Photovoltaics Lab at Ioffe Physical Technical Institute
"TECHNOEXAN" Ltd. an innovation company of the Ioffe Institute

FLASH SOLAR SIMULATOR FOR SORTING THE MULTIJUNCTION CELLS

Installation function

The Simulator is an illumination system operating together with electronic and mechanical equipment for sorting the multijunction concentrator solar cells. Photovoltaic conversion efficiency may be evaluated at I-V measurements of the individual cells in a wide range of sun concentration ratios under flash illumination.

External view of the Simulator with power supply.

Flash/Light Parameters

Illumination intensity without flash lamp filtering, over 0.5x0.5 cm^2 area…...up to 5000 "suns".
Adjustment of a light spot area by variation of the distances in a "lamp-condenser-cell" system.
Light pulse duration on a flat part (at +/-2% stability)…….....….1 millisecond.
System light intensity stability……2% flash-to-flash over 1 hour, 3% over 4 hours.
Repetition rate of the light pulses .....as fast as 1 pulse per 10-15 seconds (at intellectual power-safety capacitor charging and Π-like pulse profile).
Intensity variation (electronically) …….+/-20%.
Possibility to install glass filters 50x50 mm^2 in area in front of the flash lamp.

Electronics & Computer Software

Power supply of the Simulator should be managed from a digital system of the Customer.
To connect the power supply, a GPIB or COM port can be used.
Triggering and ready-signal are TTL input and output and can be connected to a National-Instruments Connection Block.
Simulator operation is possible to be controlled via LabView digital environment.

Physical and Other

Compact design ensuring “cell-to-output” distance of 50 mm as a minimum.
Connection rod of 15 mm in diameter for fixing the lamp head in a mechanical system of the Customer.
Power supply for 220V AC, 50 Hz.
Lamp lifetime of at least 10,000 pulses.
Spare xenon bulb set of 3 spare lamps.
Installation disks for the software.
Operating instruction, diagrams, spare parts, list of replaceable components that need to be maintained (fuses, etc)

Power supply

One phase 220 V, 50-60 Hz, with maximum power consumption of 0.5 kW.

Delivery complete set

Description	Qty
Basic unit:	
• Flash illumination system with condenser	1
• Illumination system power supply	1
Software:	
• Program for automatic operation	1
Spare parts:	
• Flash bulbs	3
• Fuses	3
Technical description:	
• Instruction manual, electrical and optical diagrams, description of optical alignment techniques, recommendations on maintenance due to typical failures.	1