

Section 5D

ACCEPTANCE TESTS FOR PHOTOCELLS

Unless otherwise stated in the Test Specification Photocells shall comply with the following requirements together with those given in the Test Specification and with all other sections in this specification except 5.2, 5.3, 5.4, 5.10, 5A, 5B, 5C, 5E, and 5F.

A general inspection of the physical features of the valve shall be made and if it does not comply with the requirements of this specification and of the Test Specification it shall be rejected.

The glass bulb shall be free from defects which may cause distortion of the light falling on the cathode surface.

5.D.1. General Test Requirements. The photocell to be tested shall be placed in an enclosure which screens it from all unwanted radiation. Arrangements shall be made to permit radiation to reach the cell as required by the subsequent clauses of this section and of the Test Specification. Suitable baffles shall, however, be provided to ensure that only direct radiation from the test lamp reaches the cell. The distance between the lamp and the cell shall be large compared with the greater dimension of the cathode (e.g. 20 times).

5.D.2. Light Sources for Test Purposes

5.D.2.1. The light source shall be an incandescent tungsten lamp controlled to operate at 2854°K. At least three lamps shall be certified for luminous intensity and colour temperature at a recognised photometric laboratory. One of these lamps shall be used for testing photocells and the others shall be used for the purpose of checking the calibration of the test lamp.

5.D.2.2. During the life of the test lamp frequent reassessment of calibration shall be made against the standard check lamps. Suitable adjustment shall be made to the position of the lamp to ensure that the light falling on the cell remains at a constant value. The use of any lamp shall be discontinued when the luminous intensity has fallen by 20% of the original value.

5.D.3. Dark Current. The photocell shall be shielded from all radiation and a voltage as specified in the Test Specification shall be applied to the anode. Under these conditions the anode current shall not exceed the specified limit.

5.D.4. Sensitivity Tests. Sensitivity tests shall be carried out with the photocell under test in a suitable enclosure provided with an aperture such that not less than half the cathode area is illuminated with a specified value of light flux.

5.D.5. Spectral Response. A filter, as required by the Test Specification, shall be interposed between the light source and the cell and the output voltage or anode current measured under specified conditions. A further measurement shall then be made without the filter. The ratio of the two readings of voltage or anode current shall be within the limits specified.

5.D.6. Gas Amplification Factor. Where the Test Specification requires a test for the gas amplification factor the conditions shall be as detailed in clause 5.D.4. The anode current shall be measured at the working value of voltage and at a fixed value of 25 volts. The ratio of the two anode current readings shall be within the limits specified.

5.D.7. Sensitivity of Photomultipliers

5.D.7.1. Cathode Photo Sensitivity. With the anode and multiplier dynodes strapped and with a specified voltage applied between them and the cathode the sensitivity shall be measured as for simple photo emissive cells and shall be within the limits specified.

5.D.7.2. Overall Sensitivity. With the specified voltages applied to the dynodes and anodes, the sensitivity shall be measured as for simple photo emissive cells and the overall sensitivity shall be within the limits specified.