Golay Cells

Golay Cell is one of the most efficient devices detecting THz radiation. It has excellent sensitivity at room temperature and flat optical response over a wide wavelength range.

detectors are completely in-house manufactured and calibrated. Every model is available from stock. Delivery includes a detector head and a power supply unit. A mount for the filters can be supplied as an option.

The various THz optical components and devices (e.g. low pass filters, band pass filters, polarizers, attenuators, windows, lenses, mirrors, waveplates, spectral splitters, and beam splitters) can be supplied as a useful complement for THz applications. Please find relevant chapters at our web site.

1. GOLAY CELL GC-1P (detector with HDPE window)

2. GOLAY CELL GC-1T (detector with TPX window)
Due to polyethylene window exchange to TPX one, GC-1T detectors have a wider operation wavelength range spreading down to visible/UV. They can be considered a good substitute to Diamond window model as TPX has higher transmittance in THz than Diamond and surely cheaper than the latter one. So GC-1T model is only slightly expensive than GC-1P detector.

3. GOLAY CELL GC-1D (detector with diamond window)
Due to polyethylene window exchange to Diamond one, GC-1D detectors have a wider operation wavelength range spreading down to visible. They are usually used when not only THz and VIS ranges but also MIR is necessary. GC-1D model is a bit more expensive than GC-1T detector.

Specification:

MODEL		**GC-1P**	**GC-1T**	**GC-1D**
Application: monitoring and control of		MIR and THz radiation	UV-NIR and THz radiation	VIS-THz radiation
Material of entrance window		**High-Density Polyethylene (HDPE)**	**Polymethylpentene (TPX)**	**Diamond**
Operating wavelength range, μm		15 ÷ 8000	0.3 ÷ 6.5 & 13 ÷ 8000	0.4 ÷ 8000
Diameter of entrance cone, mm		11.0		
Diameter of entrance window, mm		6.0		
Recommended detected power, W, not more than *For higher power THz attenuators are recommended*		1×10^{-5} ATS-5-25.4, ATS-5-50.8		
Optimum modulation frequency, Hz		15 ± 5		
Noise-equivalent power @ 15Hz, $W/Hz^{1/2}$:	typical	1.4×10^{-10}		
	min	0.8×10^{-10}		
Optical responsivity @ 15Hz, V/W:	typical	1×10^{5}		
	max	1.5×10^{5}		
Response rate, ms:	typical	30		
	min	25		
Detectivity (D*) at entrance cone aperture, cm x $Hz^{1/2}$ /W:	typical	7.0×10^{9}		
	max	11.0×10^{9}		
Ambient operating pressure range, mm Hg		$760 \div 10^{-3}$		
Operational and storage temperature range, °C		5 ÷ 40		
Humidity, %		0 ÷ 80		
Vibration		avoid vibrations at 1÷100 Hz		
Rated voltage, VAC		100/115±10%, 220/230±10%		
Line frequency, Hz		50 ÷ 60		
Overall dimensions, LxWxH, mm		126x45x87		
Weight, kg		0.8		

Hardware-software Complex for Golay Cell Operation with Personal Computer

The complex is a specialized software and electronic unit connecting Golay detector with personal computer through USB interface. It is served for detecting, processing, and analyzing optoacoustical detector signals. Also the complex permits to increase sensitivity of the Golay cell based detection systems.

Main features of the complex

- no need in expensive devices for signal detecting and processing (oscillographs, spectrum analyzers and so on);
- optimal for mobile measurements out of a laboratory;
- flexible input system for calibration coefficients. This system considers all main factors which have effects on energy level determination accuracy at input of the Golay cell;
- calculates energy using calibration constants at output of the Golay cell in real-time mode;
- analyzes signal spectrum at output of the Golay cell and extracts desired signal and noise power spectrum;
- minimizes induced noise as much as possible by improving signal/noise ratio of the set in general;
- registers small signals which cannot be processed with traditional analyzing methods;
- automatically saves the measured data;
- versatile as it suits to all Golay detector models

Technical Specification

Function	- transformation of an analog signal of Golay cell to a digital signal; - analysis of the measured data; - PC output and storage of processed results.
Interface output data	USB 2.0
Data input port	BNC type
Power supply	USB 2.0/1.1 port
Indication	Power LED (green light)
Weight, kg	0.15
Overall size, mm	120 x 73 x 25
Color	Black
Required Operating System	Windows XP/7