm-up
Stray light	≤ 0.12%T (220nm Nal, 340nm $NaNO_2$)	≤ 0.12%T (220nm Nal, 340nm $NaNO_2$)
Standard Functionality	Photometric, Quantitative, Spectrum and DNA measurements.	Photometric, Quantitative, Spectrum and DNA measurements.
Cell Holder	Automatic 8 Cell changer	Automatic 8 cell changer
Detector	Silicon photo diode	Silicon photo diode
Light Source	Tungsten Halogen and Deuterium arc lamps	Tungsten Halogen and Deuterium arc lamps
Display	Digital LCD display	Digital LCD display
Printer	Not available	Not available
PC Interface	RS232/USB	RS232/USB
Software Support	Local and UV Win	Local and UV Win
Power Supply	Switchable 120 - 230VAC 50 - 60Hz	Switchable 120 - 230VAC 50 - 60Hz
Weight	25Kg	25Kg
Dimensions (Width, Depth, Height)	520mm, 420mm, 230mm	520mm, 420mm, 230mm

Each Unit is supplied with the following as standard:

1 x Certificate of conformity

1 x 8 position 10mm path length motorised cell holder

1 Pair 10mm Quartz cells

1 x Black block for dark current correction

1 x Fuse (2A)

1 x Power cord

1 x Instruction manual

1 x Dust cover

1 x Packing list

TZD

UV-VIS SPECTROPHOTOMETER

The T7D is a high performance double beam spectrophotometer available with a fixed (2nm) or variable (0.5, 1, 2, 5nm) spectral bandwidth, which is innovative in terms of instrument application, mechanical and optical design, electronic control and software whilst retaining features that are well established and accepted through the industry.

The T7D series of UV-Visible Spectrophotometers are able to carry out photometric measurement, spectrum scans, quantitative determination and DNA/Protein analysis. When interfaced to a PC using the UV-Win software, many more features are available including three dimensional spectrum, kinetic measurements, method and data storage, exportation of data in multiple formats and GLP administration features. Both instruments have a spectral range of 190-1100nm.

The T7D range consists of two models:

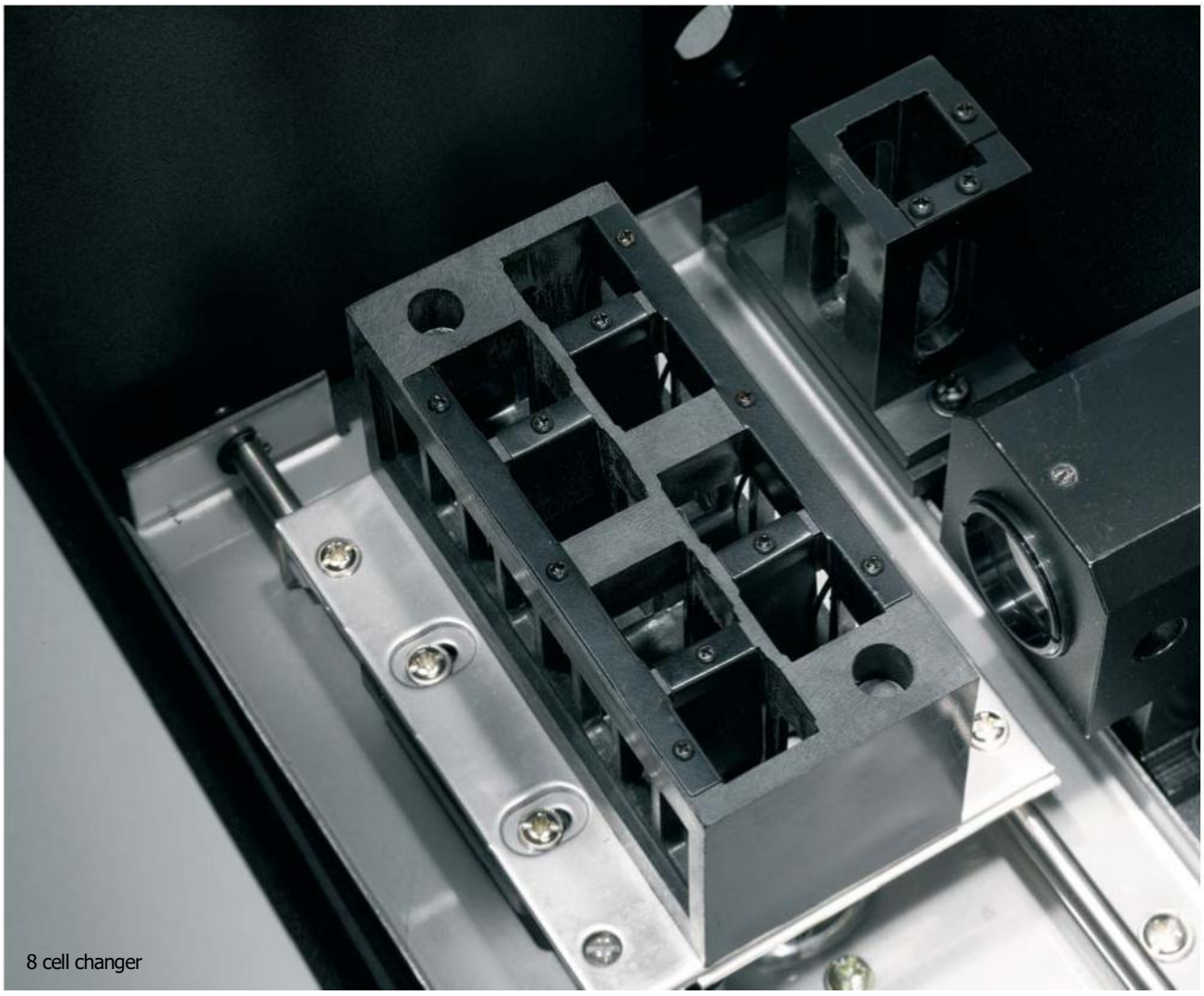
T7D UV-Vis instrument offering a fixed bandwidth of 2nm.

T7DS UV-Vis instrument offering a variable bandwidth of 0.5, 1, 2 or 5nm.

FEATURES & FUNCTIONS

- High performance fixed (2nm) or variable (0.5, 1, 2, 5nm) spectral bandwidth.
- Wavelength accuracy +/- 0.3nm.
- Supplied with a motorised 8 cell changer and pre-aligned Tungsten and Deuterium lamps.
- Holographic blazed grating 1200 lines /mm.
- High degree of automation requiring minimal key depressions to start analysis.
- A number of optional accessories available which increase the flexibility of the instrument.
- Analysis for photometric measurement, spectrum scans, quantitative determination and DNA/Protein analysis.
- UV-Win software gives additional functionality including 3D spectrum analysis and compliance with GLP protocol.
- Simple mechanical structure and modular electronics make routine maintenance very easy.

T7D continued



8 cell changer

OPTICAL SYSTEM & COMPONENTS

High quality optical components ensure reliable analytical data with low stray light achieved using very low noise electronic circuits.

The double beam optics ensure good optical stability.

Pre-aligned Deuterium and Tungsten light sources deliver superior stability across the full wavelength range. Both types of lamps are inexpensive and easy to replace when required.

The modular design allows easy access to all optical surfaces which can be easily cleaned to maintain optimum reflectivity over the lifetime of the instrument.

Specifications

Instrument Type	T7D	T7DS
Optical System	Double beam	Double beam
Scan Speed	Selectable	Selectable
Wavelength Range	190 -1100nm	190 -1100nm
Wavelength Accuracy	± 0.3nm	± 0.3nm
Wavelength Reproducibility	δ 0.2nm	δ 0.2nm
Spectral Bandwidth	2nm	0.5, 1.0, 2.0, 5.0nm
Photometric Mode	Transmittance, Absorbance, Energy Concentration	Transmittance, Absorbance, Energy Concentration
Photometric Range	-0.3 - 3.0Abs	-0.3 - 3.0Abs
Photometric Accuracy	0.002A (0 - 0.5A), 0.004A (0.5 -1.0A), 0.3%T (0 -100%T)	0.002A (0 - 0.5A), 0.004A (0.5 - 1.0A), 0.3%T (0 -100%T)
Photometric Reproducibility	0.001A (0 - 0.5A), 0.002A (0.5 - 1.0A), 0.15%T (0 -100%T)	0.001A (0 - 0.5A), 0.002A (0.5 -1.0A), 0.15%T (0 - 100%T)
Photometric Noise	0.001A (500nm) 30min warm-up	0.001A (500nm) 30min warm-up
Baseline Flatness	0.0015A (200 -1000nm)	0.0015A (200 -1000nm)
Baseline Stability	0.0008A/h (500nm, 0Abs), 2hr warm-up	0.0008A/h (500nm, 0Abs), 2hr warm-up
Stray light	≤ 0.12%T (220nm Nal, 340nm $NaNO_2$)	≤ 0.12%T (220nm Nal, 340nm $NaNO_2$)
Standard Functionality	Photometric, Quantitative, Spectrum and DNA measurements.	Photometric, Quantitative, Spectrum and DNA measurements.
Cell Holder	Automatic 8 Cell changer	Automatic 8 cell changer
Detector	Silicon photo diode	Silicon photo diode
Light Source	Tungsten Halogen and Deuterium arc lamps	Tungsten Halogen and Deuterium arc lamps
Display	Digital LCD display	Digital LCD display
Printer	Not available	Not available
PC Interface	RS232/USB	RS232/USB
Software Support	Local and UV Win	Local and UV Win
Power Supply	Switchable 120 - 230VAC 50 - 60Hz	Switchable 120 - 230VAC 50 - 60Hz
Weight	25Kg	25Kg
Dimensions (Width, Depth, Height)	520mm, 420mm, 230mm	520mm, 420mm, 230mm

Each Unit is supplied with the following as standard:

1 x Certificate of conformity

1 x 8 position 10mm path length motorised cell holder

1 Pair 10mm Quartz cells

1 x Black block for dark current correction

1 x Fuse (2A)

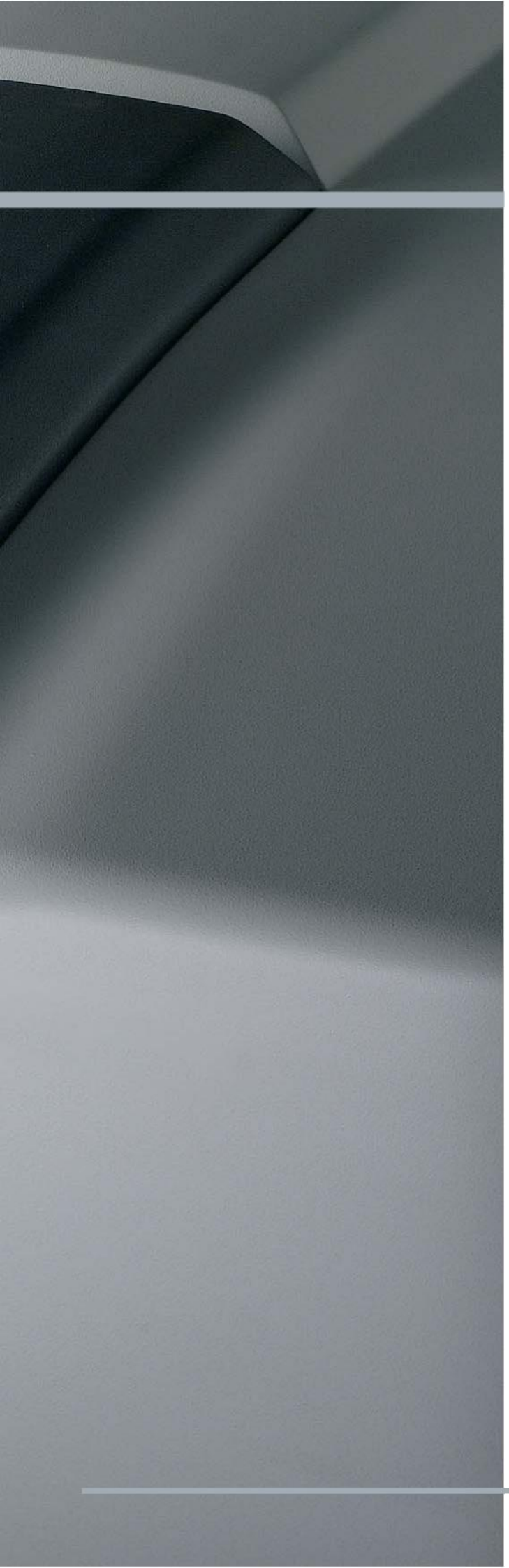
1 x Power cord

1 x Instruction manual

1 x Packing list

T8DCS

UV-VIS SPECTROPHOTOMETER



The T8DCS is a high performance double beam spectrophotometer with a variable spectral bandwidth from 0.1- 5nm, selected by a continuous variable slit.

The Czerny-Turner monochromator with a holographic grating keeps stray light to a minimum and offers excellent optical resolution. The use of a photo-multiplier tube as a detector offers exceptional sensitivity.

The T8DCS' true double beam optical system coupled with an efficient and well proven electronic control system ensures high stability and low background noise.

FEATURES & FUNCTIONS

- Photomultiplier tube detection provides exceptional sensitivity.
- Wavelength accuracy ±0.3nm (Automatic Wavelength Correction).
- User selectable spectral bandwidth between 0.1-5nm.
- User friendly design allows easy light source replacement and routine maintenance.
- Sample compartment design enables use of a wide range of optional accessories.
- UV-WIN software offers many operational and data processing capabilities and is supplied as standard with the T8DCS.

OPTICAL SYSTEM & COMPONENTS

The T8%$4 features an advanced continuous variable bandwidth feature making it the instrument of choice for applications with a demand for precise and accurate control of wavelength resolution. This feature allows the user to specify exactly what bandpass is required in the range of 0.1-5nm.

The double beam optical design combined with a high specification holographic grating gives excellent wavelength separation allowing the user to measure close adjacent wavelengths with excellent sensitivity.

The modular design of the sample compartment allows for ease of use of a wide range of optional accessories ensuring accurate analysis of various sample types including liquids, thin films and powders.

The user friendly design of the lamp compartment allows easy replacement and simplified routine maintenance of the Deuterium and Tungsten lamps.

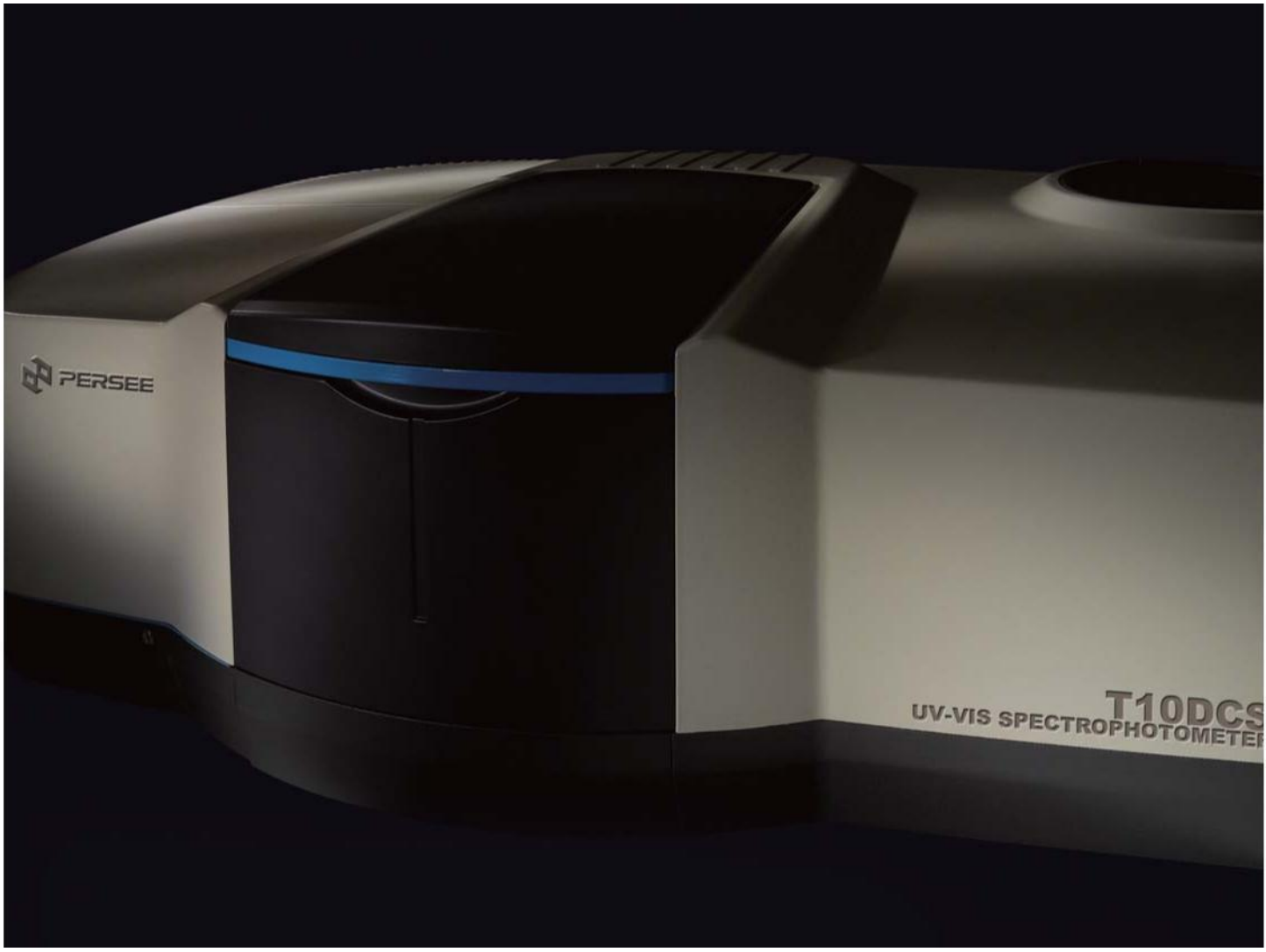
Specifications

Specifications	T8DCS
Optical System	Double beam
Scan Speed	Selectable
Wavelength Range	190 - 900nm
Wavelength Accuracy	± 0.3nm
Wavelength Reproducibility	≤ 0.1nm
Spectral Bandwidth	Continuous slit 0.1 - 5.0nm with 0.1nm interval
Photometric Mode	Transmittance, Absorbance, Energy Concentration, All Using UVWin Software
Photometric Range	-4.0 - 4.0Abs
Photometric Accuracy	0.002A (0 - 0.5A), 0.004A (0.5 - 1.0A), 0.3%T (0 -100%T)
Photometric Reproducibility	0.001A (0 - 0.5A)
Photometric Noise	0.0004A (500nm) 30min warm-up
Baseline Flatness	0.001A (200 - 850nm)
Baseline Stability	0.0008A/h (500nm, 0Abs), 2hr warm-up
Stray light	≤ 0.01 %T (220nm Nal, 340nm $NaNO_2$)
Standard Functionality	No stand alone function
Cell Holder	Fixed position sample and reference
Detector	Photo multiplier tube
Light Source	Tungsten Halogen and Deuterium arc lamps
Display	No display
Printer	Not available
PC Interface	RS232/USB
Software Support	UV Win
Power Supply	Switchable 120 - 230VAC 50 - 60Hz
Weight	43Kg
Dimensions (Width, Depth, Height)	545mm, 580mm, 270mm

Each Unit is supplied with the following as standard:

1 x Certificate of conformity
1 x Standard fixed position cell holder (sample and reference)
1 x Pair Quartz cells
1 x Black block for dark current correction
1 x UV Win Software disk
1 x Fuse (2A)
1 x Power cord
1 x Instruction manual
1 x Dust cover
1 x Packing list

T9DCS/T10DCS



TheT9DCS/T1ODCS Series Spectrophotometer incorporates dual monochromator technology making it well suited to even the most demanding of applications in all areas of UV-Visible Spectroscopy including:

- Pharmaceutical
- Metrological Verification
- Food Safety
- Material Science
- Biotechnology
- Research

Wireless instrument control and data acquisition can be achieved from a Tablet PC using Wi-Fi technology allowing the analyst to move freely around the laboratory whilst also keeping track of sample measurements.

The optical design of both the T9DCSand T10DCS offer extremely low stray light characteristics (δ0.00004%T NaI,220 nm) which allows for an extensive photometric range (-8.0 – 8.0Abs). Measurements at deep ultra-violet wavelengths can also be achieved with use of Nitrogen purged optics.

The instrument can be optically configured to suit the needs of the sample by means of a continually adjustable slit for precise control of spectral resolution and beam size adjustment by means of an attenuating wheel.

Precise wavelength accuracy is ensured by the integrated Mercury Emissions Lamp used for automatic correction of spectral deviation.

A whole host of specialised accessories are available to suit the specific requirement of the sample, these include:

- Both 60mm and 150mm Integrating Sphere for Diffuse reflectance measurements.
- Absolute, and Specula reflectance measurements accessories.
- Polarizing Optics.
- Thermostatic Cell Holders for temperature control.
- Various long and short pathlength cell holders.
- Automated cell changers for both sample and reference beams.
- Tablet dissolution accessory for pharmaceutical quality control.

Specifications

Further product information available soon.

Specifications	T9DCS	T10DCS
Optical System	Dual Monochromator Double Beam	Dual Monochromator Double Beam
Light Source	D2 Lamp – UV Region W Lamp – Visible Region Hg Lamp – Wavelength Correction	D2 Lamp – UV Region W Lamp – Visible Region Hg Lamp – Wavelength Correction
Wavelength Range	185---900nm	185---900nm
Wavelength Accuracy	±0.2nm	±0.2nm
Wavelength Reproducibility	≤0.1nm (D2 lamp)	≤0.1nm (D2 lamp)
Spectral Bandwidth	0.1 – 5nm Continually Adjustable	0.1 – 5nm Continually Adjustable
Stray Light	≤0.0001%T (NaI, 220 nm) ≤0.0001%T (NaNO2,360 nm)	≤0.00004%T (NaI,220 nm) ≤0.00002%T (NaNO2, 360 nm)
Photometric Range	-6.0Abs---6.0Abs	-8.0Abs---8.0Abs
Photometric Accuracy	±0.004A @2.0A ±0.003A @1.0A ±0.002A @0.5A ±0.3%	±0.004A @2.0A ±0.003A @1.0A ±0.002A @0.5A ±0.3%
Photometric Reproducibility	≤0.002A @2.0A ≤0.0008A @1.0A ≤0.0004A @0.5A ≤0.1%	≤0.002A @2.0A ≤0.0008A @1.0A ≤0.0004A @0.5A ≤0.1%
Baseline Flatness	±0.0008Abs	±0.0005Abs
Noise	0% Noise:δ0.01%; 100% T Noise:δ0.1%;	0% Noise:δ0.01%; 100% T Noise:δ0.1%;
Communication port	RS232C,USB, Wifi	RS232C,USB,Wifi

We reserve the right to modify, revise/upgrade, suspend or discontinue any Product in whole or in part, either temporarily or permanently, with or without notice.

UVWin

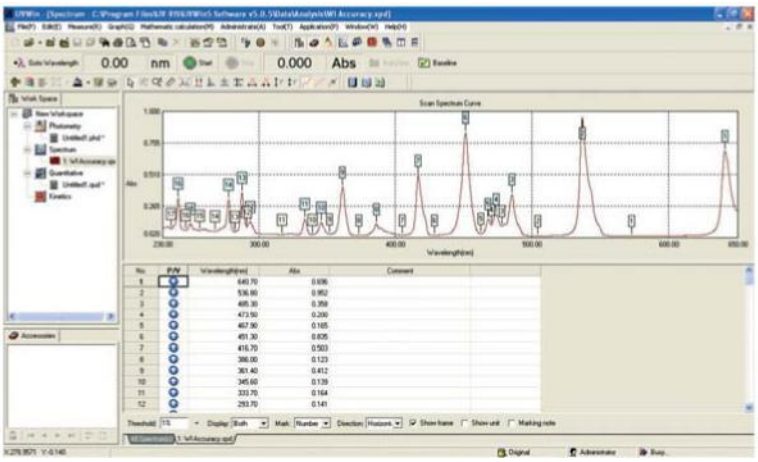
UVWin is a powerful, intuitive Software product used for connectivity to the range of bench top UV-Vis Spectrophotometers.

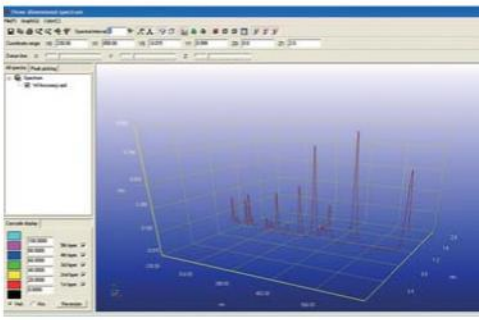
The UVWin software offers complete instrument control along with data acquisition and a whole host of mathematical tools for interpretation of measurement results. The UVWin software is separated into four key workspaces:

- Spectral Analysis
- Quantitative Analysis
- Kinetic Analysis
- Photometric Analysis

SPECTRUM WORKSPACE

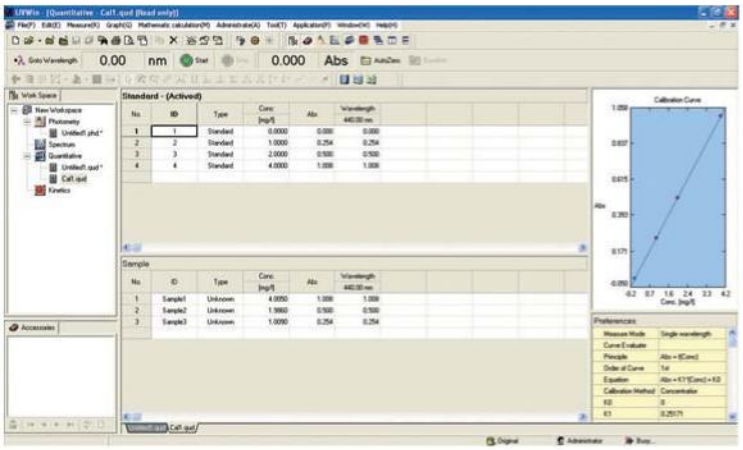
- Use the spectrum workspace to scan across a user-defined spectral range measuring in either absorbance or transmission.
- Use the "Peak Pick" tool to determine the wave-length at which peaks and valleys have occurred whilst also being able to determine their amplitude.
- View spectral overlay in the 3D display mode.
- Perform 1st, 2nd, 3rd and 4th order differentiation on sample scans for Derivative Spectroscopy.
- Export measurement data into Word, Excel, CSV and ASCII formats.
- Create method files for routine analysis whilst also being able to save measurement data.





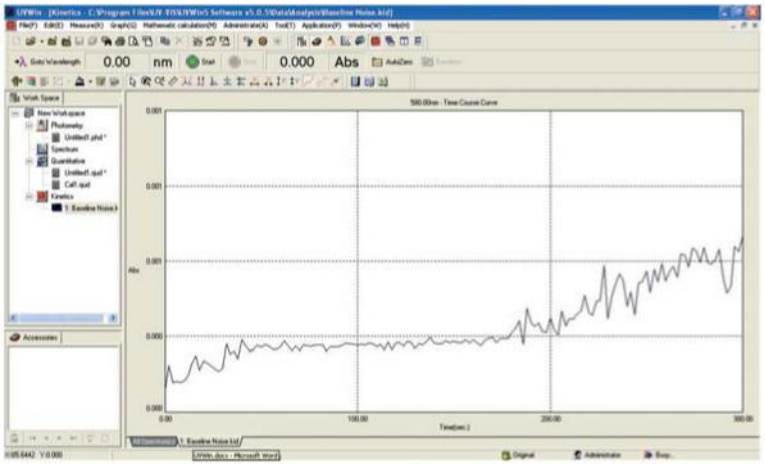
QUANTITATIVE WORKSPACE

- Use the Quantitative workspace to determine the concentration of unknown samples.
- Create a calibration curve using a series of standard solution or by directly entering the coefficients for the calibration curve equation.
- Specify 1st, 2nd, 3rd and 4th order correlation for the best calibration curve fit.
- Set Quality Control monitors to take user specified action in the event of measurement results falling outside user defined limits.
- Export measurement data into Word, Excel, CSV and ASCII formats.
- Create method files for routine analysis whilst also being able to save measurement data.



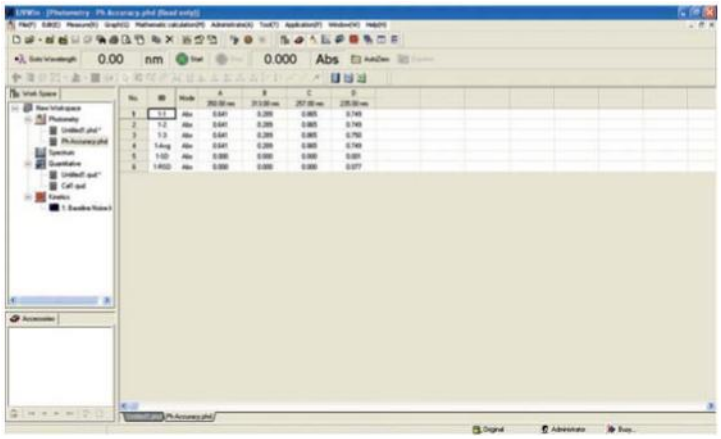
KINETIC WORKSPACE

- Monitor the change of Absorbance or Transmission as a function of time for Enzyme type reactions.
- Use in conjunction with a Flowcell for sample introduction or Peltier water circulator for temperature control.
- Specify data intervals and acquisition time for up to 24 hour reactions.
- Export measurement data into Word, Excel, CSV and ASCII formats.
- Create method files for routine analysis whilst also being able to save measurement data.



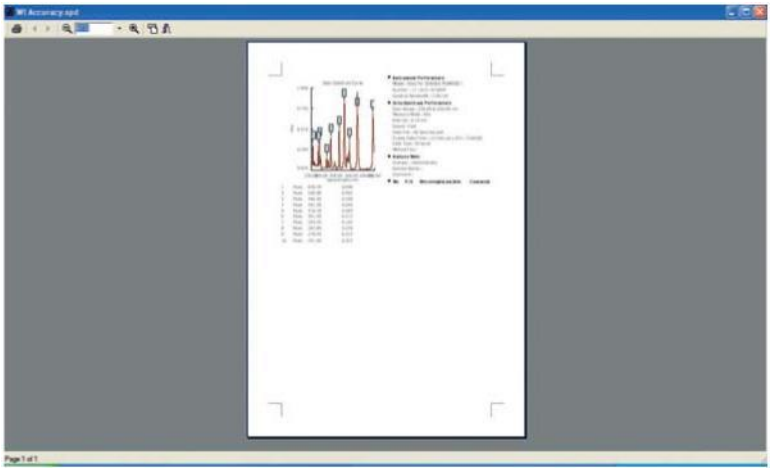
PHOTOMETRIC WORKSPACE

- Perform a series of sequential fixed wavelength measurements in either Absorbance or Transmission.
- Automate sample measurements by configuring the instrument cell changer.
- Calculate concentration of unknown samples quickly using the "Simple Calculation" option where complete calibration is not required.
- Automatically calculate statistics like standard deviation, relative standard deviation, and averages.
- Export measurement data into Word, Excel, CSV and ASCII formats.
- Create method files for routine analysis whilst also being able to save measurement data.



REPORTING

- Produce reports for photometric, spectrum, kinetic and quantitative measurement data.
- Include or remove spectra, calibration curves along with samples measurement tables.

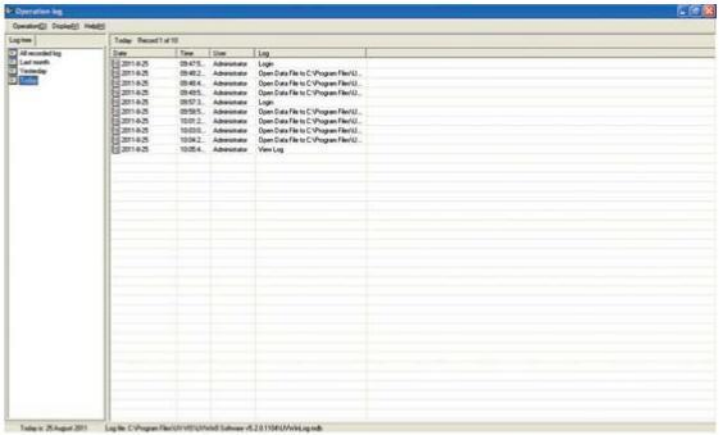


UVWinGLP

UVWin GLP offers all of the features and functionality of UVWin whilst also offering extensive Administrative capabilities along with a detailed audit trail.

ADMINISTRATION

- Administrative settings can be made where Analysts may require conformity to GLP/GMP/GRP.
- Create User groups specifying exactly what actions they are able to perform.
- Add New Users to custom User Groups to determine their privilege settings.
- Automatically log software activity in an Audit Trail.
- Use Password control to ensure Users are logged in for instrument usage.



CERTIFICATION

UVWin GLP has been evaluated and tested by a third party software validation specialist. As a result it was found that UVWin GLP offers all of the features and functions required for use in compliance with the guidance specified in:

- 21CFR Part 11- Electronic Records; Electronic Signatures
- Guidance for Industry Part 11, Electronic Records; Electronic Signatures — Scope and Application, August 2003

T3/T3M continued

PORTABLE SPECTROMETER

The T3 Portable Spectrometer is a compact portable instrument based on advanced CCD detection technology. Whilst being highly compact the instrument boasts all of the features of a conventional bench-top Spectrophotometer including Spectrum Scanning, Photometric, Quantitative and Kinetic Methods.

A Windows CE embedded operating system and touch screen TFT interface allow for ease of use and extensive data storage. Field measurement data can be transferred from internal instrument storage to a PC via USB connection and the T3 Data Viewer Software which offers an extensive tool set for data interpretation and reporting. The T3 Spectrometer is supplied with a rugged carry case and a wide range of accessories suited to your sampling requirements.

The T3M differentiates itself from the standard T3 by means of pre-programmed test methods for the Spectroquant® series of reagent test kits from Merck Chemicals.

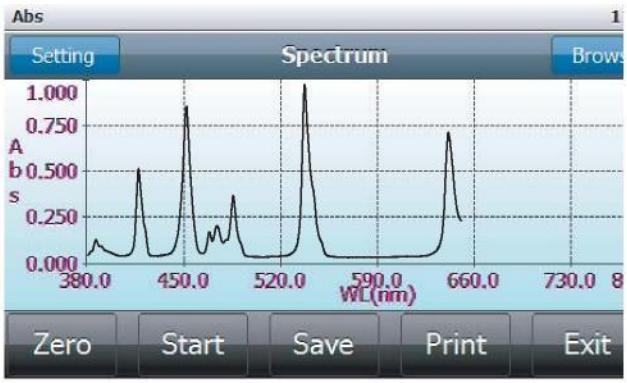
Persee Analytics have selected the Spectroquant® Test Kits from Merck Chemicals as a partner in order to offer an application specific instrument, targeted specifically for environmental measurements. The T3M Spectrometer is supplied pre-programmed with calibration data for each of the Spectroquant® test methods.

Spectroquant® test kits can offer an analytical solution for the following parameters by means of 130 different test kits:

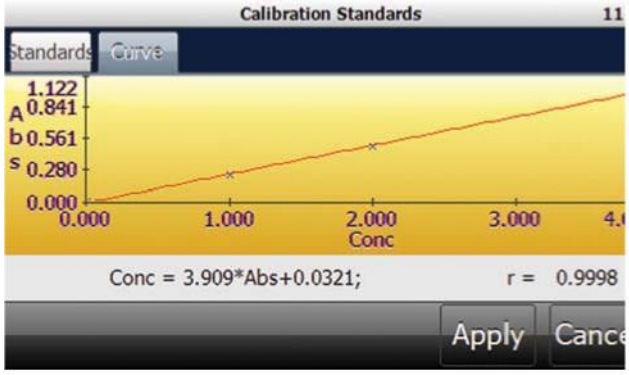
- Drinking water
- Surface water
- Process water
- Municipal or industrial wastewater
- Beverages
- Disinfectant control

Note: Spectroquant is a registered trademark of Merck Chemicals, Germany.

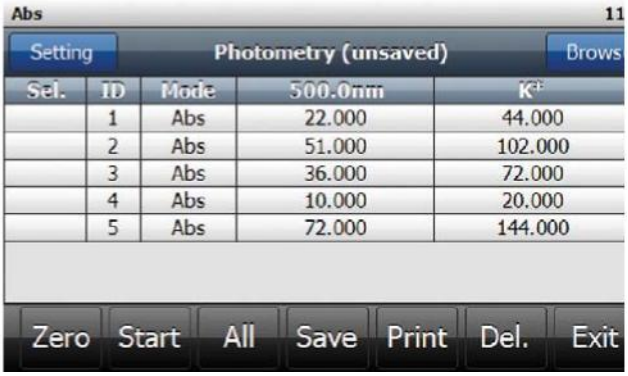
Windows CE Based Operating System with 320 x 240 touch screen TFT Interface.



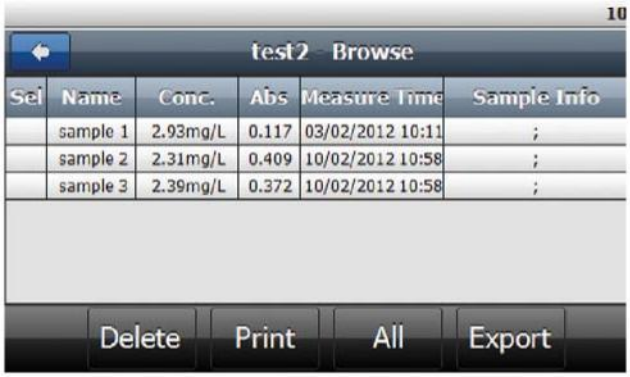
The Spectrum workspace allows high speed spectral scanning, with zoom and peak identification tools. Spectral Scans can be performed in the field, stored to instrument memory and later transferred to the

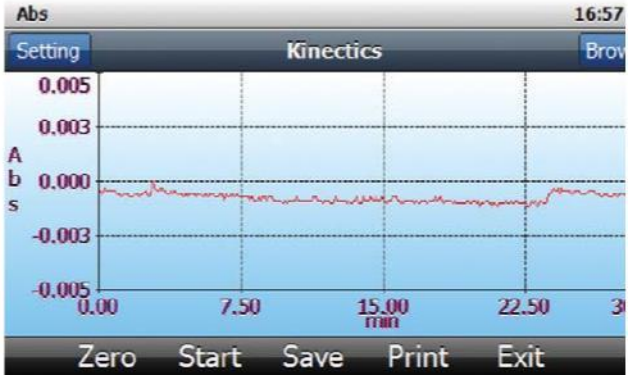


curves, and measure concentration of unknown samples. Curves can be constructed in 1st – 4th order, whilst both methods and measurement data can be saved to instrument memory.



Use the Photometric workspace to quickly and easily



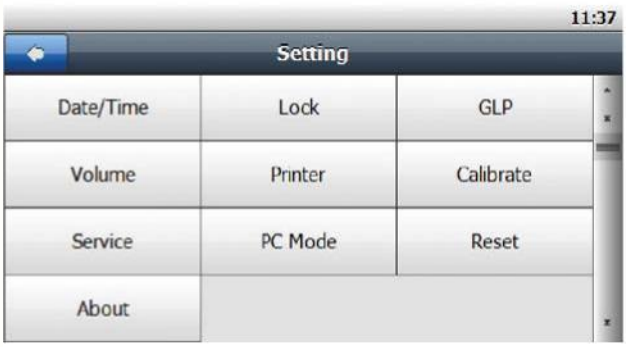


Absorbance or Transmission. Set a K factor where multiplications are required to determine sample concentration. Once the measurement is complete store to instrument memory for future recall.
The Kinetic workspace enables the measurement of Absorbance or Transmission as a function of time. Use the zoom and peak pick features to obtain a better view of the Kinetic curve. Measurement data can be saved and recalled at any time.

T3/T3M

User and admin rights are easily controlled from the GLP feature in the settings menu. Create user groups and specify their privilege level then add new users to a specified group.

Use the universal cell holder to measure various pathlength rectangular cells and rounds test tubes accommodating all of your sampling requirements.



Control instrument configuration from the settings menu.

Use the fibre dip probe for in-situ sample measurements.

Once all of the required field analysis has been performed and measurement data stored to instrument memory the Spectrometer can be connected to the T3 Data Viewer Software via USB for transfer of analysis data from all of the instrument workspaces. Use the Data Viewer Software to further interpret analysis results, export data into a wide variety of formats and produce analysis reports for storage or printing.

Specifications

Light Source	Convergent tungsten lamp with 7000hr lifespan.	
Measurement Workspaces	Spectrum Quantitative Kinetics Photometric	
Optical System	Polychromatic with concave holographic grating	
Detector	CCD Sony ILX511 2048 Pixels	
Sampling Accessories	Fibre Dip Probe with 10mm and 20mm pathlength tips (optical accessory) Rectangular Cuvette Holder Cylindrical Test Tube Holder	
Power supply	Built-in re-chargeable battery with 5 hr usage	
Printer	Micro printer (optional)	
Operating system	Windows Embedded CE 6.0 with 2GB Flash Memory	
Input/display	320 x 240 True Colour TFT Touch Screen	
Specifications	Wavelength range Wavelength resolution Spectral bandwidth Wavelength accuracy Wavelength repeatability Baseline flatness Noise Drift Stray light Photometric accuracy Photometric repeatability	380nm – 800nm 0.4nm 4±0.8nm ±1.0 nm ~ 0.1nm ±0.005Abs 0.5% 1.0% 0.5% ±1.0% 0.3%
Dimension	280 x 170 x 110mm	
Environmental temperature	Operating environment 5-30˚C Storage environment -20-55˚C	

Specifications

T6U (UV-Visible)		T6V (Visible)	T7
Optical System	Split beam ratio	Split beam ratio	Split beam ratio
Scan Speed	Selectable	Selectable	Selectable
Wavelength Range	190 -1100nm	325 -1100nm	190 -1100nm
Wavelength Accuracy	± 1nm	± 2nm	± 0.3nm
Wavelength Reproducibility	< 0.2nm	< 0.4nm	< 0.2nm
Spectral Bandwidth	2nm	2nm	2nm
Photometric Mode	Transmittance, Absorbance, Energy	Transmittance, Absorbance, Concentration	Transmittance, Absorbance, Energy and Concentration
Photometric Range	-0.3 - 3.0Abs	-0.3 - 3.0Abs	-0.3 - 3.0Abs
Photometric Accuracy	0.002A (0 - 0.5A), 0.004A (0.5 -1.0A), 0.3%T (0 -100%T)	0.002A (0 - 0.5A), 0.004A (0.5 -1.0A), 0.3%T (0 -100%T)	0.002A (0 - 0.5A), 0.004A (0.5 -1.0A), 0.3%T (0 -100%T)
Photometric Reproducibility	0.001A (0 - 0.5A), 0.002A (0.5 - 1.0A), 0.15%T (0 -100%T)	0.001A (0 - 0.5A), 0.002A (0.5 -1.0A), 0.15%T (0 -100%T)	0.001A (0 - 0.5A), 0.002A (0.5 - 1.0A), 0.15%T (0 -100%T)
Photometric Noise	0.001A (500nm) 30min warm-up	0.002A (500nm) 30min warm-up	0.001A (500nm) 30min warm-up
Baseline Flatness	0.002A (200 -1000nm)	0.002A (325 -1000nm)	0.002A (200 -1000nm)
Baseline Stability	0.001A/h (500nm, 0Abs), 2hr warm-up	0.002A (500nm, 0Abs), 2hr warm-up	0.001A/h (500nm, 0Abs), 2hr warm-up
Stray light	< 0.05%T (220nm Nal, 340nm $NaNO_2$)	< 1.0%T (340nm $NaNO_2$)	< 0.12%T (220nm Nal, 340nm $NaNO_2$)
Integration Time	N/A	N/A	N/A
Standard Functionality	Photometric Measurement. (Quantitative, Multi-wavelength, Spectrum and Kinetic measurements with	Photometric and Quantitative measurements.	Photometric, Quantitative, Spectrum and DNA measurements.
Cell Holder	Automatic 8 Cell Changer	Automatic 8 Cell Changer	Automatic 8 Cell changer
Detector	Silicon photo diode	Silicon photo diode	Silicon photo diode
Light Source	Tungsten Halogen and Deuterium arc lamps	Tungsten Halogen lamps	Tungsten Halogen and Deuterium arc lamps
Display	Digital LCD display	Digital LCD display	Digital LCD display
Printer	Mini printer	Mini printer	N/A
PC Interface	RS232	RS232	RS232/USB
Software Support	Local and UV Win	Local and UV Win	Local and UV Win
Power Supply	Switch mode 95 - 250VAC 50 - 60Hz	Switch mode 95 - 250VAC 50 - 60Hz	Switchable 120 – 230VAC 5 60Hz
Weight	11Kg	11Kg	25Kg
Dimensions (Width, Depth, Height)	476mm, 362mm, 225mm	476mm, 362mm, 225mm	520mm, 420mm, 230mm

T7S	T7D	T7DS	T8DCS
Split beam ratio	Double beam	Double beam	Double beam
Selectable	Selectable	Selectable	Selectable
190 -1100nm	190 -1100nm	190 -1100nm	190 - 900nm
± 0.3nm	± 0.3nm	± 0.3nm	± 0.3nm
< 0.2nm	< 0.2nm	< 0.2nm	< 0.1nm
0.5, 1.0, 2.0, 5.0nm	2nm	0.5, 1.0, 2.0, 5.0nm	Continuous slit 0.1 - 5.0nm (0.1nm interval)
Transmittance, Absorbance, Energy and Concentration	Transmittance, Absorbance, Energy and Concentration	Transmittance, Absorbance, Energy and Concentration	Transmittance, Absorbance, Energy and Concentration
-0.3 - 3.0Abs	-0.3 - 3.0Abs	-0.3 - 3.0Abs	-4.0 - 4.0Abs
0.002A (0 - 0.5A), 0.004A (0.5 -1.0A), 0.3%T (0 -100%T)	0.002A (0 - 0.5A), 0.004A (0.5 - 1.0A), 0.3%T (0 -100%T)	0.002A (0 - 0.5A), 0.004A (0.5 -1.0A), 0.3%T (0 -100%T)	0.002A (0 - 0.5A), 0.004A (0.5 - 1.0A), 0.3%T (0 - 100%T)
0.001A (0 - 0.5A), 0.002A (0.5 - 1.0A), 0.15%T (0 -100%T)	0.001A (0 - 0.5A), 0.002A (0.5 -1.0A), 0.15%T (0 -100%T)	0.001A (0 - 0.5A), 0.002A (0.5 -1.0A), 0.15%T (0 -100%T)	0.001A (0 - 0.5A)
0.001A (500nm) 30min warm-up	0.001A (500nm) 30min warm-up	0.001A (500nm) 30min warm-up	0.0004A (500nm) 30min warm-up
0.002A (200 – 1000nm)	0.0015A (200 -1000nm)	0.0015A (200-1000nm)	0.001A (200 - 850nm)
0.001A/h (500nm, 0Abs), 2hr warm-up	0.0008A/h (500nm, 0Abs), 2hr warm-up	0.0008A/h (500nm, 0Abs), 2hr warm-up	0.0008A/h (500nm, 0Abs), 2hr warm-up
< 0.12%T (220nm Nal, 340nm $NaNO_2$)	< 0.12%T (220nm Nal, 340nm $NaNO_2$)	< 0.12%T (220nm Nal, 340nm $NaNO_2$)	< 0.01%T (220nm Nal, 340nm $NaNO_2$)
N/A	N/A	N/A	N/A
Photometric, Quantitative, Spectrum and DNA measurements.	Photometric, Quantitative, Spectrum and DNA measurements.	Photometric, Quantitative, Spectrum and DNA measurements.	No stand alone function
Automatic 8 cell changer	Automatic 8 Cell changer	Automatic 8 cell changer	Fixed position sample and reference
Silicon photo diode	Silicon photo diode	Silicon photo diode	Photo multiplier tube
Tungsten Halogen and Deuterium arc lamps	Tungsten Halogen and Deuterium arc lamps	Tungsten Halogen and Deuterium arc lamps	Tungsten Halogen and Deuterium arc lamps
Digital LCD display	Digital LCD display	Digital LCD display	No display
N/A	N/A	N/A	N/A
RS232/USB	RS232/USB	RS232/USB	RS232/USB
Local and UV Win	Local and UV Win	Local and UV Win	UV Win
Switchable 120 – 230VAC 50 – 60Hz	Switchable 120 - 230VAC 50 - 60Hz	Switchable 120 - 230VAC 50 - 60Hz	Switchable 120 - 230VAC 50 - 60Hz
25Kg	25Kg	25Kg	43Kg
520mm, 420mm, 230mm	520mm, 420mm, 230mm	520mm, 420mm, 230mm	545mm, 580mm, 270mm

Specifications

Model	T9DCS	T1ODCS	T3/T3M
Optical System	Double beam	Double beam	Polychromatic with concave holographic grating
Scan Speed	1000nm/min 1500nm/min location speed speed	1000nm/min 1500nm/min location	-
Wavelength Range	185-900nm	185-900nm	380-800nm
Wavelength Accuracy	±0.2nm	±0.2nm	± 1.0nm
Spectral Bandwidth	±20%(0.1nm–5nm continuously selectable)	±20%(0.1nm–5nm continuously selectable)	4nm ± 0.8nm
[illegible]	Transmittance, Absorbance, [illegible]	Transmittance, Concentration	Transmittance, Energy and Concentration
Photometric Range	-6.0Abs-6.0Abs	-8.0Abs-8.0Abs	-
Photometric Accuracy	±0.004A @2.0 A ±0.003A @1.0 A ±0.002A @0.5 A ±0.3%	±0.004A @2.0 A ±0.003A @1.0 A ±0.002A @0.5 A ±0.3%	± 1.0%
Photometric Reproducibility	<0.002A @2.0 A <0.0008A / 1.0 A <0.0004A/ 0.5 A <0.1%	<0.002A @2.0 A <0.0008A / 1.0 A <0.0004A/ 0.5 A <0.1%	≤ 0.3%
Photometric Noise	0% Noise:<0.01% 100% Noise:<0.1%	0% Noise:<0.01% 100% Noise:<0.1%	-
Baseline Flatness	±0.0008Abs	±0.0005Abs	± 0.005Abs
Baseline Stability	0.1%/hr	0.1%/hr	-
Stray light	<0.0001%T (NaI, 220 nm) <0.0001%T ($NaNO_3$,360 nm)	<0.00004%T (NaI,220 nm) <0.00002%T ($NaNO_3$, 360 nm)	≤ 0.5%
Integration Time	N/A	N/A	-
Standard Functionality			Spectrum, Quantitative, Kinetics, Photometric
Cell Holder	Automatic 8 Cell Changer	Automatic 8 Cell Changer	-
Detector	Photo multiplier tube	Photo multiplier tube	CCD Sony ILX511 2048 Pixels
Light Source	D2 lamp, Tungsten lamp, Mercury lamp for WL correction.	D2 lamp and Tungsten lamp. Mercury lamp for WL correction.	Convergent tungsten lamp with 7000hr lifespan
Display	N/A	N/A	320 x 240 True Colour TFT Touch Screen
Printer	N/A	N/A	Micro printer (optional)
Pc Interface	RS232C,USB , Wifi	RS232C,USB ,Wifi	-
Software Support	UV Win	UV Win	-
Power Supply	Switchable 120-230VAC 50-60Hz	Switchable 120-230VAC 50-60Hz	Built-in re-chargeable battery with 5 hr usage
Weight	62Kg	62Kg	-
Dimensions (width, depth, height)	913mm, 645mm, 298mm	913mm, 645mm, 298mm	280mm, 170mm, 110mm

Accessories

I 6

Available Program cards include:

- Quantitative card 21602-2801-00
- Spectrum scanning/Kinetics card 21604-2801-00
- Multi wavelength card 21605-2801-00
- Palm Oil Analysis Card (DOBI)

CH16-1
Constant temperature cell holder

- Cell Pathlength: 10mm
- Number of Cells: 5
- Requires PTC-2 Peltier Water Circulator

PS16-2
Sipper Pump

- Pump Speed: 0.1 - 250 RPM
- Speed resolution: 0.1 RPM less than 30 RPM Speed and 1 RPM above 30 RPM Speed

DS16-1
Angle adjustable sample holder

- Maximum angle: 45 Degrees
- Minimum Sample Size: 4mm (Width)
- Maximum Sample Size: 80 x 55 x 5mm

PTC-2
Peltier

- Temperature range: 5 - 75°C
- Use in conjunction with CH16-1

TR16-1
Test tube holder

- Test Tube Diameter: 15 - 25mm
- Test Tube Height: 90 - 120mm

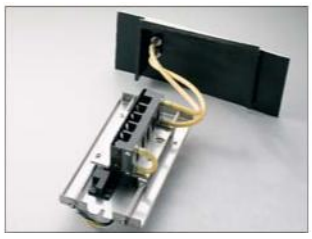
USB Printer driver P2U

- Connect the T60 to specific USB printers

T7

LS181-1
5 cell holder

- Cell Pathlength: 5 - 50mm (adjustable)
- Number of Cells: 5

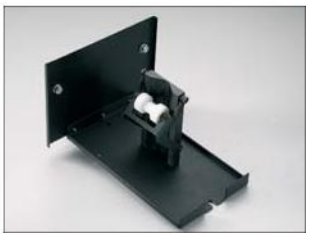


CH181-1
Constant temperature sample holder

- Cell Pathlength: 10mm
- Number of Cells: 5
- Requires PTC-2 Peltier Water Circulator

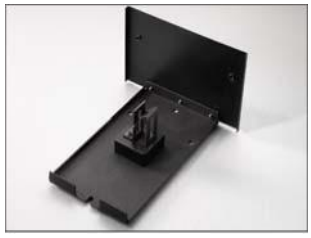
DS181-1
Angle adjustable holder

- Maximum angle: 45 Degrees
- Minimum Sample Size: 4mm (Width)
- Maximum Sample Size: 80x55xmm



TR181-1
Test tube holder

- Test Tube Diameter: 15 - 25mm
- Test Tube Height: 90 -120mm



S181-1
Solid Sample Holder

- Maximum sample size: 80mm x 55mm x 5mm

8F offer a complete range of cuvettes

T7 continued

MR181-1
Specular Reflection
- Incidence angle: 5°
- Size of Sample Area Measured: 11 × 9mm to 60 × 40mm
- Spectral Range: 200 - 1100nm

PS181-2
Sipper Pump
- Pump Speed: 0.1 - 250 RPM
- Speed resolution: 0.1 RPM less than 30 RPM Speed and 1 RPM above 30 RPM Speed

MH181-1
Micro cell holder
- Pathlength: 10mm
- Minimum Cell Window Width: 2mm
- Minimum Cell Window Height: 10mm

PTC-2
Peltier
- Temperature range: 5 - 75°C
- Use in conjunction with CH181-1

T7D

LS188-1
5 cell holder
- Cell Pathlength: 5-50mm (adjustable)
- Number of Cells: 5

CH188-1
Constant temperature holder
- Cell Pathlength: 10mm
- Number of Cells: 2 Cells (one for Sample and one for Reference)
- Requires PTC-2 Peltier Water Circulator

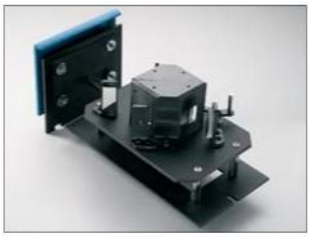
PS181-2
Sipper Pump
- Pump Speed: 0.1 - 250 RPM
- Speed resolution: 0.1 RPM less than 30 RPM Speed and 1 RPM above 30 RPM Speed

PTC-2
Peltier
- Temperature range: 5 - 75°C
- Use in conjunction with CH188-1

T8DCS

CH92
Constant temperature holder
- Cell Pathlength: 10mm
- Number of Cells: 2 Cells (one for Sample and one for Reference)
- Requires PTC-2 Peltier Water Circulator

S19-1
Solid Sample Holder
- Maximum Sample Size: 80mm × 55mm x 5mm
- Sample and reference beams



IS92
Integrating Sphere
- Incidence angle: Sample 0° reference 8°
- Minimum Sample Size for Diffuse Reflectance: 15mm × 25mm
- Minimum Sample Size for Transmission: 20mm Diameter
- Wavelength Range: 230-850nm with a 5nm Bandpass
- Sphere Diameter: 58mm

DS19-1
Angle adjustable cell holder
- Maximum angle: 45 Degrees
- Minimum Sample Size: 4mm (Width)
- Maximum Sample Size: 80 x 55 x 5mm

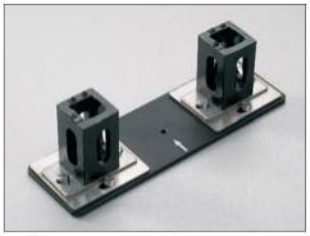
8F offer a complete range of cuvettes

T8%$4 continued

TR19-1
Test tube holder
- Test Tube Diameter: 15 - 25mm
- Test Tube Height: 90 - 120mm

MR19-1
Specular reflection
- Incidence angle: 5°
- Size of Sample Area Measured: 30 x 15mm
- Spectral Range: 200 - 900nm

LS19-1
Long path-length holder
- Pathlength: 5, 10, 20, 30, 40, 50, 100mm
- Number of Cells: 2 Cells (one for Sample and one for Reference)

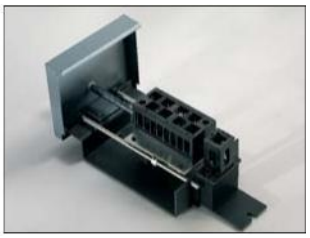


MH19-1
Micro cell holder
- Pathlength: 10mm
- Minimum Cell Window Width: 2mm
- Minimum Cell Window Height: 10mm

MH19-2
Ultra micro cell holder
- Pathlength: 10mm
- Minimum Cell Window Width: 2mm
- Minimum Cell Window Height: 5mm

PS92
Sipper Pump
- Pump Speed: 0.1 - 250 RPM
- Speed resolution: 0.1 RPM less than 30 RPM Speed and 1 RPM above 30 RPM Speed

PTC-2
Peltier
- Temperature range: 5 - 75°C
- Use in conjunction with CH19-1

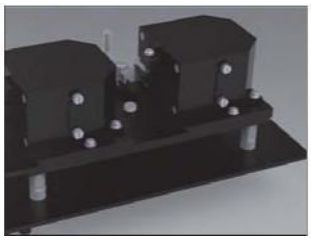


AS91
8 Cell Changer
- 8 position cell changer
- Pathlength: 10mm

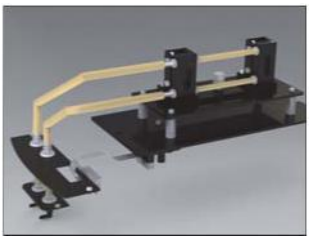
T9DCS/T10DCS

Double beam 60mm Integration sphere

Double beam 150mm integration sphere



Double beam relatively specular reflection accessories



Double beam thermostatic cell holder

Double beam test tube holder

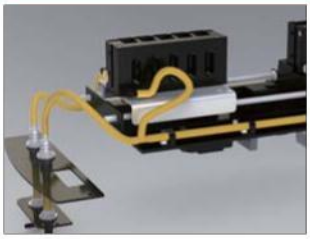
Double beam micro cell holder

Adjustable solid sample holder

Double beam sipper pump accessories

8F offer a complete range of cuvettes

T9DCS/T10DCS continued



Double beam 5-cell thermostatic holder

Double beam 50mm long path length 5-cell holder

Double beam 100mm long path length cell holder

Double beam dissolution accessories

Double beam 8-cell changer

13/13M

30-010
Fibre Dip Probe

- 10mm and 20mm pathlength tips

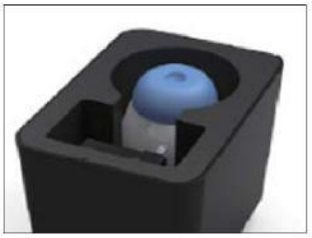
Crushing module

Measurement module

Ultrasonic module

Temperature control module

Distillation module



Vortex module

Food Sample Extraction module

Centrifuge module

Arsenic hydride measurement module

Hydrogen sulfide measurement module

Titration module

We offer a complete range of cuvettes

T3113M continued

Honey moisture analysis module

Module Package

Conductivity measurement module

Water quality analysis module

Soil sampling module

Universal module for soil and fertilizer analysis

Available boron analysis module

Basic module

Stirring module

Filtration module

Soil Sample Extraction module

Heating extraction module

-I6 test tube module

-25 test tube module

Constant volume module

Condensation module

Consumables

D2 lamp D2-100 (T60U)

D2 lamp D2-200 (T70, T80, T90, T92)

W lamp W-100 (T60V, T60U)
W lamp W-200 (T70, T80, T90, T92)

Glass and Quartz cuvettes

We offer a complete range of cuvettes

A3

The A3 Atomic Absorption Spectrometer is a high performance automated instrument designed to meet the requirements of the modern laboratory. Due to its versatility and performance it can be used for a wide range of applications including:

- Agricultural
- Clinical
- Environmental
- Food
- Metal
- Mining
- Geological
- Petrochemical
- Pharmaceutical

The versatile instrument is available in three configurations:

A3F – The instrument is equipped with a flame atomiser only. The positioning of which is fully controlled by the embedded computer system and AA Win software.

Three flame options are available to the user with the Air/Acetylene being the standard configuration. This flame can be used for nearly all standard elements while the N2O/Acetylene and the Air/LPG (Natural gas) are available as an option for the more demanding of elements. All three flame configurations offer coded burner for full safety protection.

A3G – The instrument is equipped with a Graphite Furnace Atomiser only. The graphite head is fixed into the optical path to maximise performance and eliminate drift.

The temperature of the transversely heated graphite tube is accurately controlled by means of a precision feedback system. Pyrolytically coated platform tubes are supplied as standard to improve the performance and eliminate many analytical problems associated with this technique.

A3FG – The instrument is equipped with both Flame Atomiser and Graphite Atomiser as described above. Both configurations are installed into the instrument and can be changed over by a simple selection in the versatile AA Win software.

FEATURES & FUNCTIONS

- Embedded PC system built into the instrument as standard on all configurations. Pre-installed AAWin3 software, user manuals, cook book and Windows operating system.
- AAWin3 software provides full control of the instrument and autosampler with easy method change for each technique. **Now GLP compliant.**
- Automatic 8 Hollow Cathode lamp turret controlled and optimised by the AAWin3 software. Operating lamp current and warm-up lamp current can be individually controlled to eliminate drift commonly associated with lamp warming.
- D2 lamp background correction system fitted as standard to all configurations. High energy D2 lamp and adjustable beam splitter mirror are optimised by the AAWin3 software.
- Self Reversal background correction system fitted as standard to all configurations. The high performance background system uses the same hollow cathode lamp as installed for the analysis. Minimum extra components are required and optical alignment is very simple. Self Reversal can be used for any element at any wavelength making it extremely versatile.
- High precision minimal optics ensures maximum light throughput to the computer controlled Czerny-Turner monochromator.
- A universal autosampler is available as an optional accessory which is conveniently mounted on the front of the A3 instrument.
- Optional XYZ autosampler provides high sample volume for multi element analysis along with scalable sample capacity for high ample throughput.
- Absorption and Emission modes are standard features in the AAWin3 software as well as peak height, peak area, sequential and manual integration modes.

FLAME ATOMISER FEATURES

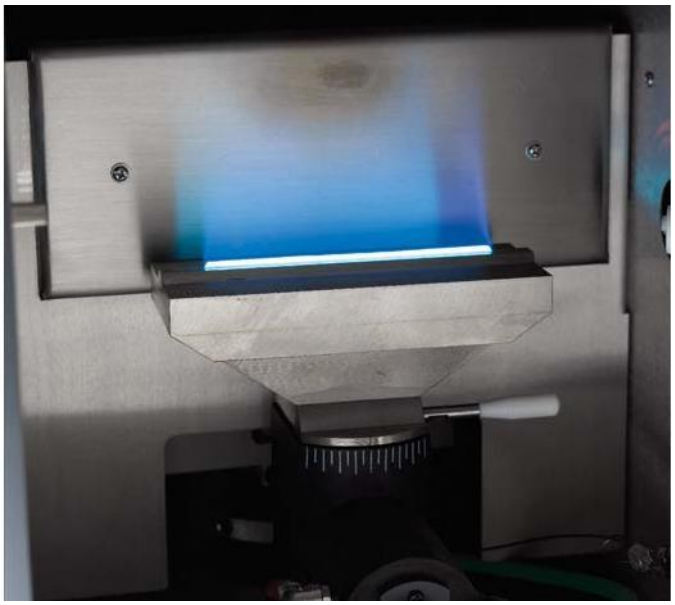
The flame atomiser offers three flame options: Air/acetylene is the standard configuration with the N2O/acetylene and Air/LPG as options.

Air/Acetylene

- The Air/Acetylene flame uses a 100mm single slot burner for the standard configuration.
- The high sensitivity (Cu 2ppm >0.280abs) is due to the efficiency of the fixed position glass nebuliser fitted as standard. An acid resistant replacement is available as an option.
- The flame can be easily set from blue lean flame through stoichiometric to fuel rich by means of computer control.

N20/Acetylene

- The N_2O/Acetylene flame uses a 50mm single slot burner and is available as an optional extra.
- This flame configuration is used to measure elements less prone to ionization such as: Aluminium, Tin, Titanium, Calcium, Vanadium and Molybdenum.
- Switching from Air/Acetylene to N_2O/Acetylene to Flame Off is fully controlled by the AAWinPro software.



A3 continued

Air/Propane (LPG)

- This flame uses a 3 slot burner and with the low pressure requirement it is also much safer to operate.
- Due to the low temperature of the flame it is ideal for analysing alkali metals such as: Potassium, Sodium and Lithium, especially when used in the emission mode.
- Some remote areas of the world have difficulty obtaining Acetylene gas of a high enough purity to operate the flame correctly, LPG can give a real alternative and offer comparable results for most elements throughout the wavelength range.

Safety Features

- Pressure monitoring for all gases
- Burner Identification
- Flame sensor
- Drain Trap level Sensor
- Gas Leak Detector
- Over Pressure in Premix
- Safety Cut off Switch

GRAPHITE ATOMISER FEATURES

The integrated Graphite Furnace Atomiser is available in two instrument configurations.

- In the A3G instrument the graphite furnace head is fixed into the light path so alignment with the optical path is simple and accurate.
- In the A3FG instrument the graphite furnace head is fixed behind the flame atomiser assembly and is motorised into position by a simple operation in the AAWinPro software. The positions for the flame and graphite are saved making it easy to swap between modes for different analysis.
- The temperature of the transversely heated graphite tube is accurately controlled by means of a precision feedback system and has been designed to reduce analytical problems normally associated with this type of technique.
- Pyrolytically coated graphite tubes are used as standard and are manufactured to improve performance as well as increase the analytical life.
- Platform graphite tubes are supplied as standard and will accept volumes up to 20µl. Non-platform graphite tubes are also available as an optional extra.
- Up to 10 heat stages are available for the programming of the graphite atomiser. These can be set and stored within the AAWinPro software.
- The graphite tube is held in position by means of a gas piston. Replacement of the graphite tube is performed by a simple command in the AAWin Software.
- The graphite tube is efficiently cooled by an additional water circulation system (supplied separately).

Safety Features

- Argon Gas pressure Sensor
- Water flow sensor
- Over Temperature Sensor
- Broken graphite tube protectionBoth configurations are installed into the instrument and can be changed over by a simple selection in the versatile AA-Win software.

Specifications

Wavelength Range	185nm-910nm
Monochromator	Czerny-Turner Configuration
Spectral Bandwidth	0.1nm, 0.2nm, 0.4nm, 1.0nm, 2.0nm, (software selectable).
Wavelength Accuracy	± 0.15nm
Wavelength Reproducibility	< 0.05nm
Resolution	0.2nm ± 0.02nm
Baseline Stability	0.005A/30min
Sensitivity (Cu)	2 µg/ml Absorption > 0.28A (flame)
Detection Limit	Cu < 0.004 µg/ml (flame) Cd < 0.4 x 10^{-12}g (graphite furnace)
Repeatability	Cu < 0.7% (Air/Acetylene flame) Ba < 1.0% (Nitrous oxide/Acetylene flame) Cu < 2.0% Cd < 2.0% (Graphite Furnace)
Background Correction	Deuterium Arc, Self reversal
Characteristic Concentration	Cu < 0.02 µg/ml, Ba < 0.15 mg/ml (N2O/Acetylene)
Burner Heads	Titanium Alloy
Nebuliser	Inert Adjustable Nebuliser, Flow Rate from 2ml-6ml/min. Pt/Ir capillary available for high acid concentration
Atomization Chamber	Corrosion-resistant material
Position Adjustment	Automatic changeover (A3F() Manual (A3F) Automatic Setting of Optimum Height for Flame Burner.
Safety Functions	Burner Identification, Flame Sensor, Gas leak Sensor, Low Gas Pressure Sensor, Drain Trap Sensor, Power Loss Protection, Circulation Water (graphite), Over Temperature Sensor (graphite)

We reserve the right to modify, revise/upgrade, suspend or discontinue any Product in whole or in part, either temporarily or permanently, with or without notice.

PF7

The automated PF7 is an ideal instrument for elemental analysis in various market and research industries including:

- Agricultural
- Pharmaceutical
- Food and beverage
- Geological
- Public health
- Metallurgical
- Clinical
- Petrochemical

Standard Features

Light source

- High intensity hollow cathode lamps for improved sensitivity and stability.
- Pre-aligned lamp assemblies for trouble free installation.
- All lamps are uniquely data coded offering important information to the PF Win operating software.
- Up to 3 lamps can be installed for simultaneous analysis.

Optical System

- Double beam optical system to eliminate drift from the light source and the detector.
- Shielded optical design greatly reducing light interference.
- Enhanced signal to noise ratio for increased analytical sensitivity.
- Unique optical configuration for increased Fluorescence intensity. Up to twice the intensity found in traditional AFS systems.
- High Quantum Solar Blind detector fitted as standard to ensure optimum stability.

Atomiser System

- High precision quartz tube designed for optimum performance, durability and long life.
- Adjustable height control for improved optimisation.
- Integrated 2 stage, fully sealed, fume exhaust system to decontaminate toxic elements and pollution.
- Gold Mesh fitted to the chimney removes any mercury pollutant.

Hydride Generator

- Integrated continuous flow Hydride System.
- Gas pressure sampling offers maintenance free operation.
- Online auto dilution and multiple auto purge by gas driven sequential injection system.
- Fully sealed reservoir bottles for extended solution life.
- New design Gas Liquid Separator with magnetic stirring for improved repeatability of analytical results.
- Liquid Separator cooled directly by specially designed Peltier system to remove unwanted water in the formed hydride and greatly reduce Fluorescence quenching thus increasing the sensitivity.
- Unique high volume reagent storage positioned outside of the instrument to reduce contamination.
- Connection of carrier and reducer liquids to instrument using long life chemical resistant FEP tubing.

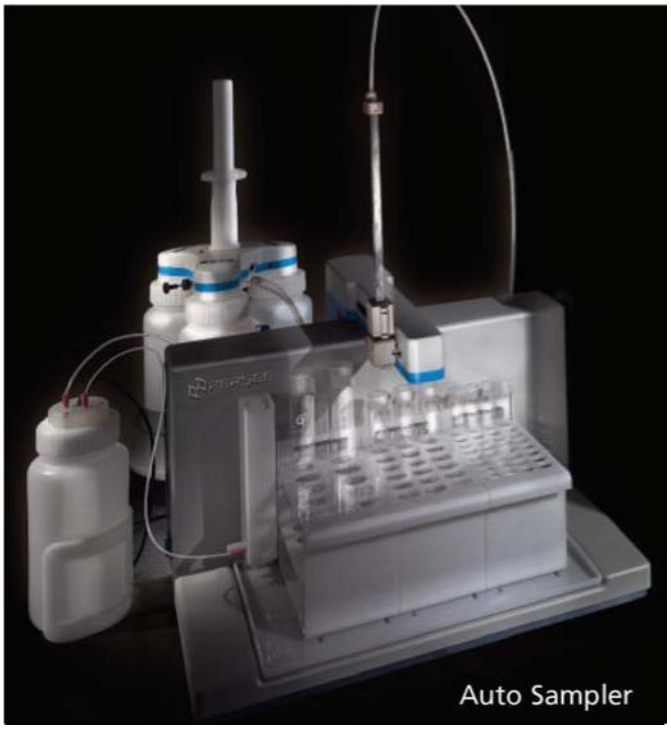
Electronic Control

- High technology electronics and PCB components.
- PF Win 3.0 software offers full control of PF7 instrument and accessories.
- Windows operating software
- New features include: QC functions, online data sharing, self diagnostics, result and resource management.
- Full GLP version available for multiuser group management and log.

PF7 continued

Detection Limits

Element	Detection Limit (ug/l)	RSD %
Arsenic (As)	<0.01	<1%
Bismuth (Bi)	<0.01	<1%
Cadmium (Cd)	<0.001	<1%
Germanium (Ge)	<0.05	<1%
Mercury Hg)	<0.001	<1%
Lead (Pb)	<0.01	<1%
Antimony (Sb)	<0.01	<1%
Selenium (Se)	<0.01	<1%
Tin (Sn)	<0.01	<1%
Tellurium (Te)	<0.01	<1%
Zinc (Zn)	<1.0	<1%



Accessories

Auto Sampler

- X, Y, Z drive configuration.
- Fully controlled by PFWin software.
- Inert robust probe and FEP tubing.
- Improved probe wash. Simultaneous inner and outer wall wash.
- Large volume standard stock solution.
- Removable inert sample tray and rack.
- 3 sizes of sample racks available to accommodate 10ml, 25ml and 50ml test tubes.

Speciation Analyser

- Built in HPLC pump. Isocratic/gradient
- Fitted with conventional column (optional column oven available).
- Manual or automatic sample input (with optional auto sampler).
- Detect and separate inorganic and organic compounds.
- High separation performance
- Fast analysis < 12min.

Speciation Detection Limits

Element	Specification	Detection Limit (ug/l)	RSD %
As	Arsenite (As III)	0.04	<5%
	Dimethylarsenic acid (DMA)	0.08	<5%
	Monomethylarsenic acid (MMA)	0.08	<5%
	Arcenate (As V)	0.2	<5%
Hg	Inorganic (Hg II)	0.05	<5%
	Methylmercury (MeHg)	0.05	<5%
	Ethylmercury (EtHg)	0.05	<5%
	Phenylmercury (PhHg)	0.1	<5%
Se	Selenocysteine (SeCys)	0.3	<5%
	Selenite (Se IV)	0.1	<5%
	Selnomethionine (SeMet)	2.0	<5%
	Selenate (SE VI)	0.5	<5%
Sb	Sb III	0.1	<5%
	Sb V	0.5	<5%

Specifications

Specifications	PF7
Sample Atomisation	
Atomiser	Quartz furnace tube with auto ignition
Furnace Heating	Computer controlled heating
Hydride Generator	Continuous flow high performance for cold vapour Mercury and hydride determinations of As, Se, Te, Bi, Sb, Sn, Zn, Pb, Cd, Ge
Gas Requirement	High purity Argon gas (99.99%) 30psi
Exhaust System	2 stage filtration to decontaminate pollutants
Sample and delivery	
Carrier and Reagent Delivery	Gas pressure driven system
Gas/Liquid Separator	High efficiency gas/ liquid separator with magnetic stirring and Peltier cooling
Optics	
Optical Design	Short focal length non- dispersive double beam
Light Source	3 channel simultaneous element analysis using computer controlled modulated and pulsed hollow cathode source
Baseline Stability	< 1.5%
Baseline Noise	< 1.5%
Linear Range	$>10^3$
Operating System	
Interface	USB, RS232
Operating Software	PFWin software
Safety	Gas alarm for low pressure and flow
Power Requirements	100 – 240V 50Hz/60Hz 300VA
weight	Net: 35Kg Gross 50Kg
Dimensions	60cm x 57cm x 45cm

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