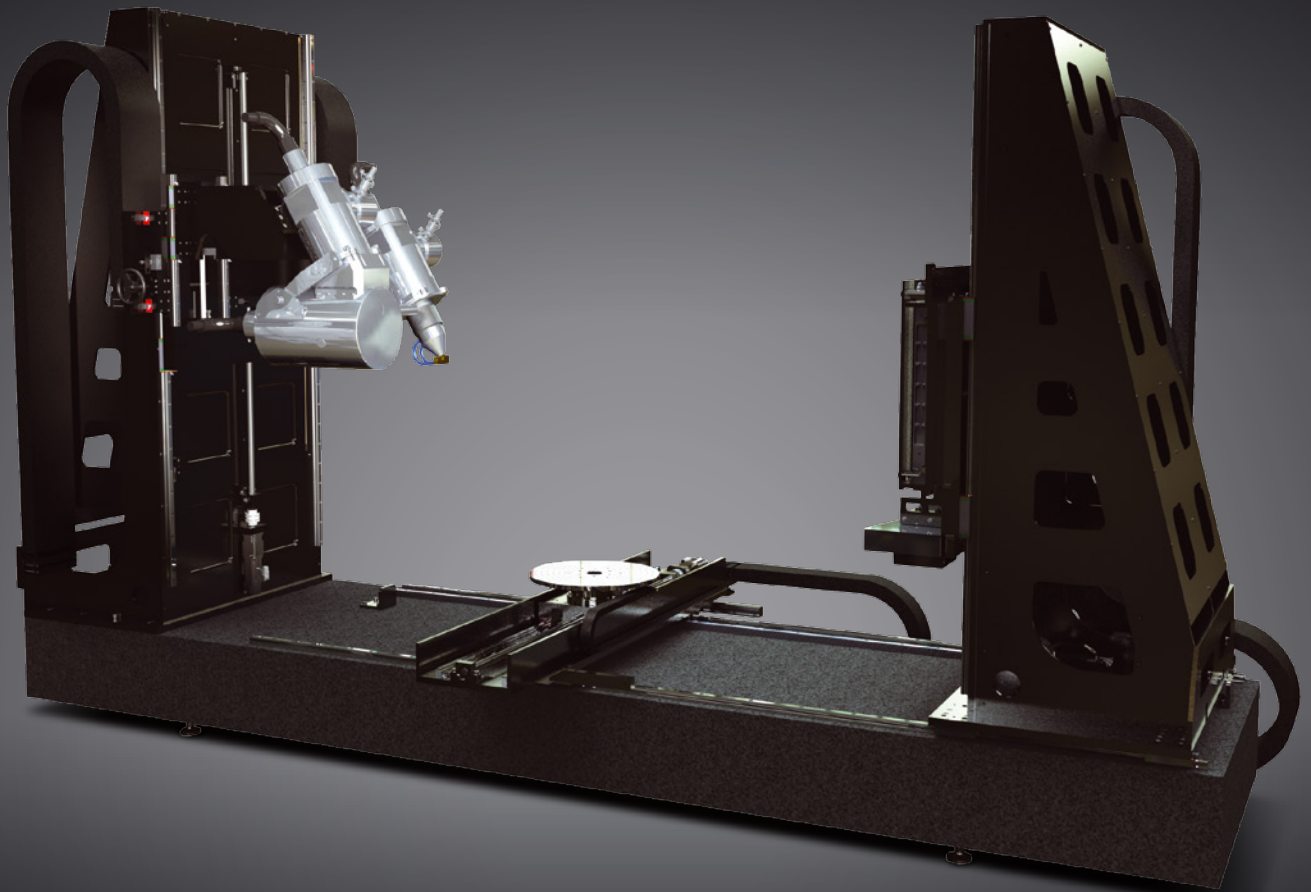




# CONFIGURABLE CT SYSTEMS



**CT** VERSATILITY

Nikon  
*100<sup>th</sup>*  
anniversary

NIKON METROLOGY | VISION BEYOND PRECISION



# VERSATILITY IS THE SUM OF DETAILS

## THE FASTEST INSIGHT INTO THE INSIDE

In a production environment where a fast solution to a problem is essential, internal material defects, complex assemblies and hidden geometry can all be too demanding and time consuming for traditional destructive inspection methods.

Nikon Metrology's X-ray CT provides fast, accurate and non-destructive 3D analysis of complex parts to meet all inspection requirements.

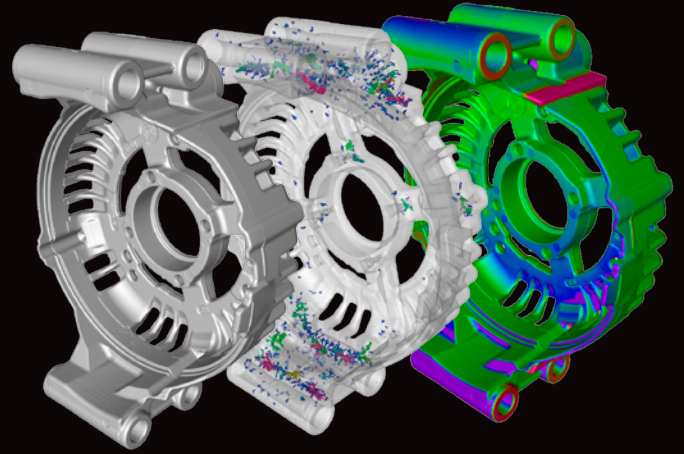
Nikon Metrology's cutting-edge microfocus X-ray sources provide a highly-focused X-ray spot for unmatched geometric magnification and image fidelity. With microfocus sources ranging from 160 kV to 450 kV, this technology opens the door to a new world of detail, accuracy and insight.

## MICROFOCUS ACCURACY FOR A WIDE SPECTRUM OF MATERIALS

Nikon Metrology's configurable CT systems are optimized for high accuracy CT inspection of different materials, such as metals, composites, plastics and rock. The ultra-robust structure, microfocus sources and high resolution detectors are perfectly matched to deliver high image fidelity with micron accuracy.

## SMALL TO LARGE SAMPLES

True versatility allows the users to inspect a wide range of sample sizes: from a small high pressure blade to a large dinosaur bone. The adjustable panel allows you to focus on details by detecting more X-rays when positioning closer to the source. Or when moving from side to side it allows for scanning samples that don't fit in one detector view.



## STUNNING IMAGE CLARITY

To reduce undesired scatter and noise when scanning dense samples, Nikon Metrology's Curved Linear Diode Array (CLDA) technology optimizes the collection of X-rays traveling through objects and cuts down on scattered X-rays. Each CLDA crystal is positioned parallel to the X-ray beam for optimum efficiency, unbelievable image contrast and reduced scan time. Like a carefully selected camera filter, the CLDA eliminates scatter pollution and results in an image worth framing.

## REVITALIZE EXISTING FACILITIES

Nikon Metrology's modular microfocus CT systems can be built into existing cabinets or walk-in rooms to upgrade older film-based facilities or mini-focus systems. When upgrading to the latest X-ray CT technology, users can obtain the highest possible detail and better insights into product conformity.

## NON-STOP NIKON QUALITY

Investing in Nikon Metrology means investing in unparalleled longevity and minimal maintenance. With a legacy of superior machinery and innovative design since 1987, Nikon Metrology's X-ray machinery runs smoothly and continuously 24 hours a day, 7 days a week.





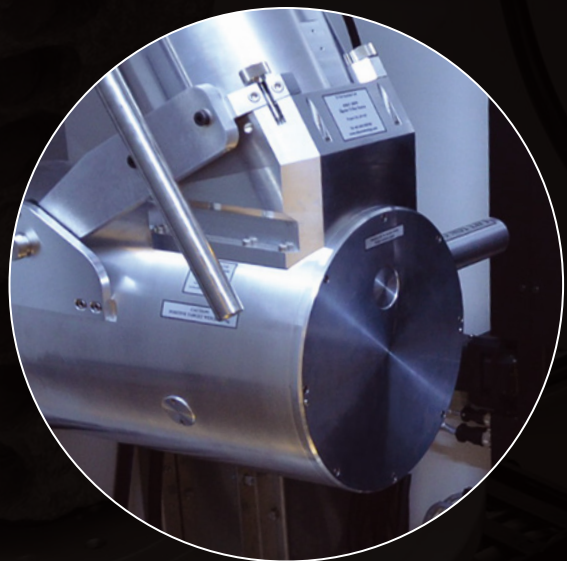
# EVERYTHING STARTS AT THE SOURCE

## MULTIPLE SOURCES, INFINITE POSSIBILITIES

Nikon Metrology microfocus sources offer unmatched versatility for objects big and small. Featuring a wide range of spot sizes and power ratings, these open-tube sources are fully configurable and interchangeable to accommodate a wide range of density and material requirements. Expect precise measurements and stunning spatial resolution with every scan.

## THE WORLD'S ONLY 450 kV HIGH BRILLIANCE MICROFOCUS SOURCE

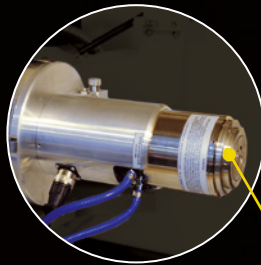
The 450 kV microfocus source combines continuous power with stunning resolution. This source features an 80  $\mu\text{m}$  spot size and incredible spatial resolution for faster CT scanning, faster data collection and the highest accuracy and precision available. Perfect for high-density objects – never miss a detail with the 450 kV microfocus source.



# ONE X-RAY SOURCE, FIVE TARGETS

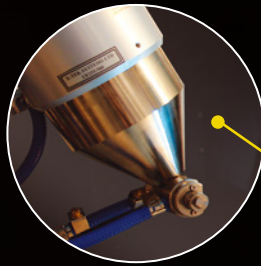
## 180 kV TRANSMISSION TARGET

The 180 kV transmission target features a minimum spot size of 1  $\mu\text{m}$  for precise results and incredible geometric magnification, ideal for miniscule rock cores and bone samples.



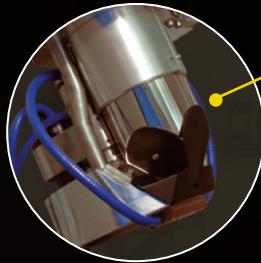
## 225 kV ULTRAFOCUS REFLECTION TARGET

The 225 kV UltraFocus reflection target has a 3  $\mu\text{m}$  spot size that offers seamless adjustments for sharp and highly-focused images. The most versatile X-ray source on the market can be perfectly primed for each inspection.



## 225 kV ROTATING TARGET

Featuring a microfocus spot size at high powers and geometric magnification of 150x and above for highly effective defect monitoring, the rotating target offers continual operation without overheating.



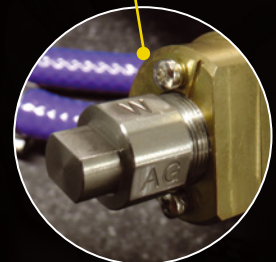
## 320 kV REFLECTION TARGET

The 320 kV reflection target features a 30  $\mu\text{m}$  spot size and geometric magnification of 150x and above, providing precise measurements and exceptional resolution for large rocks, small castings, and other larger-sized or high-density objects.



## MULTI-METAL TARGET

Often, using a lower energy X-ray emission is beneficial in material analysis and that can be achieved with the multi-metal target. Beside the standard tungsten (W) target, the operator can easily select from three other target materials: silver (Ag), molybdenum (Mo) and copper (Cu).



# C2

## LARGE-ENVELOPE PRECISION LIMITLESS CONFIGURATIONS. FLAWLESS SCANS

Dense and unwieldy objects are no problem for the Nikon Metrology C2 scanning system. Configurable with dual sources, dual detectors and multi-position panel shifting, this system can accurately scan objects up to 150 kg in weight. The C2 delivers an unrivaled inspection envelope via synchronized vertical X-ray source and detector motion.

### Technical specs

Weight capacity: 150 kg

X-axis travel: up to 1300 mm

Y-axis source travel: 1400 mm

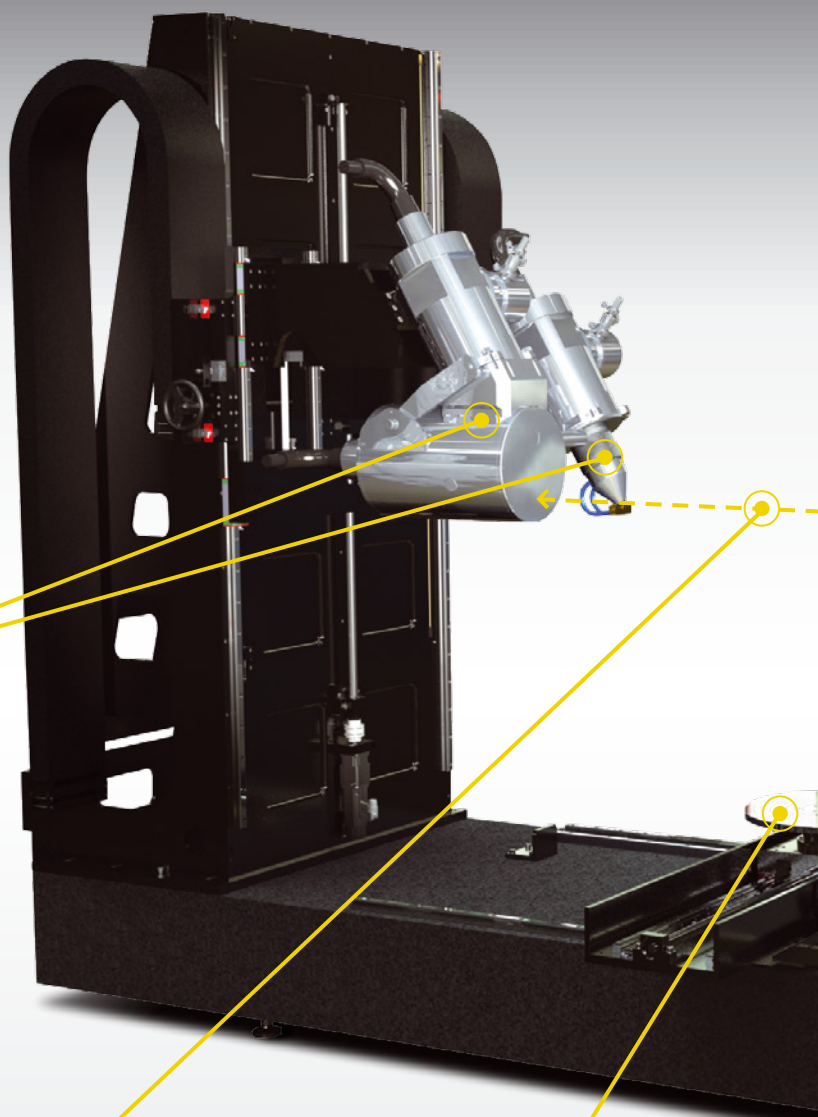
Y-axis detector travel: 1300 mm

Z-axis travel: up to 1700 mm

DUAL-SOURCE OPTION FOR INTERCHANGEABLE  
MICROFOCUS 225 AND 450 KV SOURCES

350 MM TO 2000 MM VARIABLE  
SOURCE-TO-DETECTOR DISTANCE

360° CONTINUOUS ROTATION

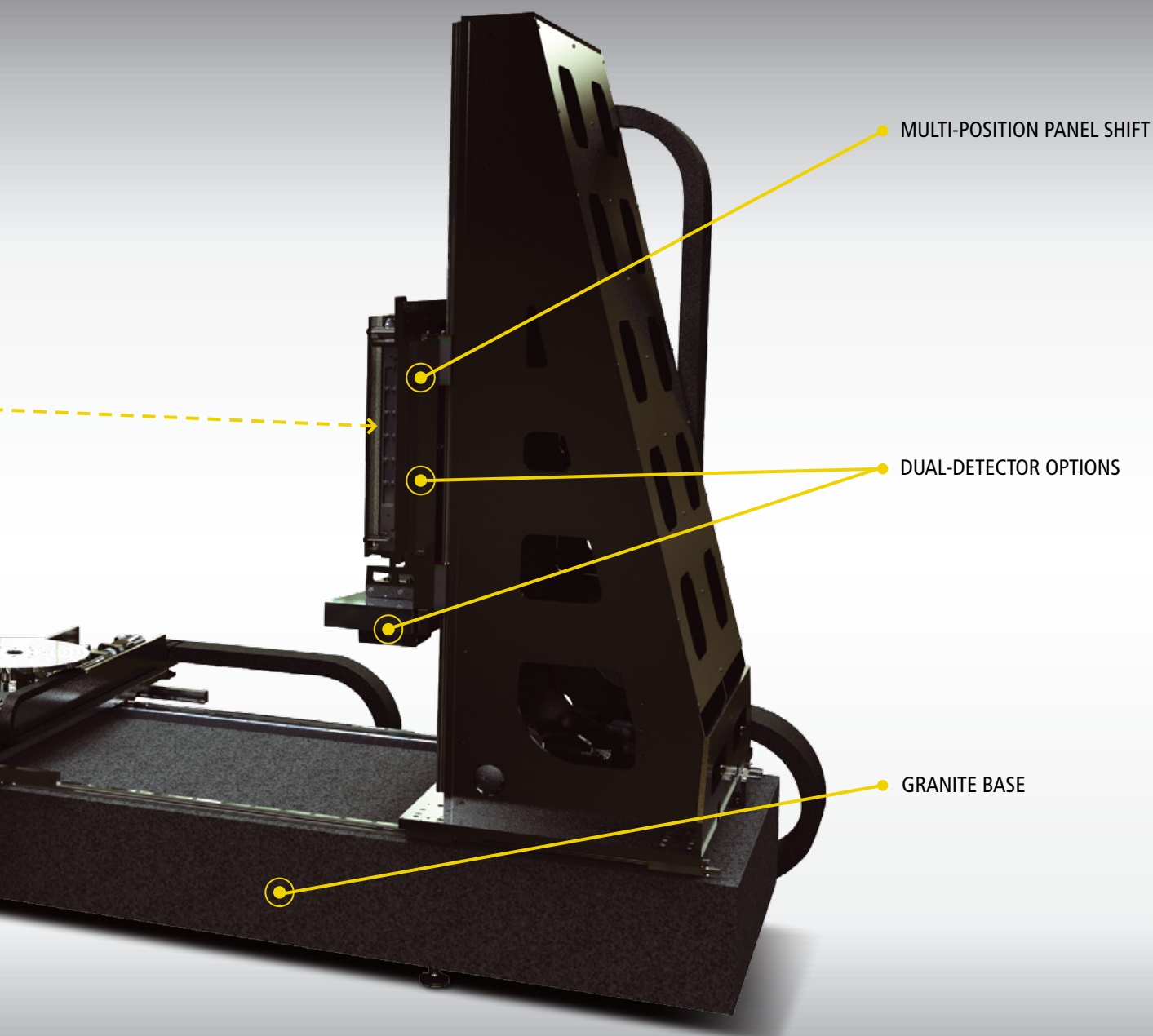




# ION CT SCANNING SYSTEM

ANS.

Everything about the C2 is versatile and robust. The system offers perfect precision thanks to its 4.3-meter long granite foundation and is configurable with an area detector and Nikon Metrology's Curved Linear Diode Array (CLDA) to reduce scatter and dramatically improve image definition. With quick assembly and incredible longevity, the C2 will exponentially increase the quality and productivity of CT scans.



# M2

# COMPACT PRECISION CT

## EXCEPTIONAL CONFIGURABILITY FOR ALL

The M2 completely redefines industrial CT scanning. Configurable for dual sources, dual detectors and multi-position panel shifting, this system can accurately scan objects of all shapes and sizes. The M2 is equipped with a vertical manipulator as well as a tilting turntable, with a sample bridge supported on both ends for ideal positioning and accuracy.

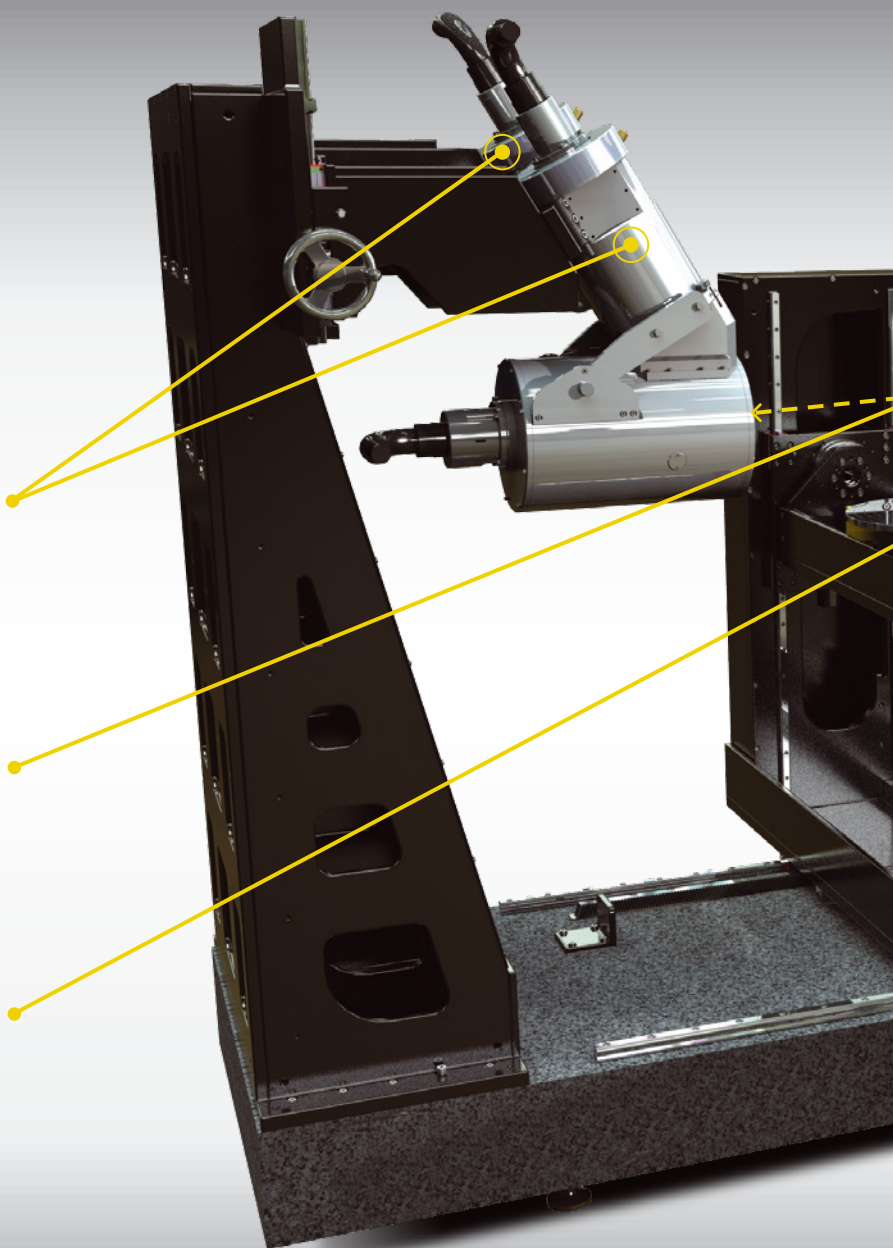
### Technical specs

Weight capacity: 100 kg  
X-axis travel: 500 mm  
Y-axis travel: 740 mm  
Z-axis travel: up to 1700 mm

DUAL-SOURCE OPTION FOR INTERCHANGEABLE  
MICROFOCUS 225 AND 450 KV SOURCES

400 MM TO 2200 MM VARIABLE  
SOURCE-TO-DETECTOR DISTANCE

+/- 30° TILT  
360° CONTINUOUS ROTATION

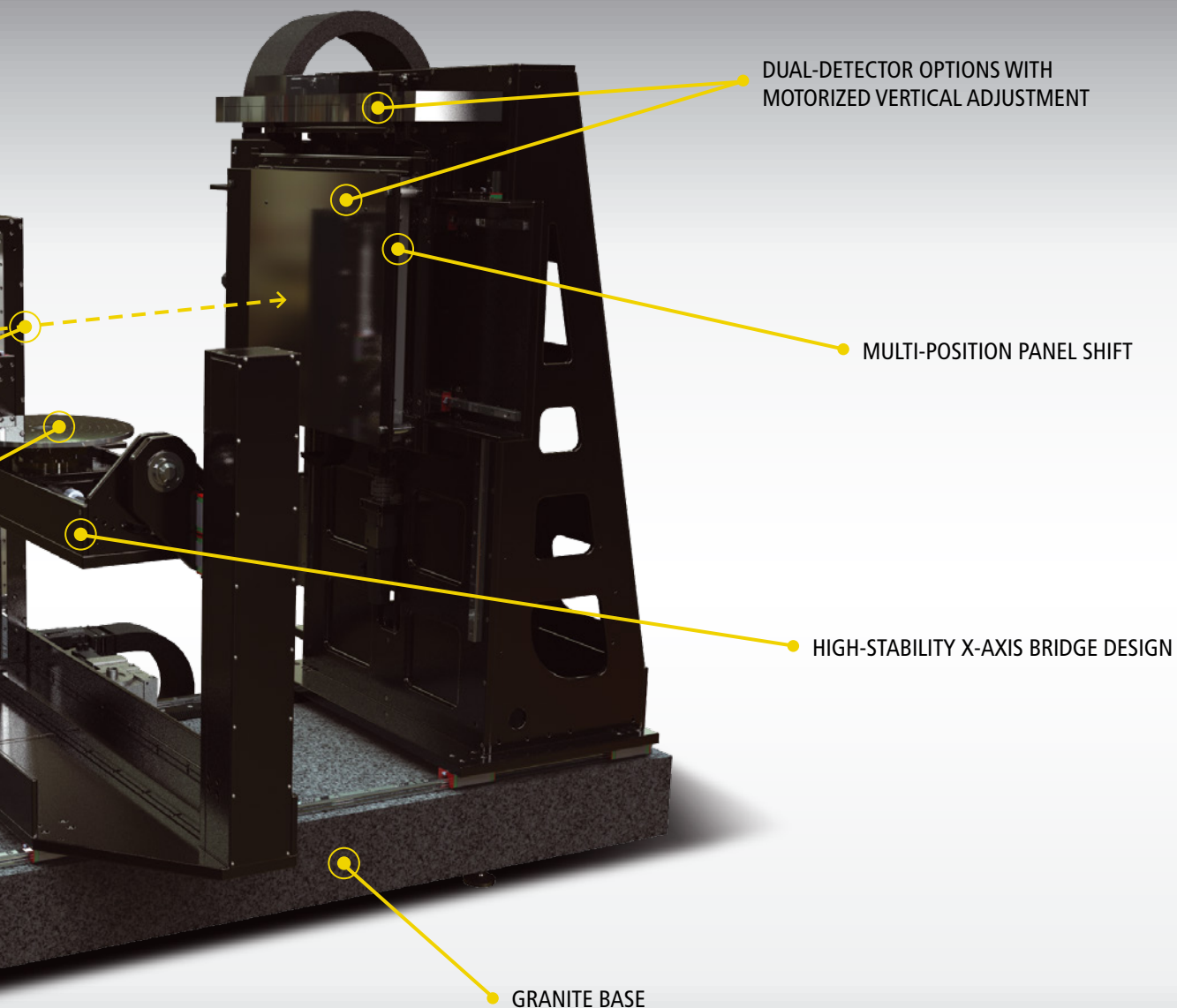




# SCANNING SYSTEM

## OF YOUR SCANNING NEEDS.

The M2's perfect precision stems from its 3-meter long granite base, with exceptional flatness across its entire surface. The machine utilizes a variety of detectors including Nikon Metrology's Curved Linear Diode Array (CLDA) to reduce scatter and dramatically improve image definition. Simply put, the M2 is the most versatile CT scanning system on the planet.



# M1

## SINGLE SOURCE 6-AXIS

Available to retrofit into an existing X-ray enclosure, new shielded enclosure, or a self-contained standalone cabinet, the M1 takes X-ray imaging to the next level. Equipped with a single-source and a single-detector, the M1 can provide invaluable measurements from a wide range of positions with X, Y and Z-axis travel and tilt capabilities.

### | Technical specs

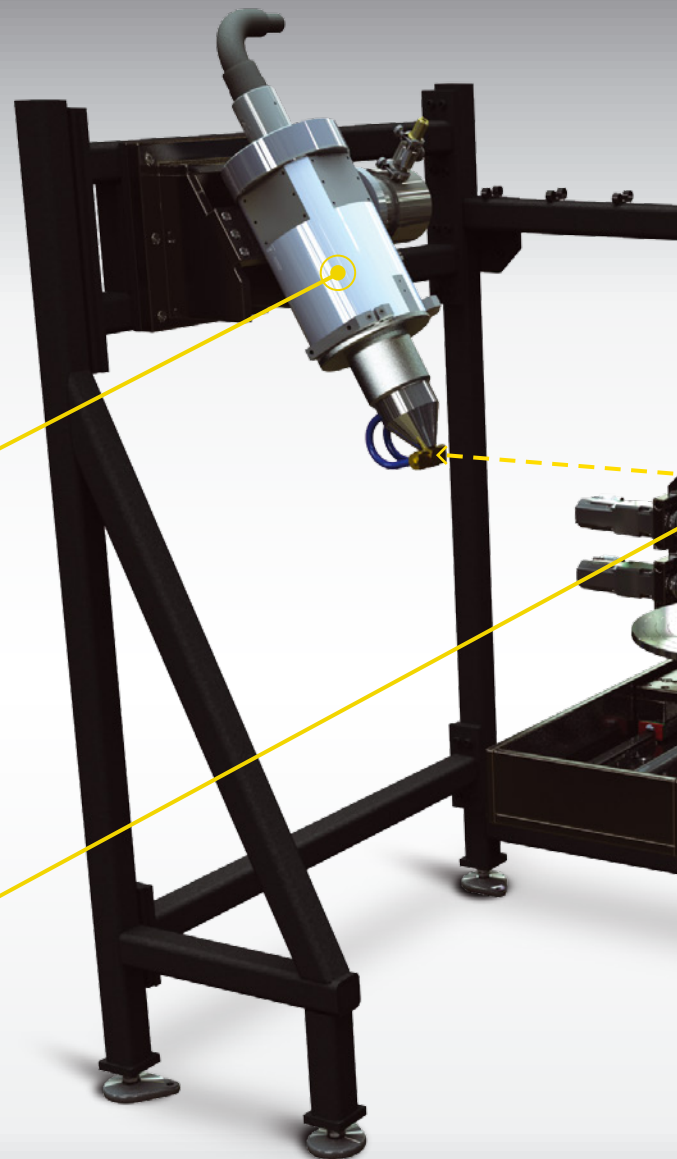
Weight capacity: 50 kg

X-axis travel: 500 mm

Y-axis travel: 740 mm

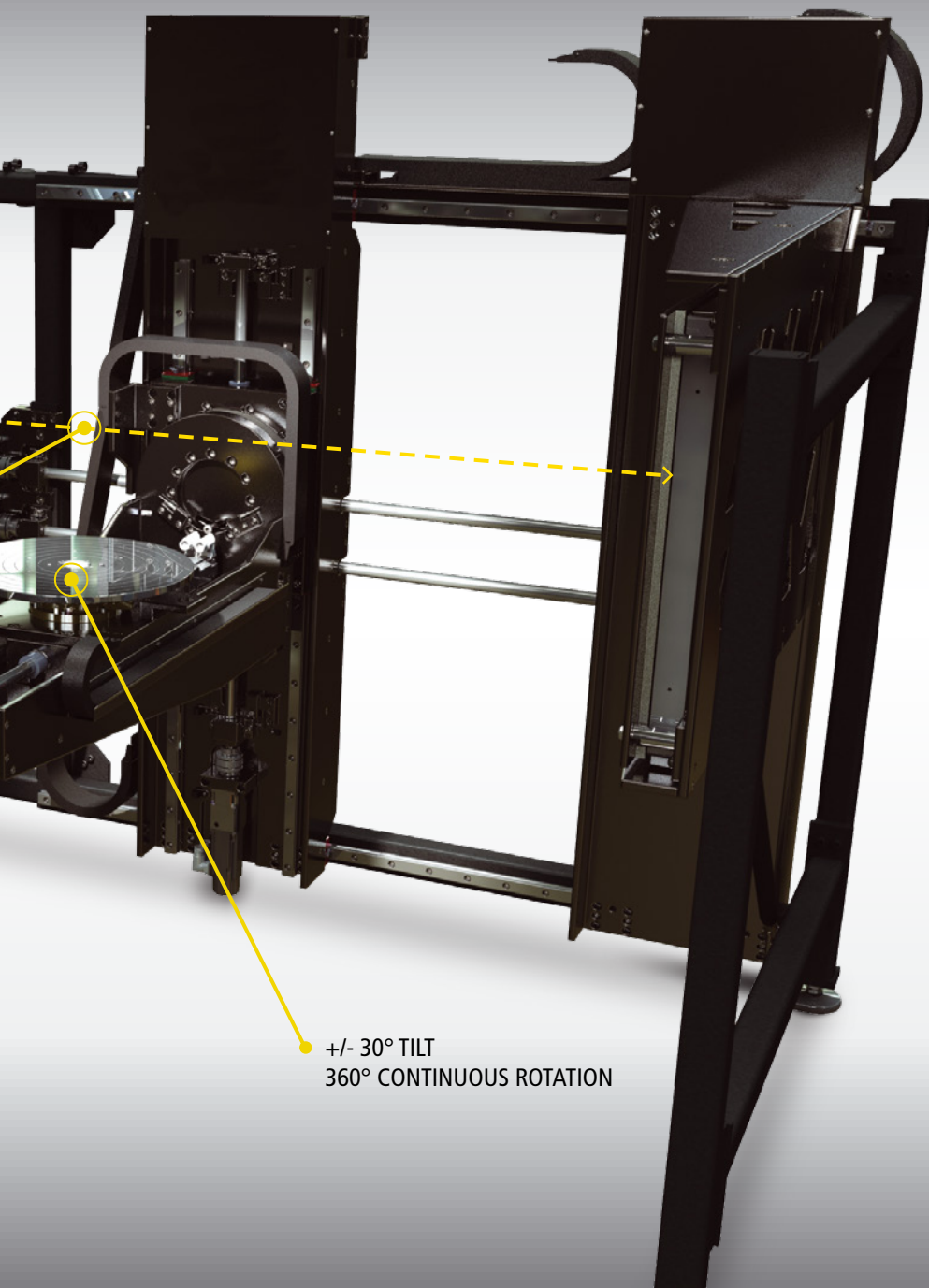
160 KV TO 450 KV  
MICROFOCUS SOURCES

550 MM TO 1625 MM  
MOTORIZED ADJUSTABLE  
SOURCE-TO-DETECTOR DISTANCE



# PRECISION CT SCANNING SYSTEM

This robust and economical system can fit into virtually any space and is configured for quick and convenient assembly. The M1's superior design allows for rapid install to scan capability.



+/- 30° TILT  
360° CONTINUOUS ROTATION



# SYSTEM CONFIGURATION

## Sources

Microfocus source	Max. kV	Max. power	Focal spot size	
160 kV Reflection target	160 kV	225 W	3 µm up to 7 W	225 µm at 225 W
180 kV Transmission target	180 kV	20 W	1 µm up to 3 W	10 µm at 10 W
225 kV Reflection target	225 kV	225 W	3 µm up to 7 W	225 µm at 225 W
225 kV Rotating target option	225 kV	450 W	10 µm up to 30 W	160 µm at 450 W
320 kV Reflection target	320 kV	320 W	30 µm up to 30 W	320 µm at 320 W
450 kV Reflection target	450 kV	450 W	80 µm up to 50 W	320 µm at 450 W
450 kV High brilliance source	450 kV	450 W	80 µm up to 100 W	113 µm at 450 W

## Detectors

Detectors	# Bits	Active pixels	Pixel size	Max. frame rate at 1x1 binning	Max. frame rate at 2x2 binning
Varian 1313Dx	16-bit	1000 x 1000	127 µm	30 fps	60 fps
Varian 2520Dx	16-bit	1900 x 1500	127 µm	12.5 fps	30 fps
Varian 4030	14-bit	2300 x 3200	127 µm	3 fps	7 fps
Perkin Elmer 0820	16-bit	1000 x 1000	200 µm	7.5 fps	15 fps
Perkin Elmer 1611	16-bit	4000 x 4000	100 µm	3.75 fps	7.5 fps
Perkin Elmer 1620	16-bit	2000 x 2000	200 µm	3.75 fps	7.5 fps
Perkin Elmer 1621 EHS	16-bit	2000 x 2000	200 µm	15 fps	30 fps
Nikon Metrology CLDA	16-bit	2000	415 µm	50 fps	

## Platforms

	M1	M2	M2 Stretch	C2
<b>Manipulator</b>				
# Axes	6	8	8	7
Axes travel	(X) 500 mm (Y) 740 mm (Z) 1100 mm (Tilt) +/- 30° (Rotate) n*360°	(X) 500 mm (Y) 740 mm (Z) 1100 mm (Tilt) +/- 30° (Rotate) n*360°	(X) 500 mm (Y) 740 mm (Z) 2100 mm (Tilt) +/- 30° (Rotate) n*360°	(X) 1300 mm (Y) 1400 mm (Z) 1700 mm (Rotate) n*360°
Max. sample weight	75 kg	100 kg	100 kg	150 kg
<b>General specifications</b>				
Minimum Enclosure Dimensions (LxWxH)	3.0 m x 2.5 m x 2.1 m	3.0 m x 2.5 m x 2.1 m	4.0 m x 2.5 m x 2.1 m	4.5 m x 2.7 m x 2.9 m
Control software	All systems are controlled by Nikon Metrology's in-house Inspect-X software			



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