RADIOISOTOPES PRODUCTION IN SAFETY CONDITIONS AND IN A FULLY AUTOMATED WAY
The series consists of a family of machines configurable according to various parameters, such as:

- the type of isotope
- the specific isotopes to be produced
- use of “disposable cassette”
- upgrade possibility
- the type of process chosen for the production of several isotopes: Mixed or Separated (Mixed: several production processes are carried out from the same configuration; Separated: each production process has its specific configuration)

The radioisotopes that can be produced are $^{64}$Cu, $^{89}$Zr, $^{68}$Ga, $^{124}$I, $^{123}$I.

Are you considering other alternatives? Alternative systems are usually composed of a cyclotron, cells, and modules. These offer many disadvantages:

- Target positioning in the cyclotron happens inside the bunker, and after irradiation the target is recovered by entering the bunker and positioning it manually inside the cell.
- Many of the operations that must be performed during the process are manual, using gloves or with tele-pliers, with substantially less operator comfort.
- Different systems must be used to produce different radioisotopes, so as not to risk cross-contamination.

The Comer solution
The complete ALCEO configuration features a single PTS unit and a Cooling System unit: the transport of the target to the corresponding module is performed via a target switch. The radionuclides produced are available in a form suitable for radiopharmaceutical synthesis. The integrated system allows all the operations to be carried out without manual operator intervention.

Do you want to avoid cross-contamination? The disposable-cassette operating mode allows you to separate the isotopes produced on the ALCEO module. In this operating mode, the risk of cross-contamination is fully removed, regardless of the operating procedures applied.

Do you want a flexible and independent target irradiation unit? The ALCEO system is designed for commercial cyclotrons with energy ranging between 5 and 30 MeV. The target irradiation unit can be installed on different configurations: unshielded cyclotron, self-shielded cyclotron and external beam line. In addition, ALCEO has an independent cooling system that provides target cooling during irradiation.

New

$^{68}$Ga production
Install in laboratories with no solid target preset.
State of the art features

- Stainless steel AISI 316L enclosure with external Scotch-Brite and internal Mirror-Brite
- Laminar airflow on working area with highest recirculation rate
- Integrated VPHP generator
- Peristaltic pump
- Liquid waste container (circuit internally sanitizable)
- Viable and non viable monitoring system (circuit internally sanitizable)
- Anemometer
- Humidity and temperature sensor
- HEPA H14 filters on inlet
- Glove extenders
- 7” widescreen HMI with user-friendly interface including USB and ethernet port

Further options

- AGT onboard
- Rapid transfer port (RTP)
- VPHP concentration sensors low/high level
- HEPA H14 filters on outlet
- Filtration manifold
- SCADA
- Paperless graphic recorder
- Operation with positive/negative pressure
- Others on request

Technical data

<table>
<thead>
<tr>
<th>Material</th>
<th>AISI 316 L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shell structure</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Stainless steel finish</td>
<td>external: Scotch-Brite</td>
</tr>
<tr>
<td></td>
<td>internal: Mirror-Brite</td>
</tr>
<tr>
<td>Air classification</td>
<td>Main chamber class A (after decontamination)</td>
</tr>
<tr>
<td></td>
<td>Pre-chamber class A (after decontamination)</td>
</tr>
<tr>
<td>Working internal pressure</td>
<td>Main chamber 50-100 Pa</td>
</tr>
<tr>
<td></td>
<td>Pre-chamber 25-50 Pa</td>
</tr>
<tr>
<td>Filters</td>
<td>Main chamber H14 inlet and outlet</td>
</tr>
<tr>
<td></td>
<td>Pre-chamber H14 inlet and outlet</td>
</tr>
<tr>
<td>Make up air flow rate</td>
<td>732 m³/h</td>
</tr>
<tr>
<td>Overall dimensions</td>
<td>3750 x 1050 x 2500 mm</td>
</tr>
<tr>
<td>Internal dimensions</td>
<td>2000 x 525 x 730 mm</td>
</tr>
<tr>
<td></td>
<td>800 x 525 x 730 mm</td>
</tr>
<tr>
<td>Net weight</td>
<td>1730 kg</td>
</tr>
</tbody>
</table>

Utilities requirements

- Compressed air 6 bar, 25 nL/min
- Power supply
  - Isolator 230V (1Ph+N+PE) 50/60Hz 32A TN-S
  - VPHP generator 230V (1Ph+N+PE) 50/60Hz 25A TN-S
- Installed power 8900 W

All data refer to the configuration "MSTI: VPHP+CHAMBER 2000+PRECHAMBER 800L"