

## Maximize Bioprocess Efficiency

### Photometer and Single-Use Flow Cell



#### Versatile Application

The PM2 Photometer is available in benchtop and panel mount versions, making it adaptable for different systems and environments.



#### Multiple Wavelength Configurations

It can be factory-configured with seven different wavelength combinations, including 260 nm, 280 nm, 300 nm, 880 nm, as well as ranges such as 260-280 nm, 280-300 nm, and 280-880 nm.



#### Compatibility with Control Systems

The PM2 Photometer easily integrates with higher-level control systems, including PLCs and HMIs. It supports digital communication protocols such as Modbus over RS485 and Modbus-TCP.



#### Non-invasive Turbidity Measurements

The Flow Cell streamlines turbidity measurement processes by minimizing contamination risks and eliminating cleaning requirements.



#### Innovative Solution

For UV Absorbance and Turbidity Measurement

The PM2 Photometer is an extremely adaptable instrument suitable for both laboratory and process applications. It is designed to work with a monitor that has data acquisition capabilities. METTLER TOLEDO Pendotech offers solutions like the PressureMAT™ PLUS models, which can connect to a PC for data logging, along with Pendotech Process Control Systems. The transmitter provides two 4-20 mA signals that correspond to a range of 0 to 3 AUs, enabling effective monitoring of the photometer's readings, which can also be displayed locally. Furthermore, other data acquisition devices equipped with analog inputs can connect to the transmitter's output signals for data collection and storage. The PM2 Photometer's output signals, along with its compatibility with various data acquisition devices and control systems, make it a flexible and versatile option for monitoring bioprocesses.

## Turbidity System

In bioprocess operations, measuring the turbidity of liquids post-filtration is crucial for assessing filter performance. Turbidity readings can be directly taken from unclarified materials in bioreactors or fermentation vessels. Utilizing an 880 nm wavelength along with pressure measurements helps evaluate filter effectiveness in constant flow filtration processes. The Pendotech Turbidity System facilitates sample analysis and consists of essential components such as the Pendotech photometer light source and Pendotech flow cells. The Pendotech Single-Use Flow Cell is designed for non-invasive measurements and incorporates a unique silica glass lens that enables turbidity measurement without direct contact with the product. Larger path length flow cells are recommended for optimal results. Testing indicates that the 6.5 cm flow cell is most effective for turbidity levels under 400 NTU, while the 1 cm flow cell is better suited for applications exceeding this threshold.



Single-Use Flow Cell Stand -  
6.5 cm path length



Single-Use UV Flow Cell  
SPECPS-880-6CM

NTU Standard Measurement, Dynamic Range and Repeatability		
Flow Cell Optical Path Length (OPL)	Approximate Maximum Dynamic Range (NTUs)	Precision/Repeatability (approx)
2.5 in (6.5 cm)	425	±2NTUs
0.4 in (1 cm)	2750	±14NTUs
0.2 in (0.5 cm)	6000	±30NTUs

## Single-Use Flow cell

Flow cells are offered in a range of sizes, including a 3/4 inch sanitary flange with a 6.5 cm path length, a 1/2 inch hose barb with a 1 cm path length, a 1/4 inch hose barb with a 0.5cm path length, and a 1/8 inch hose barb with a 2 mm path length. All polymeric materials within the fluid path comply with USP Class VI standards, and the flow cells are manufactured in an ISO 9001 certified facility. Additionally, the flow cell can withstand gamma and X-ray irradiation up to 50 KGy and can be autoclaved at temperatures of up to 121°C.

### Photometer Specifications

Optical Configuration	LED light source
Optical Connectivity	SMA-905
Mechanical	W 4 in (10.2 cm) x L 4 in (10.2 cm) x H 2.5 in (6.4 cm) Weight: ~1.5 lbs.
Power Requirement	24 VDC nominal, 2.7 W max power
Output	4-20mA (Active/sourcing) spanned 0-3AU
Analog Loop Resistance	500 ohms at 24 VDC
Operating Temperature	41 to 122°F (5 to 50°C)
Storage Temperature	-4 to 122°F (-20 to 50°C)
Measurement Range	0.000-3.00AU
Response Time	1 second
Maximum Zero Shift	±0.1% full scale (±0.002 AU)
Accuracy*	0-2 AU ±1% FS (±0.03 AU) ; 2-3 AU ±2% FS (±0.06 AU)
Long Term Output Drift	±0.1% full scale (±0.002 AU)
Repeatability	±0.5% full scale (±0.015 AU)
LED Lifetime	> 5 years
Available Wavelengths	260, 280, 300 and 880 nm

\* Accuracy is dependent on system arrangement and proper tare

### Single-Use Flow Cell Specifications

Manufacturing Testing	Each product is leak-tested to confirm integral assembly Each product is visually inspected to confirm optical clarity of lenses
Material	Polysulfone and fused silica with silicone O-ring
Pressure Range	Rated for pressure up to 75 psi (5 bar)
Biocompatibility	All materials in contact with product fluid path meet USP Class VI requirements
Regulatory and Compliance Testing	<ul style="list-style-type: none"> <li>• USP Class VI • ISO 10993-5 • AEC • Bioburden</li> <li>• REACH Compliant • RoHS Compliant</li> <li>• Bacteriostatic and Fungistatic (B&amp;F)</li> </ul>
Manufacturing Environment	ISO 7 clean room
Gamma Irradiation	Up to 50 kiloGrays
X-ray Irradiation	Up to 50 kiloGrays
Operating Temperature	2°C to 50°C (other ranges with process qualification)
Storage Temperature	-25°C to 65°C
Shelf Life	>5 years
Packaging	Individually packaged in polybag



Single-Use Flow Cell Stand -  
1 cm path length



Single-Use UV Flow Cell  
SPECPS-N-050

## Ordering Information

Photometers	Order Nr.
Photometer PM2 260 nm	30849447
Photometer PM2 280 nm	30849498
Photometer PM2 300 nm	30849499
Photometer PM2 880 nm	30849500
Photometer PM2 260-280 nm	30849501
Photometer PM2 280-300 nm	30849502
Photometer PM2 280-880 nm	30849503
Single-Use Flow Cells	Order Nr.
Single-Use UV flow cell, 0.08 in (2 mm) path length, non-sterile, polysulfone, 1/8 in (0.318 cm) hose barb	SPECPS-N-012
Single-Use UV Flow Cell, 0.2 in (0.5 cm) path length, non-sterile, polysulfone, 1/4 in (0.64 cm) hose barb	SPECPS-N-025
Single-Use UV Flow Cell, 0.4 in (1 cm) path length, non-sterile, polysulfone, 1/2 in (1.28 cm) hose barb	SPECPS-N-050
Single-Use Flow Cell, 2.5 in (6.5 cm) path length, non-sterile, polysulfone, 3/4 in (6.5 cm) sanitary flange inlet/outlet	SPECPS-880-6CM
Couplers, Cables & Power Cords	Order Nr.
Optical couplers SU flow cell pair	30849506
Optical fiber photometer 1.64 ft (0.5 m)	30830317
Optical fiber photometer 2.29 ft (0.7 m)	30919657
Optical fiber photometer 3.28 ft (1 m)	30830318
Optical fiber photometer 6.56 ft (2 m)	30830319
Optical fiber photometer 9.84 ft (3 m)	30830320
Panel mount SMA-905 connector (for pass-through)	SPEC-OC-PANEL
Power Cord CN 3 Prong	30305179
Panel Cord EU 3 Prong	30305178
Panel Cord UK 3 Prong	30305174
Panel Cord US 3 Prong	30305173
Main Cable CH, 3P - For PM2 Photometer (Swiss power cord)	87920
Accessories	Order Nr.
Calibration kit with standards 3AU	30849507
Replacement standards for calibration kit	30849508
Single-Use Flow Cell Stand 2.5 in (6.5 cm) path length	30849504
Single-Use Flow Cell Stand 0.4 in (1 cm) path length	30849505
Analog display with 4 inputs with alarm inputs and serial port for data collection	PMAT-DAQ
Analog display with 4 inputs, 4 analog outputs, alarms, and serial port for data collection	PMAT-DAQ-A
Pendotech Photometer DIN rail mounting kit, includes mounting plate and mounting hardware	PHOTO-DR
Interface Cables	Order Nr.
Cable from single-channel PM2 photometer to Pendotech PressureMAT analog input, 6ft	PDKT-PM2-1-PMAT
Cable from dual-channel PM2 photometer to Pendotech PressureMAT analog input, 6ft	PDKT-PM2-2-PMAT
Cable from single-channel PM2 photometer to Pendotech PCS Control System (DAQ/TFF), mA, 6ft	PDKT-PM2-1-PCS
Cable from dual-channel PM2 photometer to Pendotech Gen 2 TFF Control System, mA, 6ft	PDKT-PM2-2-PCS
Cable from single-channel PM2 photometer to PDKT-BOX-NFFSS breakout box, M8 male, mA signal, 6ft	PDKT-PM2-1-NFFSSB
Cable from dual-channel PM2 photometer to PDKT-BOX-NFFSS breakout box, 6ft	PDKT-PM2-2-NFFSSB
Cable from dual-channel/turbidity photometer to flying leads, 6ft	PDKT-PM2-FL



Calibration kit with standards