

COMPACT SAMPLE PREPARATION UNIT WITH INTEGRATED COLDBLOCK[™]

AUTOMATED ACID DISPENSING AND SAMPLE DIGESTION IN A COMPACT FOOTPRINT

INTRODUCTION

Nucomat and ColdBlock[™] joined forces to create a new product: The CSPU with integrated ColdBlock[™].

The ColdBlock[™] technology is used for rapid sample digestion. Adding the unit into an automated acid dispenser gives your mining laboratory the advantage you are looking for!

The **compact sample preparation unit** is a mobile laboratory instrument that includes pneumatically operated refill pumps for endless operation from a **remote bulk container**.



HIGHLIGHTS

- ACCURATE AND FAST LIQUID DISPENSING
- GRAVIMETRIC CONTROL
- MODULARITY
 - 1 TO 4 REAGENTS
 - INTEGRATED COLDBLOCK[™] WITH COOLER FOR INFRARED DIGESTION
- HIGHLY RESISTANT TO CONCENTRATED ACIDS
- USER CONFIGURABLE
- LIMS INTERFACING
- SAFE OPERATION
- AUTOMATIC REFILLING FROM BULK CONTAINERS

ACCURATE AND FAST LIQUID DISPENSING WITH GRAVIMETRIC CONTROL

- An integrated balance with a resolution of 10 mg assures that the right amount of acid is dispensed in every step of the method.
- For improved sample integrity the unit can be configured for tube per tube operation at a lower throughput.

MODULARITY

The base unit is a single acid dispenser with integrated balance. Up to three additional liquids can be added.

In case the unit needs to be expanded, the installation of an additional liquid is plug & play and can be done on-site by the customer.

ColdBlock™ digester

Infrared lamps are used because of some properties that traditional hotplates simply cannot offer:

- High power for fast heating up to 300 °C
- Instantly on, meaning no start-up delay
- Instantly off, enabling accurate digestion time
- Power control for syrupy state digestion
- Ability to use different power levels in different method steps
- By adding a cooling the sample will not be boiling over

CORROSION RESISTANT DESIGN

The device is designed to be used with concentrated acids, more specifically a lot of attention was paid to corrosion resistance of all used materials:

- Fume hood constructed in PVC
- Refill pump and dispensing valves:
 - Air operated
 - PFA body parts
 - All wetted parts made from PTFE

USER CONFIGURATION

A web based user interface is provided with the unit to enable the operator to view the status of the device and to configure the operation to their needs.

CSPU

nucomat

The screenshot displays the CSPU web interface. At the top, it shows 'Current weight [g]: 0', 'Servo position [10-1mm]: 2', and 'Device status: DONE'. The user is logged in as 'admin'. The navigation menu includes 'Home', 'Method editor', 'Calibration', 'IO', 'Configuration', 'Data', and 'Login'. There are 'Alerts 0' and a confirmation message 'All is well, no alerts here!'. The 'Sample rack' section shows a 6x4 grid of 24 positions. Below it, three liquid reservoirs are shown: H2O (13.28 kg), HNO3 (12.65 kg), and HCl (11.62 kg). The 'Active operation' section includes a 'Method:' dropdown, a 'Number of samples:' input field, and three buttons: 'Import sample info', 'Start', and 'Mute beeper'.

Method editor

Method name: Aqua regia digestion Choose Method ▾

	Action	Weight validation	Reagent	Volume [mL]		
1	Dispense ▾	Enable ▾	HNO3 ▾	10	✗	
2	Dispense ▾	Enable ▾	HCL ▾	30	✗	
	Action	Control type	Power ch1 [%]	Power ch2 [%]	Time [s]	
3	Digest ▾	Power ▾	70	70	1200	✗
	Action	Reagent	Volume [mL]	Density [g/l]		
4	Make to volume ▾	H2O ▾	100	1050	✗	

Download saved methods Upload methods Save method

The method editor can be used to build or modify user specific methods.

OPERATION

After configuration using the web interface, the device is ready for operation. Different methods can be built and stored in the editor. After selecting the amount of samples and the desired method the sample preparation can begin with a simple click in the web interface.

However, if your lab needs the system to be integrated into your workflow and commanded via your LIMS system, a REST API is provided that allows full control from external software platforms.

SAFETY



BULK ACID CONTAINERS

Each acid container that is connected to the unit can contain a volume of 2 liters of acid. An integrated refill pump enables the device to work with remote bulk containers, potentially stored outside. The device monitors the liquid level inside the container and automatically refills it when needed. This avoids the need to manipulate heavy and dangerous acid barrel inside your laboratory.

BENEFITS FOR YOUR LABORATORY

The main advantages of this automated system are:

- Excellent accuracy and precision, gravimetrically verified
- Improved safety
- High speed performance
- Budget friendly
- Reduction in acid consumption due to the ColdBlock™ technology

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