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The Doric Visible Fluorescence Detector is designed specifically for use in fiber photometry experiments. Its high gain and low noise allow it to detect signals in the sub-picowatt to nanowatt range. When used with a modulated light source and a lock-in amplifier it can detect signals in the femtowatt range. The following document describes the detector’s components and their usage.

1.1 Fluorescence Detector Head

The Fluorescence Detector Head is used to detect fluorescence signal. The detector uses a specialized shielded cable to connect to the amplifier, keeping noise to a minimum. It contains the following elements.

- The Electrical Connector is an M5 type connector used to link the head and the amplifier using a shielded M5 cable.
- The detector head is provided with an FC adapter (Fig. 1.1). This allows the detector to be connected to a fiber-optic patch cord and other connectorized devices.

1.2 Fluorescence Detector Amplifier

The Fluorescence Detector Amplifier amplifies the signal coming from the detector head and transmits it to a recording system using a BNC output. It contains the following elements.

- The FDH Connector (Fig. 1.3) is an M5 type connector used to link the amplifier and the head using a shielded M5 cable.
- The V out Connector (Fig. 1.3) is a BNC type connector used to connect the fluorescence detector with a DAQ system.
The **Power Indicator** light (Fig. 1.3) shines green when the detector is on.

- The **Amplifier Mode** switch (Fig. 1.3) is used to switch the detection mode from **Off** to **AC** or **DC**.
- The **Amplification Level** switch (Fig. 1.3) allows the choice of amplification levels at 1, 10 or 100 times.
- The **Power Supply** connector, located on the back of the unit, is used to connect the 12 V power supply to the amplifier.

### 1.3 Fluorescence Detector Cable

The *Fluorescence Detector Cable* is used to connect the detector head and amplifier. This is a shielded twisted pair M5 connectorized electrical cable.

### 1.4 Battery Pack

There are two available battery packs.

- A **9V Battery Pack** (Fig. 1.4a) using standard 9V/E type battery, as well as two 9V/E batteries are shipped with each detector. These allow optimal usage of the detector when wall plugs are unavailable or when the current from a wall plug introduces significant noise in the signal. The pack can be connected directly to the **Power Supply** port and a single battery will last an average of 20 hours.
A Rechargeable Battery Pack (Fig. 1.4b) can be provided when requested. These 12V 6000 mAh battery packs can keep a single detector powered for approximately 1 week without interruption. These power supplies are ideal for those who want to use the detectors solely using battery power.
2.1 Fluorescence Detector Installation

The following section describes the basic usage of the Fluorescence Detector.

1. Connect the power supply or battery pack to the Power Supply Connector of the Fluorescence Detector Amplifier.

2. Using the M5 Cable, connect the amplifier and the Fluorescence Detector Head.

3. Flip the Amplifier Mode switch from the off state, and use the Amplification Level switch to select the amplification desired.
3 Specifications

3.1 Specifications

Table 3.1: Doric Fluorescence Detector Specifications

<table>
<thead>
<tr>
<th>SPECIFICATION</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength Range (nm)</td>
<td>320-1100</td>
</tr>
<tr>
<td>Peak Sensitivity Wavelength (nm)</td>
<td>960</td>
</tr>
<tr>
<td>Peak Responsivity (A/W)</td>
<td>0.6</td>
</tr>
<tr>
<td>Output Impedance (Ω)</td>
<td>50</td>
</tr>
<tr>
<td>NEP (W/√Hz)</td>
<td>&lt;12</td>
</tr>
<tr>
<td>DC Bandwidth (Hz)</td>
<td>0-1000</td>
</tr>
<tr>
<td>AC Bandwidth (Hz)</td>
<td>30-1000</td>
</tr>
<tr>
<td>CW Saturation Power (nW)</td>
<td>4.75</td>
</tr>
<tr>
<td>Output Connector</td>
<td>Male BNC</td>
</tr>
<tr>
<td>Detector Material</td>
<td>Si</td>
</tr>
<tr>
<td>Detector Size (mm x mm)</td>
<td>1.1 x 1.1</td>
</tr>
<tr>
<td>Amplification level</td>
<td>1x 10x 100x</td>
</tr>
<tr>
<td>Transimpedance Gain (V/A)</td>
<td>2x10^9 2x10^10 2x10^11</td>
</tr>
<tr>
<td>Maximum Conversion Gain (V/W)</td>
<td>1.2x10^9 1.2x10^10 1.2x10^11</td>
</tr>
</tbody>
</table>
4.1 Maintenance

The product does not require any maintenance. Do not open the enclosure. Contact Doric Lenses for return instructions if the unit does not work properly and needs to be repaired.

4.2 Warranty

This product is under warranty for a period of 12 months. Contact Doric Lenses for return instructions. This warranty will not be applicable if the unit is damaged or needs to be repaired as a result of improper use or operation outside the conditions stated in this manual. For more information, see our Website.

4.3 Contact us

For any questions or comments, do not hesitate to contact us by:

Phone  1-418-877-5600
Web    doriclenses.com/contact
Email  sales@doriclenses.com