

nucomat

COMPACT SAMPLE PREPARATION UNIT

AUTOMATED ACID DISPENSING AND SAMPLE DIGESTION IN A COMPACT FOOTPRINT

INTRODUCTION

Nucomat, a laboratory automation specialist for several decades, presents a modular unit for multiple **acid dispensing** and **sample digestion** enabling **simple** push button **operation**. 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
 - OPTIONAL INTEGRATED INFRARED DIGESTION
- COMPATIBLE WITH MULTIPLE RECIPIENTS AND RACKS
- LEACH CAPS FOR REFLUX OPERATION
- HIGHLY RESISTANT TO CONCENTRATED ACIDS
- USER CONFIGURABLE
- SINGLE BUTTON OPERATED
- LIMS INTERFACING
- SAFE OPERATION
- AUTOMATIC REFILLING FROM BULK CONTAINERS

ACCURATE AND FAST LIQUID DISPENSING WITH GRAVIMETRIC CONTROL

- In batch mode a rack of up to 40 tubes can be filled with concentrated acids with an accuracy of ± 20 mg in only a couple of seconds¹.
- 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. It can be equipped with an infrared hotplate for sample digestion and up to three additional liquids.

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.

INFRARED DIGESTION PLATE

Infrared was chosen 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

¹ 5ml of water was dispensed in 40 tubes in 45 seconds.

RECIPIENTS, RACKS AND LEACH CAPS

The unit can be configured for use with 4 standard types of recipients.



- 20 ml glass tubes in a 4x10 rack
- 50 ml glass or PTFE beakers in 2 [5 x 4] racks for a total size of [5 x 8]
- 100 ml glass or PTFE beakers in 2 [5 x 3] racks for a total size of [5 x 6]
- 250 ml glass or PTFE beakers in 2 [4 x 2] racks for a total size of [4 x 4]

Upon customer request the unit can be customized for usage of a different type of recipient.

For all standard beakers Nucomat provides the possibility to use our patented leach caps to reduce evaporation during digestion and reflux operation. With these leach caps the evaporation can be reduced to a similar level as with watch glasses but they are designed to enable the device to dispense through the cap to avoid the need to remove them manually in the middle of the process. Additionally, the cap is made in such way that the surface of the beaker is washed down with the dispensed liquid.

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 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.

Method editor

Method name:

Step	Description	HNO3 [mg]	HCl [mg]	HClO4 [mg]	H2O [mg]	
1	Dispense	<input type="text" value="5000"/>	<input type="text" value="15000"/>	<input type="text" value="3000"/>	<input type="text" value="0"/>	<input type="button" value="X"/>
2	Digest	<input type="text" value="80"/>	<input type="text" value="900"/>	<input type="button" value="X"/>		
3	Cool	<input type="text" value="300"/>	<input type="button" value="X"/>			
4	Make to mass	<input type="text" value="100000"/>	<input type="button" value="X"/>			

OPERATION

After configuration using the web interface, the device is ready for simple operation: put the sample rack inside and push the start button.

However, if your lab needs the system to be integrated into your workflow and commanded via your LIMS system, a web 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
- Compatible with different standard or customized sample racks
- Budget friendly

TAILOR-MADE SOLUTIONS

Nucomat builds turnkey automated systems based on your requirements (capacity, type of recipients, ...).

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