



ION-12SC CYCLOTRON SYSTEM

Data Sheet

SYSTEM OVERVIEW

The IONETIX ION-12SC Cyclotron is a 12 MeV, superconducting cyclotron that accelerates protons to produce millicurie levels of positron emitting isotopes to be used for the production of radiopharmaceuticals for Positron Emission Tomography (PET) imaging.

It offers simple, fast N-13 ammonia production for just-on-time dose manufacturing to meet the needs of your fast and flexible imaging center.

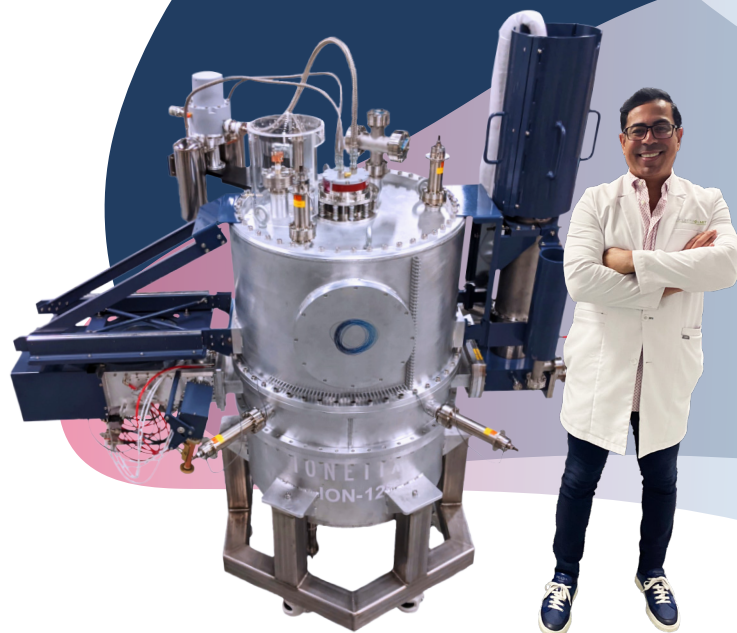
The ION-12SC's ultra-compact footprint allows it to be installed in sites where most other cyclotrons are not possible, allowing dose production to happen closer to the scanner than previously achievable.

Benefits at a Glance

- Simple to use, routine production in only three button presses
- Optimized for fast, repeated irradiations

OPTIONS AND ADD-ONS

- Additional Touchscreen HMI
- ION-Shield Vault Solution



PERFORMANCE

Daily cyclotron startup time is only 10 minutes from idle to run state.

No daily tune up required for optimal beam performance.

Isotope Production

Isotope	Nitrogen-13
Nuclear Reaction	O-16 (p, α) N-13
Chemical Form	[N-13] Ammonium ion
Target Material	Aluminum 6061
Window Material	Aluminum 6061
Target Volume	3.5 mL
Yields	50 mCi (1.85 GBq) in 10 minutes at 10 μ A
	70 mCi (2.59 GBq) in 20 minutes at 12 μ A



magnet spiral sections



internal liquid target

KEY COMPONENTS

Ion Source

- Internal Penning Ionization Gauge
- Proton generating

Radio Frequency

- 6,000 W, water cooled amplification system
- 70-megahertz acceleration frequency

Magnet

- Superconducting magnet
- Cryogenic System (liquid cryogen free)
- Compressed helium cooling
- 4 K operating temperature

Vacuum

- Two stage: scroll pump and turbomolecular pump
- Vacuum level in the microTorr range

Targets

- Internal liquid filled targets
- Water cooled

Control System

- Touch screen interface
- Fully automated production operation

OPERATOR MAINTENANCE

The ION-12SC System design is optimized for fast change out of the most common maintained components, the target and the ion source.

Target remove and replace under 30 minutes, beam to beam.

Ion Source remove and replace under 50 minutes, beam to beam.

SITE REQUIREMENTS AT A GLANCE*

Cyclotron and Equipment Space

- Floor Space: 350 – 500 square feet (32.5-46.5 square meters)
- Minimum Ceiling Height: 10 feet (3.1 meters)

Power

The ION-12SC Cyclotron System must be supplied with 208 Volts (AC, nominal), three phase power at 50 or 60 Hz.

Cyclotron support equipment requires either 208 Volts or 460 Volts (AC, nominal), three phase power at 50 or 60 Hz, and 100-240 Volts (AC, nominal) single phase power at 50 or 60 Hz.

Key Component Weights

- Cyclotron: 4500 pounds (2040 kilograms)
- ION Shield Vault (if required): 120,000 pounds (54,450 kilograms)
- IONETIX N-13 Shielded Cabinet (*if purchased*): 3600 pounds (1630 kilograms)
- IONETIX N-13 Shielded Laminar Flow Hood (*if purchased*): 4600 pounds (2090 kilograms)
- IONETIX F-18 Shielded Double Cabinet (*if purchased*): 15000 pounds (6800 kilograms)
- IONETIX F-18 Shielded Laminar Flow Hood (*if purchased*): 8000 pounds (3630 kilograms)

*For detailed site preparation information, please refer to the Site Planning Guide for the ION-12SC Cyclotron System, document 103499.01.

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Printed in the United States of America.

000000.01 Rev. 01

Contact Us: IONETIX Corporation
3130 Sovereign Drive
Lansing, Michigan 48911
United States of America

+1.517.252.4069
n-13ammonia@ionetix.com

www.ionetix.com