Improved detection limit for near infrared (to 900 nm)

**FEATURES**
- Low dark current (1/50 of that at room temperature)
- Fast cooling (3 minutes) by thermoelectric cooler directly coupled to the photocathode
- Wide dynamic range
- Free of condensation

**APPLICATIONS**
- NOx Gas Detection
- Fluorescence Detection (LIF, Fluorescence Spectrophotometer)
- Chemiluminescence Detection
- NIR Spectroscopy

**COOLING SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description / Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling Method</td>
<td>Thermoelectric cooling</td>
<td>—</td>
</tr>
<tr>
<td>Max. Cooling Temperature ((\Delta T)) *1 *2</td>
<td>20</td>
<td>°C</td>
</tr>
<tr>
<td>Cooling Time *1</td>
<td>Approx. 3</td>
<td>min</td>
</tr>
</tbody>
</table>

*1: Input current to thermoelectric cooler = 2.1 A  *2: Photocathode temperature difference from ambient

**COOLING CHARACTERISTICS**

- **S/N Ratio During Cooling**

  

  ![Graph showing the SN ratio during cooling](image)

  - Light Source: LED 850 nm
  - Energy: \(4.9 \times 10^{-14} \text{ W}\)
  - Data Acquisition Speed: 8 times/s

- **Anode dark current after cooling has started**

  

  ![Graph showing the anode dark current](image)

  - Control Voltage: +1.0 V
  - PMT Supply Voltage: -1000 V

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## SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage</td>
<td>+11.5 to +15.5</td>
<td>V</td>
</tr>
<tr>
<td>Max. Input Voltage for Main Unit</td>
<td>+18</td>
<td>V</td>
</tr>
<tr>
<td>Max. Input Current for Main Unit</td>
<td>40</td>
<td>mA</td>
</tr>
<tr>
<td>Max. Input Voltage for Thermoelectric Cooler</td>
<td>3.75</td>
<td>V</td>
</tr>
<tr>
<td>Max. Input Current for Thermoelectric Cooler</td>
<td>3.9</td>
<td>Ω</td>
</tr>
<tr>
<td>Max. Output Signal Current</td>
<td>58</td>
<td>µA</td>
</tr>
<tr>
<td>Max. Control Voltage</td>
<td>+1.2 (Input impedance: 100 kΩ)</td>
<td>V</td>
</tr>
<tr>
<td>Recommended Control Voltage Adjustment Range</td>
<td>+0.3 to +1.1</td>
<td>V</td>
</tr>
<tr>
<td>Effective Area</td>
<td>10 × 14</td>
<td>mm</td>
</tr>
<tr>
<td>Spectral Response Range</td>
<td>185 to 900</td>
<td>nm</td>
</tr>
<tr>
<td>Peak Sensitivity Wavelength</td>
<td>400</td>
<td>nm</td>
</tr>
<tr>
<td>Luminous Sensitivity Min.</td>
<td>140</td>
<td>µA/lm</td>
</tr>
<tr>
<td>Luminous Sensitivity Typ.</td>
<td>300</td>
<td>µA/lm</td>
</tr>
<tr>
<td>Blue Sensitivity Index (CS 5-58)</td>
<td>9.0</td>
<td>—</td>
</tr>
<tr>
<td>Red / White Ratio (R-68)</td>
<td>0.3</td>
<td>—</td>
</tr>
<tr>
<td>Radiant Sensitivity *3</td>
<td>76</td>
<td>mA/W</td>
</tr>
<tr>
<td>Luminous Sensitivity Min.</td>
<td>400</td>
<td>A/lm</td>
</tr>
<tr>
<td>Luminous Sensitivity Typ.</td>
<td>3000</td>
<td>A/lm</td>
</tr>
<tr>
<td>Radiant Sensitivity *3 *4</td>
<td>7.6 × 10⁵</td>
<td>A/W</td>
</tr>
<tr>
<td>Radiant Sensitivity *3 *4 *5</td>
<td>1.0 × 10⁷</td>
<td>—</td>
</tr>
<tr>
<td>Dark Current *4 *5</td>
<td>0.1</td>
<td>nA</td>
</tr>
<tr>
<td>Equivalent Noise Input (ENI) *3 *4 *5</td>
<td>2.4 × 10⁻¹⁷</td>
<td>W</td>
</tr>
<tr>
<td>Rise Time *4</td>
<td>2.2</td>
<td>ns</td>
</tr>
<tr>
<td>Settling Time *5</td>
<td>0.2</td>
<td>s</td>
</tr>
<tr>
<td>Operating Ambient Temperature *7</td>
<td>+5 to +40</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature *7</td>
<td>-20 to +50</td>
<td>°C</td>
</tr>
<tr>
<td>Weight</td>
<td>296</td>
<td>g</td>
</tr>
</tbody>
</table>

*3: At peak sensitivity wavelength  
*4: Control voltage +1.0 V (PMT supply voltage -1000 V), with cooler operated  
*5: After 30 minutes storage in darkness  
*6: The time required for the output to reach a stable level following a change in the control voltage from +1.0 V to +0.5 V.  
*7: No condensation

## CHARACTERISTICS

### Spectral Response

![Spectral Response Graph](image)

### Equivalent Noise Input (ENI)

![Equivalent Noise Input Graph](image)
Sensitivity Adjustment and Cooling Operation

**Gain vs. Control Voltage**

![Graph showing the relationship between gain and control voltage.]

**Plateau Characteristic**

![Graph showing the plateau characteristic.]

### Sensitivity Adjustment and Cooling Operation

**Voltage Programming**
- Power supply for cooling fan: +12 V to GND
- Power supply for thermoelectric cooler: +3.2 V to 2 A to 2.8 A

**Resistance Programming**
- Power supply for cooling fan: +12 V to GND
- Power supply for thermoelectric cooler: +3.2 V to 2 A to 2.8 A

- Adjust the control voltage when adjusting the anode sensitivity of the PMT.
- Electrically isolate the reference voltage output. (This output is not used.)
- Low voltage input can also be used to supply the power to the cooling fan. In this case, the low voltage input must be set to +12 V.
- Always run the cooling fan while the thermoelectric cooler is operating.

- Monitor the control voltage when adjusting the anode sensitivity of the PMT with a trimmer potentiometer.
- A C-mount adaptor is available for H7844. (Sold separately)
PHOTOSENSOR MODULE
WITH THERMEOLECTRIC COOLER H7844

DIMENSIONAL OUTLINE (Unit: mm)
*Dimensional tolerance is ±0.5 mm unless otherwise specified.

When installing the H7844 photosensor module, be sure to allow enough space around the cooling fan for heat dissipation.

ACCESSORIES (Supplied)

Power cable with connector (HIROSE HR10A-7P-6S)
- BLACK: GND
- WHITE: +15 V
- BLUE: +1.2 V

Thermoelectric cooler cable (JST SLP-02V)
- GND: AWG18 (GREEN)
- RED: AWG18 (ORANGE, +3.2 V, 2 A to 2.8 A)

Cooling fan lead wire (AMP 179228-3)
- BLACK: GND
- RED: +12 V
- WHITE: +24 V

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