

# Automational High Pressure Mounting (AHPM) for Complex Research of the Food-Stuffs, Biological and Physical Objects

AHPM is intended for laboratory research of the high hydrostatic pressure and temperature influence on the physical and optical parameters of solids, liquids and viscous plastic materials used in medicine, biology, chemistry, physics, food industry etc.

## Construction of AHPM:

1. Hydraulic block
2. High pressure cell (HPC) block
3. Operation block
4. Personal computer

## Measured parameters:

- Temperature
- Pressure
- Volume
- Compressibility
- Optical density



## AHPM parameters

Pressure working range	from 0 to 1000[MPa]
Temperature working range	from + 5 to + 100[°C]
Analysed object volume	up 5* [cm <sup>3</sup> ]
Diameter of HPC sample space	12 [mm]
Piston shift	30 [mm]
Working lenth of the cylindrical part of cannal	45 [mm]
Temperature registration susceptibility	0,1[°C]
Precision of the temperature registration and stabilization	± 0,5 [°C]
Pressure registration susceptibility	1 [MPa]
Precision of the pressure registration and stabilization	± 10 [MPa]

*\* in case of need, HPC with larger space volume may be made.*

Transmitting medium is silicon oil.

Analysed samples are capsuled.

Optical parameters are measured in the optical laboratory..

## Working principle of AHPM

Pressure in HPC is made automatically by the hydraulic press which transfer stress on the cell piston. The hydraulic block with pump and press regulate pressure value in the cell following personal computer commands. Reaching and stabilization of temperature in HPC is automatically.

Volume measurement is made by means of precision measurement of cell piston shift by interference method.

In the course of measurement pressure, temperature, volume, compressibility and time are registered continuously Data are recorded on-line in the form of graph and text file.

№	Real time, (h:m:s)	Temperature, (C°)	Pressure, (kbar)	Volume, (cm <sup>3</sup> )	Compressibility, (kbar <sup>-1</sup> )
1	9:56:40	27.40	0.915	4.606798	0.0859741808
2	9:56:41	27.41	0.914	4.606761	0.0860101693
3	9:56:42	27.42	0.913	4.606739	0.0862783043
4	9:56:43	27.43	0.915	4.606718	0.0859914627
5	9:56:44	27.44	0.914	4.606688	0.0863420359

## Additional information

HPC is produced in two modifications:

- with optical windows;
- without optical windows.

Any block and part of AHPM may be made separately.

Prof. Georgii Levchenko Tel:++38 062 337 96 99  
FAX:++38 062 33 90 18  
<mailto:levch@levch.fti.ac.donetsk.ua>