Supplemental Digital Content 1. Text that provides the description of the illumination device

**Illumination device**

**1. General Description**

In order to perform illumination experiments in 96-well microtiter plates, we constructed a device to evenly illuminate an entire microtiter plate at once. A general view of the illumination device is shown in **Fig. 1**. The illumination device consists of the following main blocks: 1. **Light Engine**: 54 Royal-Blue Philips Rebel LEDs on eighteen Tri-star MPCB bases mounted on a copper heat spreader inside a Meta-Phase 10" Dome (Fig. 1- **1**), UV and Blue filters (Fig. 1- **2**); 2. **Heat management**: Air cooled heat sinks (Fig. 1- **4**) with temperature-controlled fans (Fig. 1- **5)**.

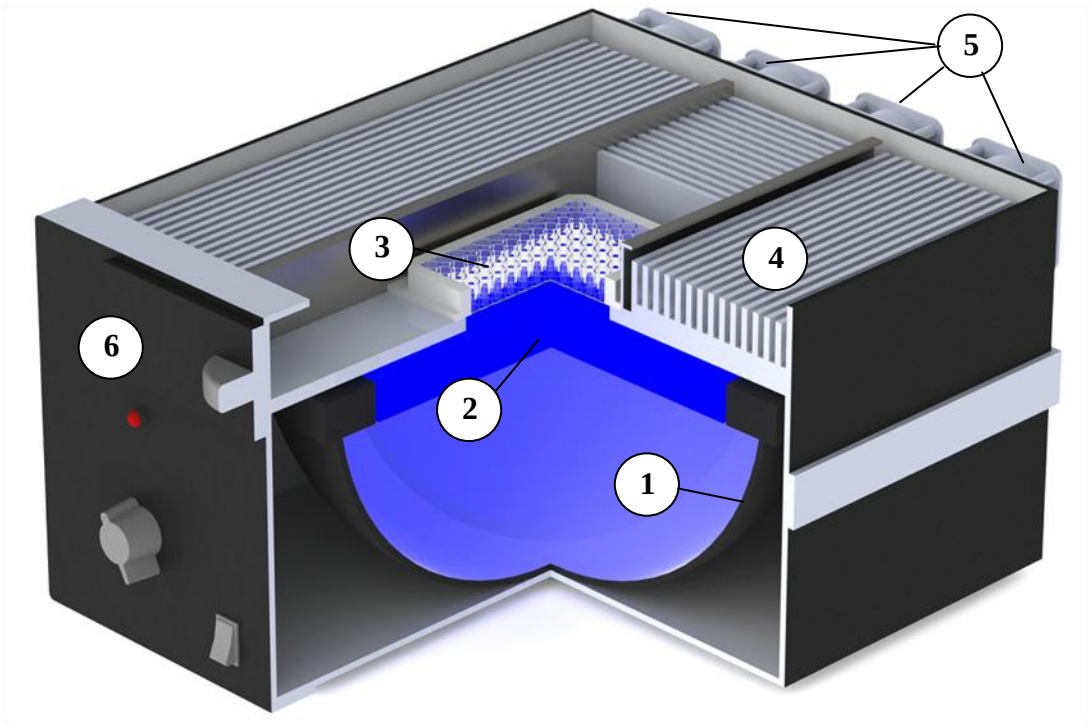


***Fig. 1.*** *A general view of the illumination device*.1- Light mixing hemisphere structure (dome); 2 - UV and blue filters; 3 - 96-well microtiter plate. 4 - Heat sink; 5 - Fans; 6 - Control panel.

Thus, the illumination device is based on the use of a dome type LED illumination system. In this instrument, 54 LEDs are placed on the O-ring, which serves as a radiator sink. The O-ring is inserted into hemisphere structure (dome), the inner surface of which is coated coarsely with the white paint for better light mixing and reflection. Thus, light emitted by LEDs is mixed on and reflected by the hemisphere surface, passes through UV and blue filters (**2**) providing very even illumination of the microplate (Fig. 1- **3**). A view of the front panel and controls of the device are shown in **Fig. 2.**

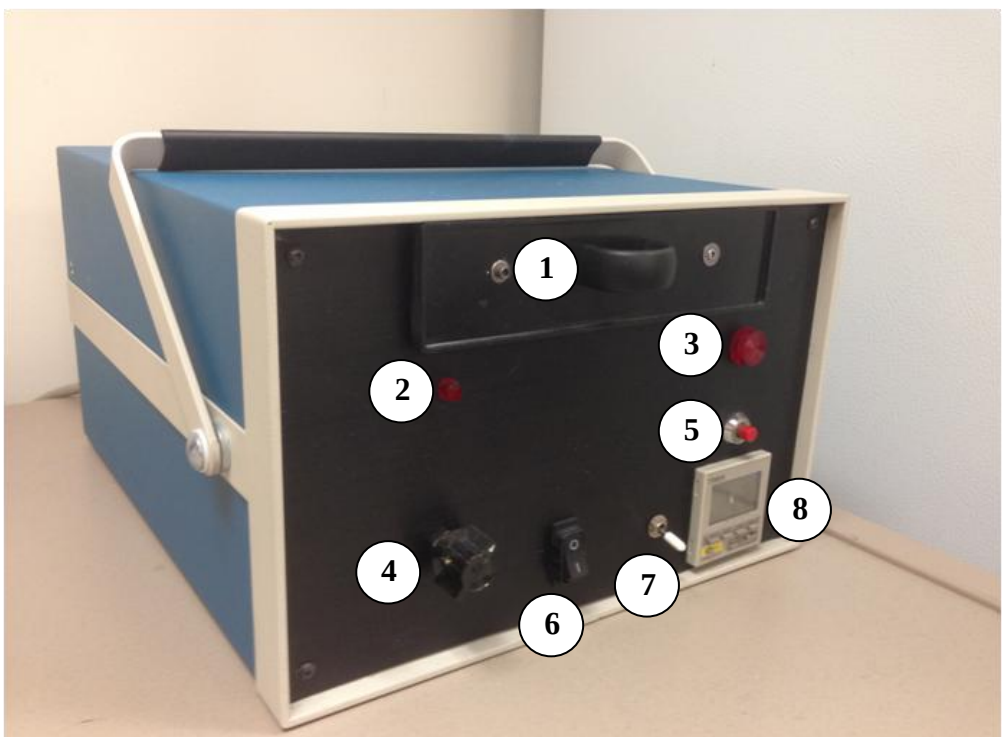


***Fig. 2.*** *Front Panel and controls.*1- Manual tray with handle for samples loading; 2 - LED indicator. Indicates that Electrical POWER is ON; 3 - Power ON indicator. Indicator is ON when device is in use and illuminator optical power is ON. 4 - Optical power level switch; 5 - START button; 6 - Electrical power ON/OFF switch; 7 - Fan switch; 8 - Timer.

**2. Specification**

The main characteristics of the illumination device include:

1. Package: Standard desktop type instrument housing from BUD Industries with removable front panel. Dimensions: 7" (17.8 cm) x 11.06" (28.1cm) x 14.5" (36.8 cm)

2. Manual loading mechanism (Fig. 2- **1**) for repeatable and safe operation.

3. Optical Power. Illuminator allows 10 optical power levels set up using an optical power level switch (Fig. 2 (**4**)). Note that average optical power density at different power settings was measured using large area thermopile detector at different locations across the emitting area. Then, the Total Optical Power was calculated using following equation: TOTAL POWER (W) = AVERAGE POWER DENSITY ($W/cm^2$) x TOTAL AREA ($cm^2$). The illuminator provides total optical power up to 50.3W**.** In the present study, the samples were illuminated at an average power density of 0.044 $W/cm^2$.

4. Optical power density uniformity. The uniformity of the illumination provided by the device was examined in two ways: 1) by small area thermopile detector; and 2) actinometrically. The uniformity of illumination was within ±1% of the reference standard.

5. Spectral power distribution has center wavelength near 450nm with full width at half maximum of 28 nm.

6. High optical power stability: no shift in the light intensity for 1 hour of continuous work of the instrument.

7. Timer (Fig. 2- **8**): High resolution, multifunction digital timer OMRON H5CR.