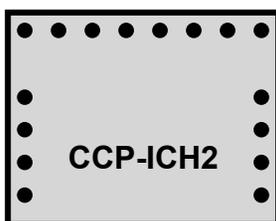

Luzchem Photoreactor Model CCP-ICH2

Luzchem's CCP-ICH2 is a fully computer controlled photoreactor certified for ICH compliance under option 2. The package includes complete sets of UVA and visible lamps, UVA/VIS Power Sensor, turntable and carousel (to equalize exposure), recessed magnetic stirrer for stress tests, bulkhead connector for gasses, safety goggles and a safe exhaust system. Computer control functions include digital timer, relative humidity sensor, temperature control, magnetic stirrer, carousel operation, and calculated exposure for compliance. This system also includes a notebook computer with easy to use CCP software pre-installed. The software features, step by step compliance tests or user defined exposures. Within user defined exposures; there are two options, manual control or automatic timer. The User Data Log allows the user to view a list of pre-recorded and saved experiments. The software operates in 'expert' mode (short menus) or in 'tutorial' mode (long menus) for training purposes.



The CCP-ICH2 photoreactor is equipped with 8 top lamps, and 8 side lamps.

Lamps: The CCP-ICH2 photoreactor package includes complete sets of UVA and visible lamps (16 of each). See separate sheet for lamp specifications.

The CCP-ICH2 package includes a UVA/VIS Power Sensor (part number LPD-CCP). This sensor is calibrated against one of Luzchem's NIST-traceable spectroradiometers.



Luzchem Research, Inc.

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Fax: (613) 749-2393
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Unit Specifications:

Dimensions:	<i>External:</i> 18" wide, 21" deep (with exhaust) and 16.5" high (46 x 53 x 42 cm) <i>Internal:</i> 12" wide, 12" deep and 8.5" high (30 x 30 x 22 cm) <i>Internal (lamps installed):</i> 11.25" x 12" x 7.6" high (28 x 30 x 19 cm)
Weight:	36 lbs. / 16 kg
Power Rating:	Standard in 110 VAC, 50/60 Hz cycle, 4 Amps Available in 220 VAC if requested at time of order Ships with North American-style power cable
Housing Material:	<i>External:</i> Stainless Steel <i>Internal (chamber):</i> Al 5052-H32 (aluminum alloy)
Ambient Temperature:	Must be between 10 °C and 40 °C
Chamber Temperature:	Temperature control standard in the range of 3-4 °C above room temperature to 50 °C
Humidity:	Must be between 0% and 95% (non-condensing)

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Options Included:

Option	Specifications
Notebook	<ul style="list-style-type: none">• CCP Software pre-installed and ready to use• PC running on Windows 7 or better• USB connected to CCP-ICH2 photoreactor
Temperature Control	<ul style="list-style-type: none">• Operating temperature (ambient) must be between 10 °C and 40 °C• Display: computer control• Min. set temperature: 3 °C above room temperature• Max. set temperature: 50 °C
Built-in Drive	<ul style="list-style-type: none">• Can support the Luzchem carousel and turntable• Speed: 7 RPM
Carousel	<ul style="list-style-type: none">• Can hold test tubes of up to 16 mm in diameter.• Diameter: 5"• Bottom plate height: 1 in. above chamber floor• Can hold 16 tubes
Turntable	<ul style="list-style-type: none">• Diameter: 9 3/16 mm• Height: 1 in. above chamber floor
Magnetic Stirrer	<ul style="list-style-type: none">• Speed: adjustable• Min speed: 100 RPM• Max speed: 1000 RPM• Max volume that can be stirred: 0.26 gallons (1L)• Stirring magnet not included• Not for use simultaneously with sample carousel or turntable
Timer	<ul style="list-style-type: none">• Software controlled
Gas Inlet	<ul style="list-style-type: none">• Rear mounted bulkhead gas connector• Only recommended for non-flammable, non-toxic gases• Gas should not dissipate in the chamber, should be used with environmental chamber or user supplied unit.
Hour Meter	<ul style="list-style-type: none">• Built-in to the unit• Keeps track of the number of hours the unit has been in operation
Safe Exhaust	<ul style="list-style-type: none">• Material: Steel• Aluminum exhaust tube provided: 4" diameter, max length: ~ 8'• Built-in fan: auto. control (max speed: 3100 RPM, airflow: 110 CFM)
Safety Interlock	<ul style="list-style-type: none">• Turns off lamps when door is open• Indicator LED's signal if the door is open and if power is running to the lamps
UV Protecting Goggles	<ul style="list-style-type: none">• Yellow safety goggles, with 400 nm long pass cut-off

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LPD-CCP Power Sensor

LPD-CCP	Specifications
Calibration	<ul style="list-style-type: none">• Calibrated against a NIST-traceable Luzchem spectroradiometer (SPR-4001)• Valid for one year from date of calibration
Calibrated for use with Luzchem lamps*	<ul style="list-style-type: none">• LZC-VIS• LZC-UVA• LZC-UVB• LZC-UVC• LZC-420 <p>*Lamp types cannot be mixed for calibration to apply</p>
Measurement units	<ul style="list-style-type: none">• mW/m^2 for the selected wavelength region• calculated by CCP software
Accuracy	<ul style="list-style-type: none">• $\pm 15\%$ (+/-10% of SPR values)
Connectivity	<ul style="list-style-type: none">• connects directly to CCP photoreactor chamber
Power requirements	<ul style="list-style-type: none">• 5V DC, supplied by CCP unit
Dimensions	<ul style="list-style-type: none">• 4 x 3 x 1 inches (approximate)
Weight	<ul style="list-style-type: none">• 110 g (approximate)

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Software:

Photoreactor Control:

The screenshot shows the 'Photoreactor Control' software interface. It features several key sections:

- D. Select Device:** Includes 'Mode of Operation' set to 'Timer', 'Recall Previous Settings', 'Go', and 'Go After Warm Up' buttons. It also has input fields for 'Hours' (0), 'Minutes' (1), 'Seconds' (0), and 'Desired Temperature' (24 °C).
- A. Photoreactor Settings:** Contains 'Carousel' and 'Stirrer' toggle switches, a 'Stirrer Speed' slider (0 to 5), and 'Lamp Control' for four lamps (A, B, C, D) with their respective 'Number of Lamps Installed' (2, 6, 4, 4).
- B. Spectrum Representation:** A graph showing 'Power - mW m⁻² nm⁻¹' vs 'Wavelength, nm' from 300 to 800 nm. The spectrum shows peaks in the UV and visible regions.
- C. Environmental Monitoring:** Displays 'Actual Temperature' (24 °C), 'Relative Humidity' (48 %), 'Vis Meter' (1375 mV), and 'UV Meter' (1384 mV).
- Other Controls:** Includes 'Time Set' and 'Time Remaining' (both 00:00:00), 'Store Power', and 'Irradiance' buttons.

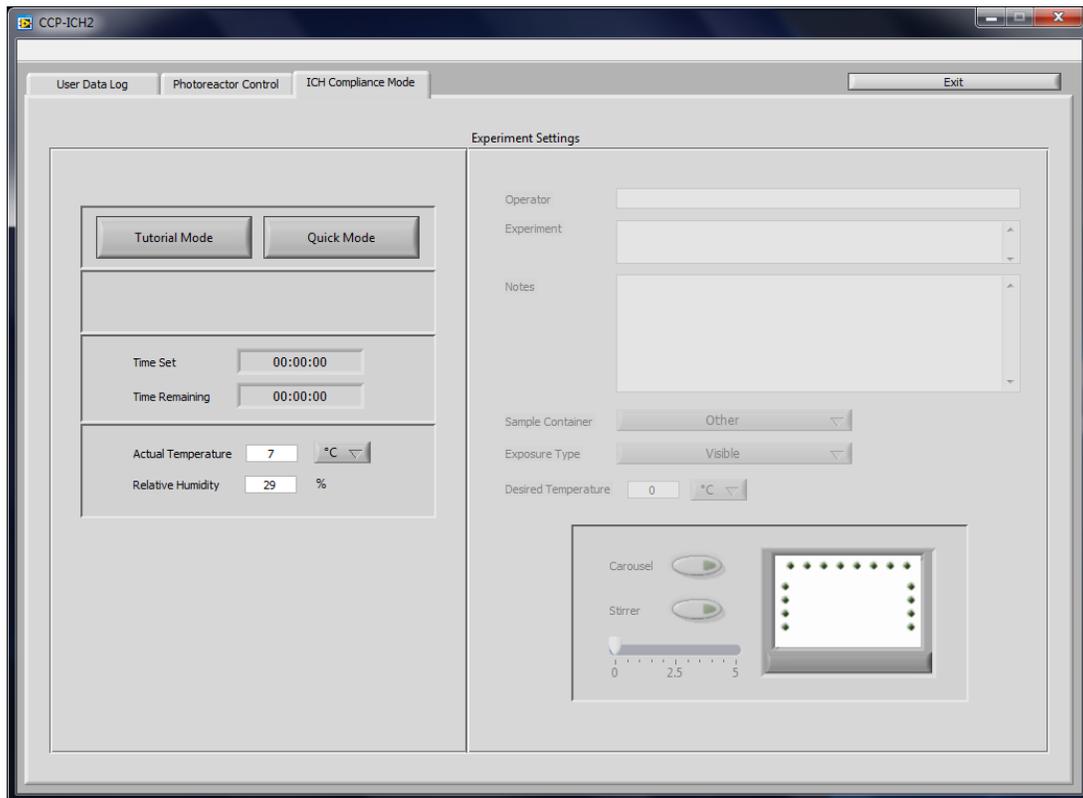
- A. The lamps can be turned on and off using the switches in the *Photoreactor Settings* box, and the stirrer and carousel/turntable can be turned on or off with the toggles.
- B. Selecting the lamp type will display the irradiance spectrum for these lamps in the chart.
- C. The CCP-ICH2 photoreactor is also equipped with temperature control between ambient temperature and 40°C, and relative humidity (RH) monitor, which displays the temperature and RH inside the chamber at all times.
- D. In Timer mode, the irradiation parameters can be set using the switches and dials in the *Photoreactor Settings* box (the lights and motors will only be turned on when the timer countdown is started).

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ICH Compliance Mode:



- Software prompts user to install correct lamps for ICH compliance, to warm up the system, and to take a power reading
- Software calculates time required for ICH compliance testing and logs the parameters of the experiment.

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User Data Log:

CCP-ICH2

User Data Log | Photoreactor Control | ICH Compliance Mode | Exit

Experiment ID	Experiment Name	Operator	Lamp Type
20120710 / 1141	Manual mode	Luzchem	Visible
20120710 / 1149	Timer test 1	Luzchem 1	Visible
20120710 / 1324	ICH Compliance test 1	Luzchem 1	Visible
20120710 / 1406	ICH test 2 new calibration	Luzchem 1	Visible
20120710 / 1517	ICH test 3 new cal	Luzchem 1	Visible
20120710 / 1709	uva	vero	UVA
20120723 / 1451	ICH - UVA EXPOSURE	Luzchem 1	UVA
20120723 / 1456		Luzchem 1	UVA
20120723 / 1537	UVA - manual mode - ICH time	Luzchem 1	Other
20120723 / 1556	ICH UVA time	Luzchem 1	UVA

Delete Entry | Print Report

Experiment ID: 20120723 / 1451 | Aborted ●

Experiment: ICH - UVA EXPOSURE

Operator: Luzchem 1

Type of Lamps: UVA | Exposure Time: 00:00:48 | Start temperature: 26 °C | Vis Power: 1 W/m²

of lamps in use: 10 | Sample Container: Quartz | End temperature: 26 | UVA Power: 20 W/m²

A B C D
● ← ● ● ↑ ●

Carousel Off | Start Humidity: 45 | UVB Power: 0 W/m²

Stirrer Off | End Humidity: 45 | UVVC Power: 0 W/m²

Description:
Sample 7, batch 3

- The irradiation parameters and lamp type for each timed experiment will be recorded in the User Data Log, as well as any additional information entered in the data log information boxes.

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