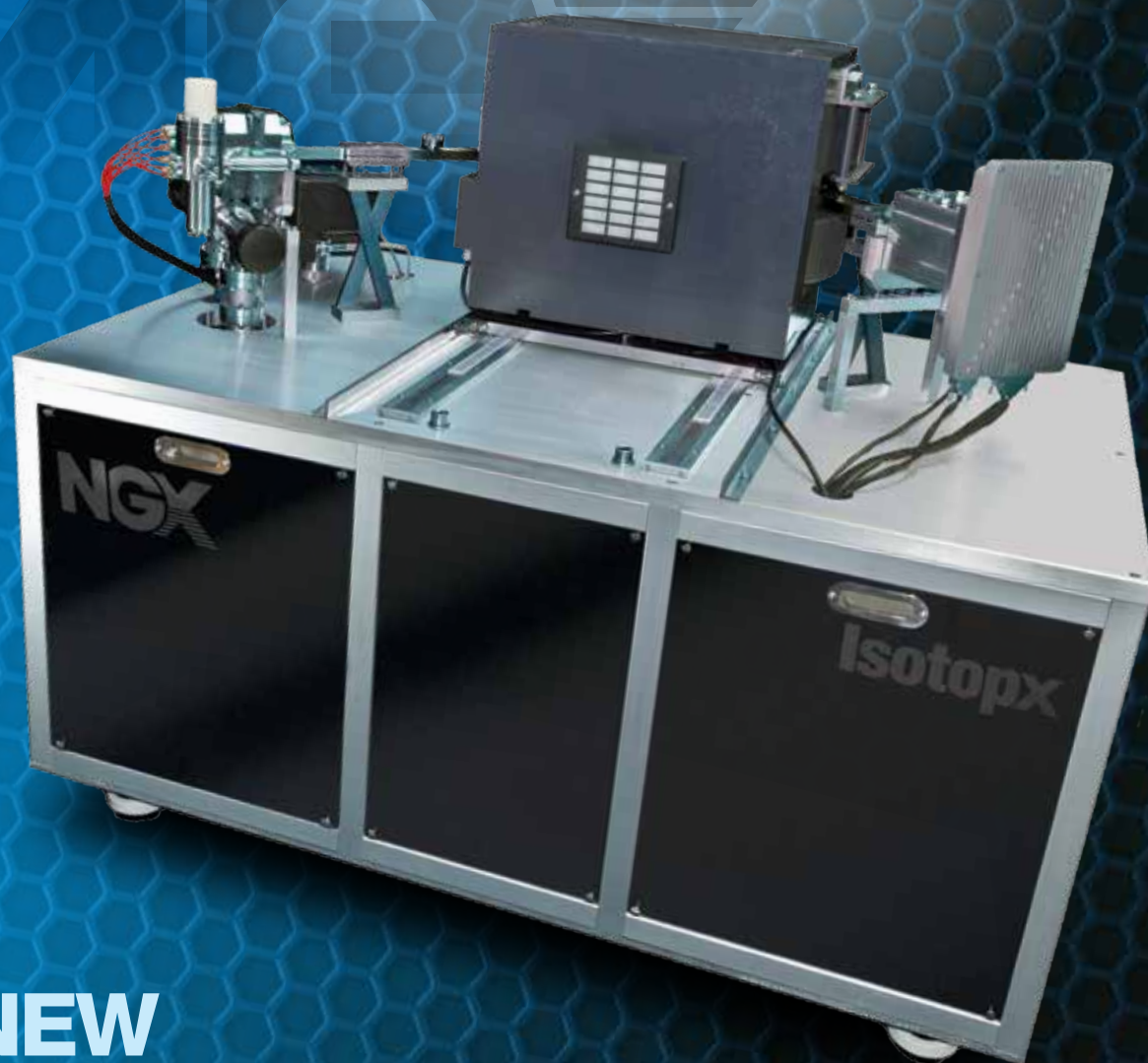


Isotopx

# NGX



**A NEW  
MULTI-COLLECTOR  
NOBLE GAS  
MASS SPECTROMETER  
FROM ISOTOPX**

# ISOTOPX ANNOUNCE NGX

## A NEW MULTI-COLLECTOR MASS SPECTROMETER FOR ISOTOPE RATIO MEASUREMENT OF NOBLE GASES

NGX offers state-of-the-art performance but preserves the simplicity in operation of previous generation noble gas instruments.

### COLLABORATIVE DESIGN

Prior to designing NGX, Isotopx undertook a detailed consultation within the noble gas community. Our aim was to gain an understanding of the needs of noble gas geoscientists and their thoughts on what an ideal mass spectrometer would look like. Three factors emerged and became the blueprint for NGX:

- Low volume/high sensitivity
- Straightforward operation
- Versatile collector design

### LOW VOLUME MULTI-COLLECTOR

NGX uses an asymmetrical ion optical geometry where the magnet shortens the image length of the ion beam allowing a significantly shorter flight tube.

This keeps the internal volume as low as possible - less than 800 cc for an argon configuration consisting of 5 Faradays and a multiplier.

The powerful magnet and 54 cm geometry (the same as the VG 5400) provide sufficient resolution and dispersion to analyze all of the noble gases. The magnet is based on a design taken from our successful Phoenix TIMS instrument where it routinely operates up to mass  $m/z$  270.



### STRAIGHTFORWARD OPERATION

NGX uses a fixed multi-collector with the collector spacing set during construction to match the individual needs of each user. The result is a mass spectrometer optimized for multi-collection of one noble gas that can be used for all other noble gases in peak jumping mode.

Use of a fixed multi-collector greatly simplifies instrument construction, lowers the collector volume and increases effective sensitivity. It also greatly simplifies instrument operation since no zoom lens or movable optics are required.

NGX incorporates automatic valves allowing full automation of analysis.

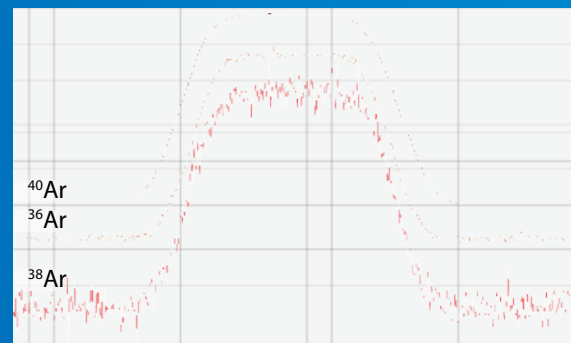
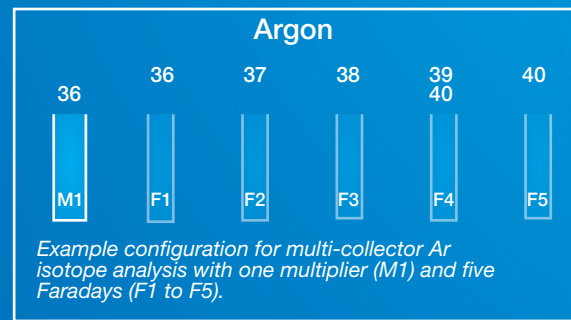
# VERSATILE MULTI-COLLECTOR

The multi-collector can be configured in a variety of formats depending on the expected instrument workload.

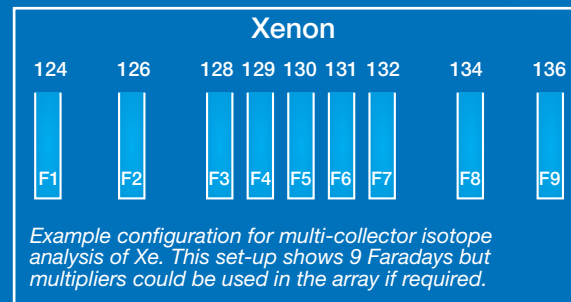
A typical argon configuration consists of five Faraday buckets with an ion counting multiplier to count  $^{36}\text{Ar}$  on small samples. This would produce an instrument optimized for multi-collector argon isotope analysis but which could be used in peak jumping mode for any of the other noble gases including helium.

Alternatively, the collector could be configured with nine Faradays optimized for xenon isotopes or a very low volume system could be constructed using a single Faraday and a single multiplier allowing collection of any of the noble gases in peak jumping mode at very high sensitivity.

NGX's versatile collector design can accommodate either Faraday detectors or ion counting multipliers. The ultimate mix will depend on user requirements but for example a five collector argon system could be built consisting of a user defined mix of multipliers and Faradays or even with multipliers in all positions.



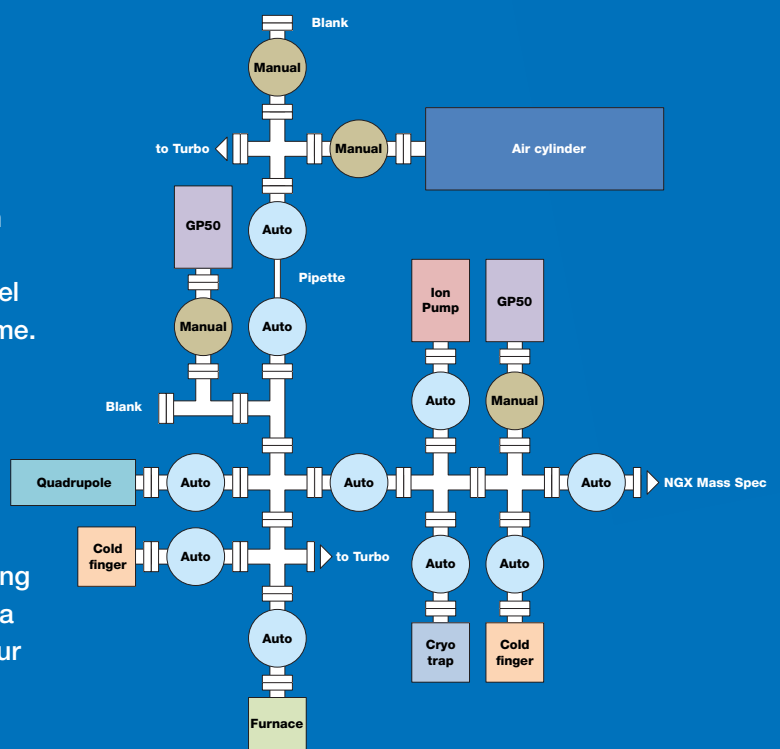
Ar coincidence



# NGX SAMPLE PREPARATION AND CLEANUP

Isotopx can supply extraction lines for preparation and clean-up of noble gas samples or standards. Extraction lines are constructed from stainless steel and are designed with extremely low internal volume. All lines are under computer control and can be baked to ensure a high degree of cleanliness.

A high level of customization is possible on extraction lines and Isotopx work closely with the end-user to agree the final specification. The schematic shows an example specification including vacuum system, automatic valving, a furnace and a quadrupole leak check. Please talk to us about your specific requirements.



# PROVISIONAL SPECIFICATIONS

## Mass range

1 – 200 Daltons at 8kV accelerating voltage

## Background

$5 \times 10^{-14}$  cc STP at m/z 36

## Sensitivity

Argon :  $> 1 \times 10^{-3}$  amps/Torr at 200 $\mu$ A trap current

Helium :  $> 2 \times 10^{-4}$  amps/Torr at 800 $\mu$ A trap current

## Abundance Sensitivity

1ppm at  $10^{-7}$  Torr (defined as the relative contribution of  $^{40}\text{Ar}$  at m/z 39)

## Static Volume

~800cc (6 Faradays/Multipliers configured for Ar)

## Rate of rise

$< 1 \times 10^{-12}$  cc STP/min for  $^{40}\text{Ar}$

## Resolution

Faraday :  $> 600$

Multiplier :  $> 600$

## Peak side stability

$< 25$ ppm in mass over 30 min

## Amplifier response

$1 \times 10^{11} \Omega$  Signal decay of  $< 5$ ppm of 8 volts in 2 seconds

$1 \times 10^{12} \Omega$  Signal decay of  $< 5$ ppm of 5 volts in 4 seconds

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