

# Laser Flash Photolysis System

## TSP-1000 / TSP-1000M

TSP-1000 is a laser flash photolysis system for use in the measurement of transient absorbance. It is in wide use for the analysis of the elementary processes of photochemical reactions. With a nanosecond pulsed laser as the exciting light source, this system makes it possible to measure transient UV-VIS absorption in a broad range of nanosecond to milisecond.



Data are acquired by the combination of a photomultiplier detector and a digital oscilloscope in the single-wavelength monochromator system, and by the combination of a photodiode array detector and a high-speed AD converter in the multi-channel spectrophotometer system. In both systems, time resolution up to 10 nsec is available.

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## TSP-1000 / TSP-1000M



### System Components

		TSP-1000 (M)-01	TSP-1000 (M)-02R	TSP-1000 (M)-03R
Exciting light Source SLI type	1	✓ (-)	✓ (-)	✓ (-)
Exciting light Source ML II type	1	(-) ✓	(-) ✓	(-) ✓
Monitoring light Source (150W Xe lamp)	1	✓	✓	✓
Light Guide for light path	1	✓	✓	✓
Sample cell holder	1	✓	✓	✓
Data Processor	1	✓	✓	✓
Spectrometer MF200 (-01) *1	1	✓	-	-
Spectrometer MD308 (-03) *2	1	-	✓	✓
Monochromatic Detector	1	✓	-	✓
Multi-channel Detector	1	-	✓	✓

\*1 Use for Single-wavelength monochromator system \*2 Use for Multi-channel spectrophotometer system

### Standard Systems

Single-wavelength Monochromator System

**TSP-1000(M)-01R**

Multi-channel Spectrophotometer System

**TSP-1000(M)-02R**

Single-wavelength/Multi-channel Spectrophotometer System

**TSP-1000(M)-03R**

### Specifications

#### Exciting Light Source (Pulsed YAG Laser)

Pulse Width	4 ~ 6 nsec
Energy (TSP-1000)	200mJ@532nm, 60mJ@355nm
Energy (TSP-1000M)	25mJ@532nm, 8mJ@355nm
Repetition Rate	10Hz (single pulse available)

#### Monochromatic Detector

Lamp	150W Xe arc lamp of high stability
Lamp House	Air-cooling type
Light Intensity Adjustment	Iris function available with a space to insert an optical fiber

#### Light Guide for Light Path

Material	Fiber optics made of quartz (transmittable in the range of 200nm ~ 1000nm)
Length	1m

#### Sample Cell Holder

Temperature Range	5°C ~ 60°C
Temperature Control	By a bath circulator
Cell	10mm-square quartz cell (transparent in 4 sides)
Spaces for Optical Filters	At the exciting side and the detection side

#### Data Processor

OS	Windows® 7 or later
Control Interface	DIO (PCI), GPIB (PCI)
Software	Averaging, Overlaying, Converting of wavelength axis and time axis, Non-linear least squares fitting, Data storing in text format

### Single-Wavelength Monochromator System

#### Spectrometer MF200

Optical Alignment	Czerny-Turner grating
Focal Distance	200mm
Speed	F/3.5
Linear Dispersion	8.5nm/mm
Slit Width	0.1mm, 0.2mm, 0.5mm

#### Monochromatic Detector

Detector	Photomultiplier tube
Response	5nsec or less
High-voltage Power Supply	0 ~ 1100 V adjustable
Control Circuit	Wavelength scanning circuit
Digital Oscilloscope	High Voltage feedback circuit Sampling rate: 1.25GS/sec max Vertical sensitivity: 1mV/div ~ 10V/div Time axis range: 40nsec/div ~ 10sec/div

### Multi-Channel Spectrophotometer System

#### Spectrometer MD308

Optical Alignment	Czerny-Turner grating
Gratings	3 different gratings automatically changeable
Focal Length	300mm
Speed	F/4
Linear Dispersion	5.4nm/mm (when using the 600g/mm grating)
Slit Width	10mm ~ 3mm continuously changeable

#### Multi-Channel Detector

Detector	Photodiode array 1024ch with a gated image intensifier
Time Resolution	5nsec ~ 10µsec
Image Intensifier Gain	Adjustable
Synchronization Control	Pulse generator with GPIB interface
Wavelength Range of Simultaneous Measurement	100nm, 200nm, 400nm (400nm when using MF200)

Specifications and appearances are subject to change without prior notice

### Optional Accessories

Exciting Light Source 266nm  
OPO Wavelength-Changeable Laser

Low-Temperature Cell Chamber (-80°C ~ 100°C)  
Stopped-Flow Mixer (for flow flash measurement)

Bath Circulator  
Optical Filters

\*Other optional accessories are available upon request.

**UNISOKU Co., Ltd.** 

E-mail: [info@unisoku.co.jp](mailto:info@unisoku.co.jp) Web site: <http://www.unisoku.com/>

2-4-3 Kasugano, Hirakata, Osaka 573-0131 Japan

TEL +81-72(858)6456 FAX +81-72(859)5655

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