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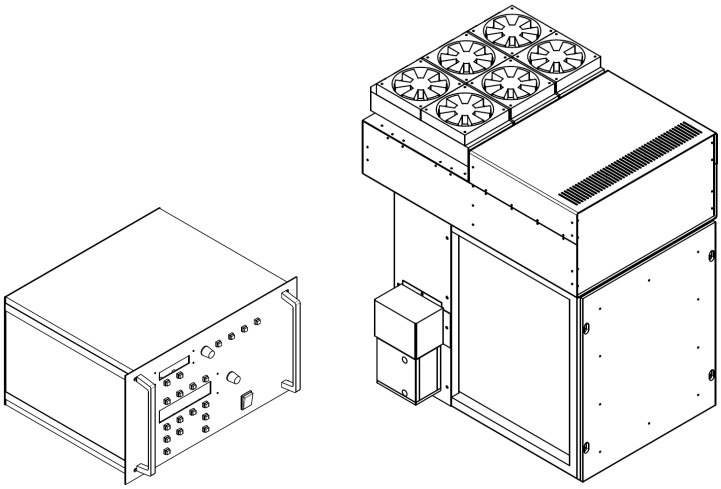
Coater 5 AC specification sheet

The AC version of Coater 5 coating device is equipped with temperature and humidity control system. Stable environment conditions are therefore provided during whole coating process. Device consists of control unit mounted in 6U high 19" rack case and a coating box. Coating box has removable front cover with four bayonet locks.



Dip coating mechanism

Linear positioning mechanism consists of one axis linear guide with carriage driven by precision screw. Linear guide uses two stainless steel rods and carriage with sealed linear ball bearings. Carriage is driven by lead screw with anti-backlash nut. It provides excellent smoothness and precision of motion. Mechanism is powered by dc servo motor with incremental encoder. Servo motor driver uses encoder position feedback to achieve precise motor speed as well as travel distance metering.

Sample holder is attached to carriage typically by two screws and is easily removable. Carriage has a set of threaded holes to accommodate various sample holders. Standard holder is designed for holding up to ten microscopic glass slides. Holder for different shapes of samples could be provided on request.

Control system

All experiment parameter are user adjustable using buttons and knobs on the control panel. These parameters include downwards carriage speed, upwards carriage speed, upper point delay, bottom point delay, upper point position, bottom point position, manual motion carriage speed, park position and experiment mode. There are three experiment modes available. Simple mode executes whole dipping cycle on a single button press. Automatic mode performs the whole dip coating process cycle automatically with preset parameters without a little user intervention. Manual mode allows performing dipping cycle step by step as required by user.

Device can be also controlled from a personal computer connected via USB or serial port RS232.

Environment control system

The environmental control system keeps the temperature and humidity on constant values set by the user. Conditioning system is a close-loop type with recirculation of the air in the coater chamber.

The temperature control uses Peltier thermoelectric heater / cooler assembly together with electronic regulator to achieve constant temperature in the chamber. The base unit consist of fan and manifolds circulating the air through heat exchanger. The exchanger is held on appropriate temperature by Peltier heating / cooling block equipped with second heat exchanger and fan dissipating the excess heat to ambient.

Humidity is controlled by second Peltier thermoelectric heater / cooler assembly and small steam generator. Excessive water is condensed off on the Peltier block maintained at desired dew point and drained out to waste water reservoir. Humidity is added to the environment by ultrasonic cold steam generator which evaporates distilled water from reservoir in a controlled manner.

Both temperature and relative humidity are measured, displayed and used for regulation loops. The control electronics is added to the basic device's electronics as well as Peltier power supplies. Besides the regulation loops for temperature and humidity the protective functions are implemented to avoid overheating and/or overloading of Peltier elements.

Specifications

Motion control	speed range	mm/min	1..300
	resolution	mm/min	1
	accuracy	mm/min	0.01
Position range	max. displacement	mm	200
	resolution	mm	1
	accuracy	mm	1
Sample	sample holder clearance	mm	100
	max. sample weight	g	150
Chamber dimensions	length	mm	300
	width	mm	300
	height	mm	400
Humidity control	range	% RH	10..90
	resolution	% RH	1
	accuracy	% RH	± 2
Temperature control	range	°C	10..40
	resolution	°C	1
	accuracy	°C	± 1
Communication	computer control link 1	-	USB
	computer control link 2	-	RS232
Materials	coating box and covers	-	acrylic (plexiglass)
	frame	-	AISI 304 stainless steel
	carriage and rails	-	AISI 304 stainless steel
	heat exchangers	-	anodised aluminium alloy
Power supply	voltage	V	230, 50Hz
	power	W	max 1200