



**ASTROPHYSICS™**

TOMORROW'S TECHNOLOGY FOR TODAY'S SECURITY

- TRANSPORTATION
- PORTS & BORDERS
- CRITICAL INFRASTRUCTURES

# HXC-320 VEHICLE SCANNER

## X-Ray Portal Series



GIVING YOU REAL VISIBILITY TO VULNERABILITIES AND THREATS



# HXC-320 Vehicle Scanner

In today's world, we cannot take our safety for granted – security matters more than ever before. The smuggling of illicit items such as weapons, explosives, prohibited goods, and other contraband continues to be a very real threat and these threats are not only found in obvious locations such as airports and government buildings, but they are now becoming more prevalent in vehicles. In addition to border control, locations such as shopping centers, museums, and large sporting events are adopting vehicle inspection systems to keep their patrons safe.

At Astrophysics, we identify security needs and dedicate ourselves to creating the most innovative X-ray imaging systems in the world. We customize each system to fit your exact requirements and to adapt to your specific environment – and we do so at a very competitive cost.

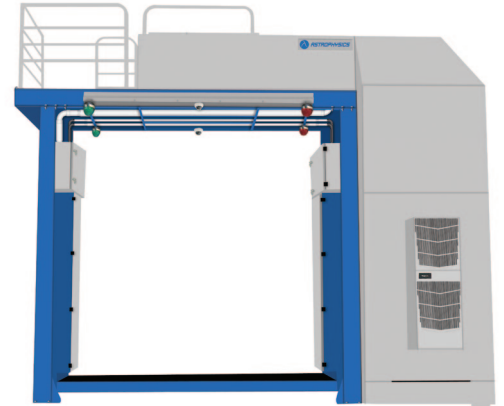
## FEATURES & BENEFITS

- Quick and efficient vehicle inspections
- Identify threats such as explosives, weapons, smuggled goods, and other contrabands
- Customizable for individual requirements
- Maximum image clarity using a 320kV generator
- Symmetrical downshooter beam direction provides excellent image quality without the distortion common to sideshooter systems
- Compact design and small footprint
- High throughput with up to 180 vehicles per hour, assuming there is a single operator and 20 second image analysis
- Steel penetration typically 60-65mm

## ABOUT THE HXC-320?

The Astrophysics HXC-320 Vehicle Scanner is specifically designed to scan cars and motor vehicles with a height of 2.7 meters and a width of 2.6 meters. The HXC-320 scans vehicles to identify hidden contraband, such as smuggled goods, explosives, narcotics and weapons. The HXC-320 has a 320kV X-ray generator that allows the car scanner to operate as a drive-through portal, without the need to unload drivers and passengers. Its' easy process, automated operation and high throughput, reduce the need for manual inspection and locations experiencing high volume traffic will experience lower backlog and delays.

The HXC-320 is an efficient and customizable solution for the protection and inspection of critical infrastructure locations such as government facilities, military checkpoints, sporting events, and land and sea borders. Several installation options are available: in-ground installation eliminating the need for a ramp, and a conveyor system for unmanned vehicles if a pull-through operation is preferred.



## OPTIONAL FEATURES

- Climate Operating Kit
- Inspection Office
- Under Vehicle Inspection Camera System
- License Plate Reader
- Radiation Meter
- Vehicle Transportation System
- Ramp (no in ground installation necessary)

# Advantages of a Downshooter Vehicle Scanner

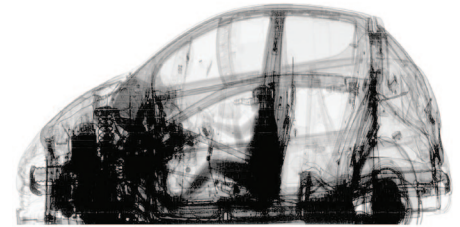
The Astrophysics HXC-320 shoots its X-ray beams from above, **symmetrically downward** towards the car. The downshooter beam direction allows for a **clear view** around the wheels, fuel tank, battery, seats, glove compartment, etc.

The HXC-320 will penetrate more than **60 mm of steel**. This is more than adequate for penetrating almost the entire vehicle. More importantly it allows for the better display of organic materials such as explosives, drugs, or agricultural products. An example of a scan from the HXC-320 is shown here, and gives a comprehensive look into a vehicle. You can clearly identify the different parts of the car, making it much easier for operators to spot threats and contraband.

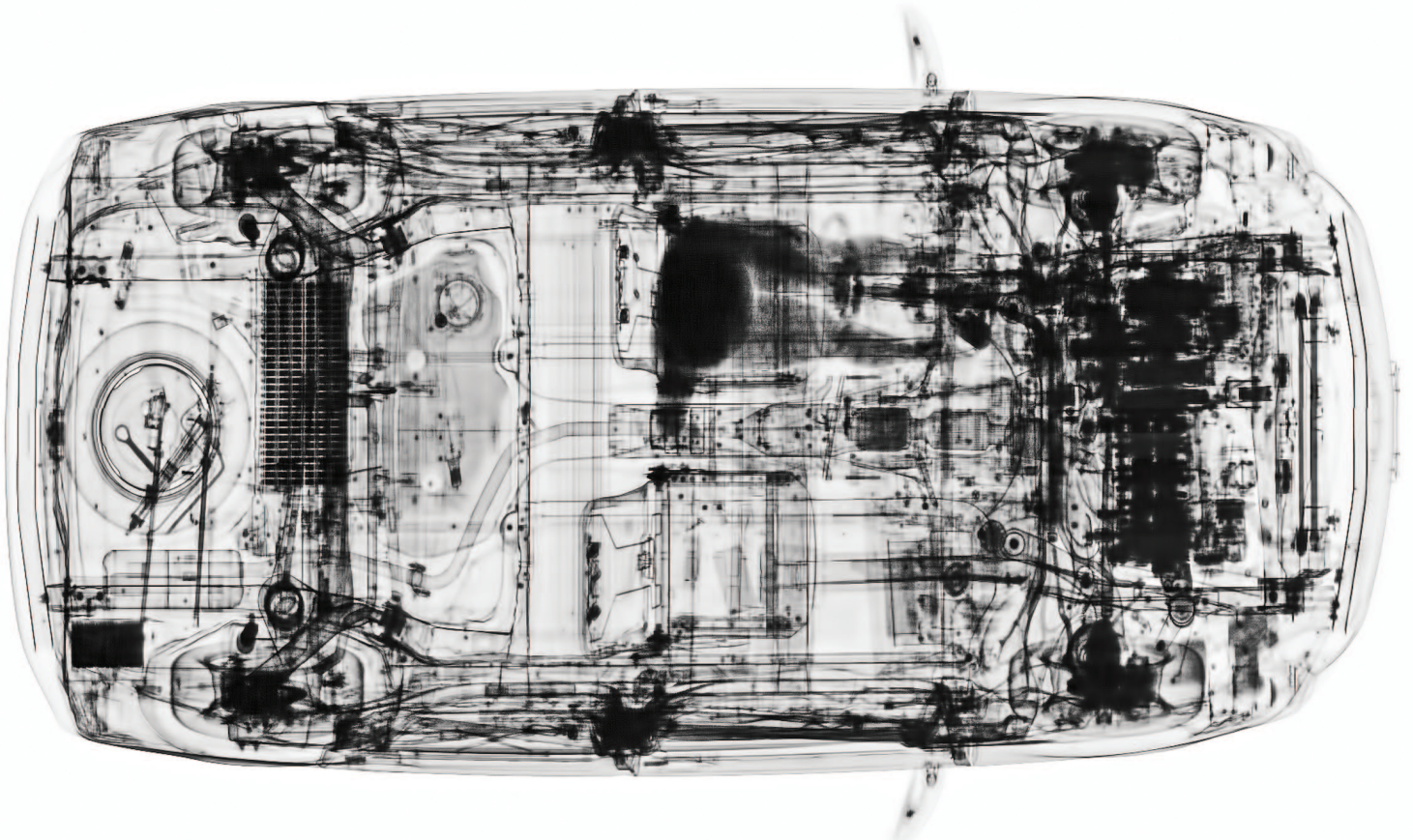
## ASTROPHYSICS DOWNSHOOTER X-RAY IMAGE OF A TOYOTA PRIUS HYBRID



### COMPARISON IMAGE



Above is a representative image of a car scanned with a vehicle scanner that has its X-ray beams shooting from the side.



# How It Works

The HXC-320 enables **rapid and effective** scanning of vehicles with the minimum impact on their movement. The structure itself has a robust design, able to withstand the rigors of operating in **harsh environments**.

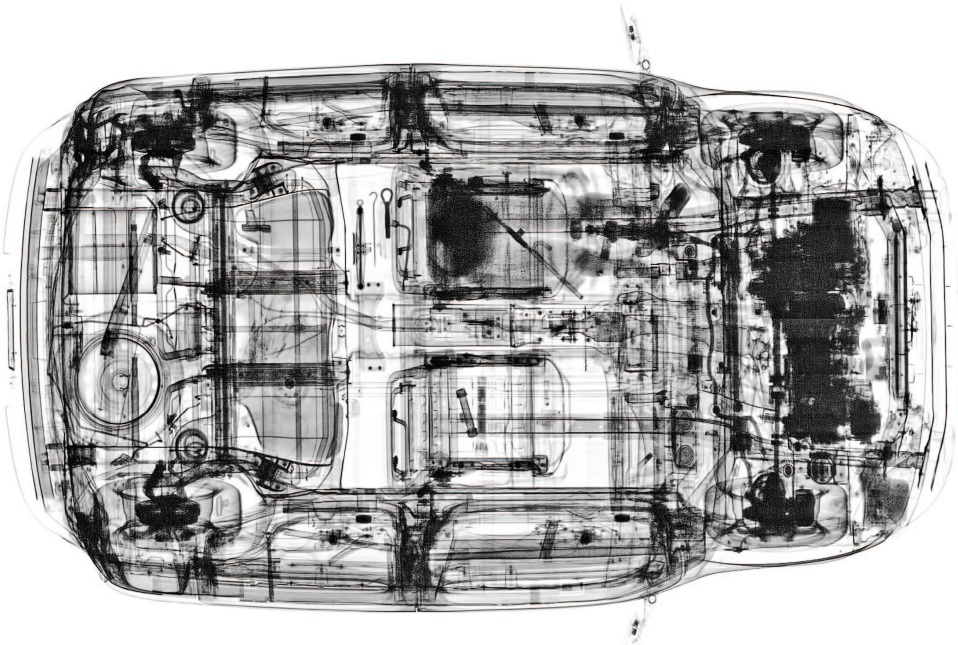
The HXC-320 is capable of an average throughput of over **180 cars per hour**, assuming each car is traveling at 8 km/hr and allocating 20 seconds for a single operator to review each image. Utilizing two operators can double the amount of cars scanned per hour. The actual throughput will depend on how the user wants to handle cars while awaiting the results of the image analysis. Some cars will clear quickly, but others, especially those with more items, will take longer. If image analysis takes place while the vehicle is still in the scanner, the next car will have to wait for a decision before being scanned.

## CAN YOU SPOT THE THREATS?

Even the untrained eye would easily be able to identify threats in this X-ray scan.

### ASTROPHYSICS HXC-320 X-RAY IMAGE OF A NISSAN CUBE

Compared to other vehicles, the Nissan Cube is considered a small car with simple mechanics.



## SAMPLE THREATS USED



### THREATS IDENTIFIED IN SCAN

- 12-gauge shotgun in the trunk
- Pipe bomb under the passenger seat
- 9mm handgun under the rear passenger seat

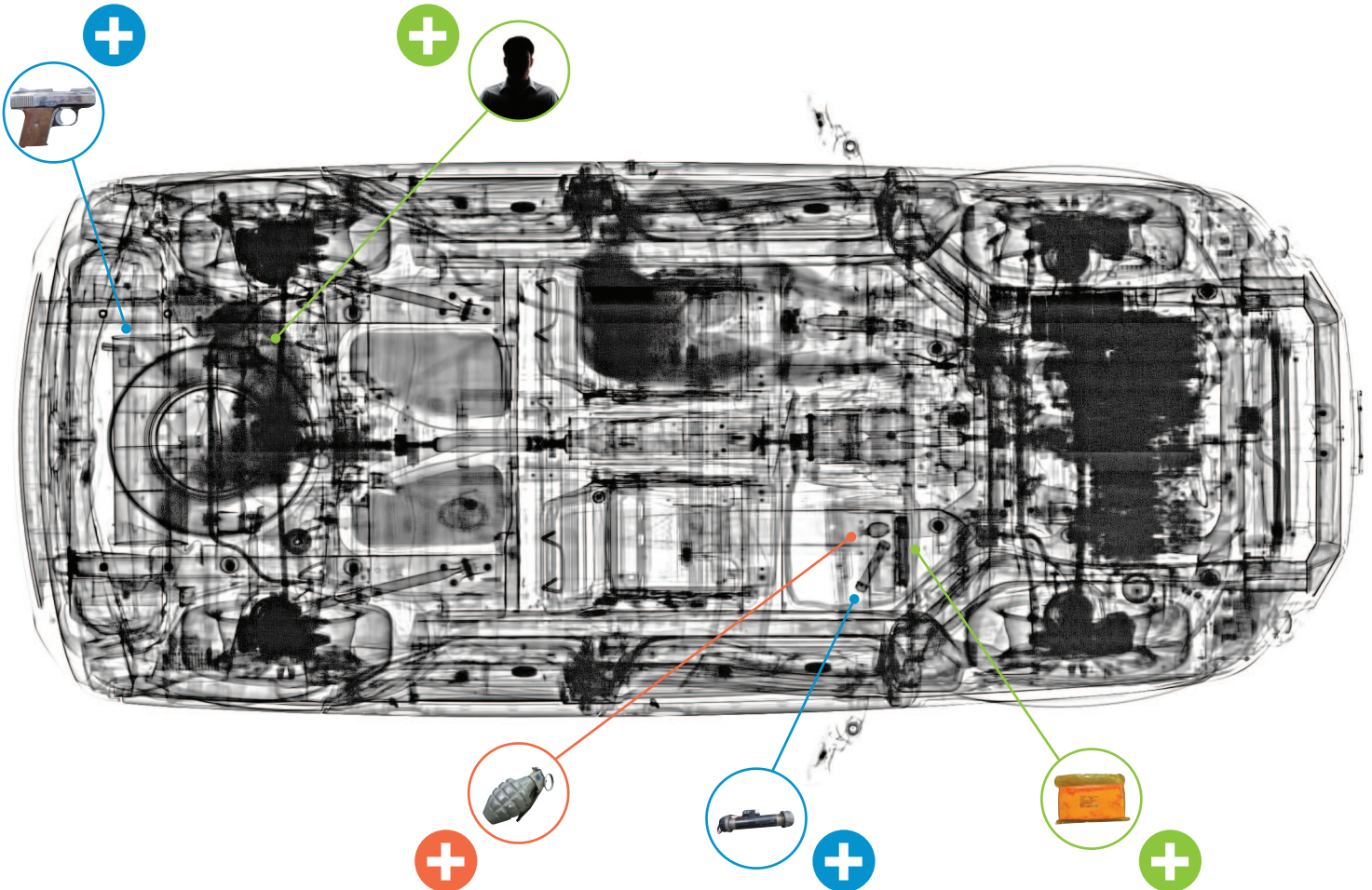
# Security Threats

Below is a sample X-ray scan of a Land Rover LR2. Unlike the Nissan Cube, this SUV is considered a **large vehicle** and has a much more complex mechanical system. This makes it **harder to identify** contrabands.

Even with a vehicle as complicated as a Land Rover, a trained operator would quickly be able to find a man hiding in the trunk holding a handgun and see a hand grenade, pipe bomb, and C4 simulant in the glove compartment. The clear image that the HXC-320 provides, along with the operator's understanding that **there is symmetry** to the parts on the right and left sides of a car, greatly assist operators in quickly identifying abnormalities.



## EASILY IDENTIFY SECURITY THREATS



# Smuggled Goods

Every country's point of entry must be protected from various threats, even those that are seemingly harmless. Each authority may define restricted items differently. Items often prohibited at ports and borders are **cigarettes, alcohol, drugs, ancient artifacts, animals and agricultural products**.

The U.S. Customs and Border Protection (CBP) examines agricultural products or packaging materials that may contain **invasive species** that could harm our own agriculture and environment. They also ensure fruits, vegetables, and wood items are pest free.

**Agro-terrorism** is also a new type of threat targeting components of agriculture or the food supply. Agricultural inspections have traditionally focused on unintentional introduction of pests or diseases - those unnoticed in containers or somebody's luggage. Agro-terrorism is focused on the **deliberate introduction** of plant or animal pests, disease, or the contamination of food materials with a toxic substance. (taken from [www.cbp.gov](http://www.cbp.gov))



## IDENTIFY PROHIBITED PRODUCTS



# Radiation Safety

## WHAT IS BACKGROUND RADIATION?

**Background radiation** is the natural radiation that is always present in the environment. There are three types of background radiation: cosmic radiation from the sun and stars, terrestrial radiation which comes from the Earth, and internal (inhalation and ingestion) radiation which exists in all living things.

Background radiation can be found in **everyday items** such as granite counters and can be ingested when eating high potassium foods such as a banana.

The radiation exposure from driving a car through an HXC-320 is equivalent to approximately **twenty minutes** of the normal background radiation we are exposed to every day, at least in Los Angeles. Elevation plays a factor because more radiation is present the closer you are to outer space. A roundtrip flight from Los Angeles to New York for example, would be approximately **400 car scans** in our HXC-320.




## Natural Radiation is Everywhere.



## HOW DOES ONE HXC-320 VEHICLE SCAN COMPARE TO OTHER X-RAYS?

- Medical X-ray of an Arm = 10 HXC-320 Vehicle Scans
- Dental X-ray = 50 HXC-320 Vehicle Scans

## THESE EVERYDAY ACTIVITIES ARE EQUIVALENT TO APPROXIMATELY HOW MANY HXC-320 VEHICLE SCANS?

	ACTIVITY	EXPOSURE
	Eating One Banana	1 Scan
	1 Day in Denver, CO	144 Scans
	Roundtrip Flight from Rome to Dubai	400 Scans



### GENERAL SPECIFICATIONS

- Tunnel Size: 305 cm x 320 cm  
(W x H) 120" x 126"
- Max. Vehicle Size: 264.2 cm x 271.8 cm  
(W x H) 104" x 107"
- Dimensions (excludes ramp): 561.3 cm x 284.5 cm x 490.9 cm  
(L x W x H) 221.0" x 112.0" x 193.3"
- Scanning Speed (drive through): Approx. 8 km/hour (5 mph)
- Inspection Throughput: Up to 225 vehicles / hour
- Steel Penetration<sup>1</sup>: 60mm Typical

### X-RAY GENERATOR

- Voltage: 320kV
- Beam Direction: Symmetrically Downward
- Detector: 4096 Channels in a Symmetrical U-Shaped Array
- X-ray Dose (drive through): 0.13  $\mu$ Sv / inspection

### COMPUTER & VIDEO

- Processor: Intel® Core i7, 2.93 GHz, 8MB cache
- Memory: 4 GB RAM at 1333 MHz
- Storage: 500 GB HDD
- Video Card: 1 GB, Dual Digital Display
- Platform: Windows® OS
- Backup Backup: Uninterrupted Power Supply (Computer Operation - 20 Minute)
- Display Type: Dual 27" LCD Color Monitors
- Display Resolution: Ultra HD3840 x 2160; 24 Bit/Pixel Color

### HEALTH AND SAFETY

- In compliance with ANSI 43.17 (Radiation Safety for Personnel Security Screening Systems using X-ray or Gamma Radiation), ICRP - 60 13-17 (International Commission on Radiological Protection), EU and US Guidelines

### INSTALLATION DATA

- Operating Temperature: -20°C to 40°C / -4°F to 104°F
- Storage Temperature: -20°C to 60°C / -4°F to 140°F
- Humidity: Up To 95% Non-Condensing
- Power Requirements: 200-230VAC, Single Phase, 50/60Hz, 30 Amp Max
- Power Consumption: Approx. 6.9 kVA
- Exclusion Zone: 1000 cm x 1000 cm (33 ft x 33 ft)

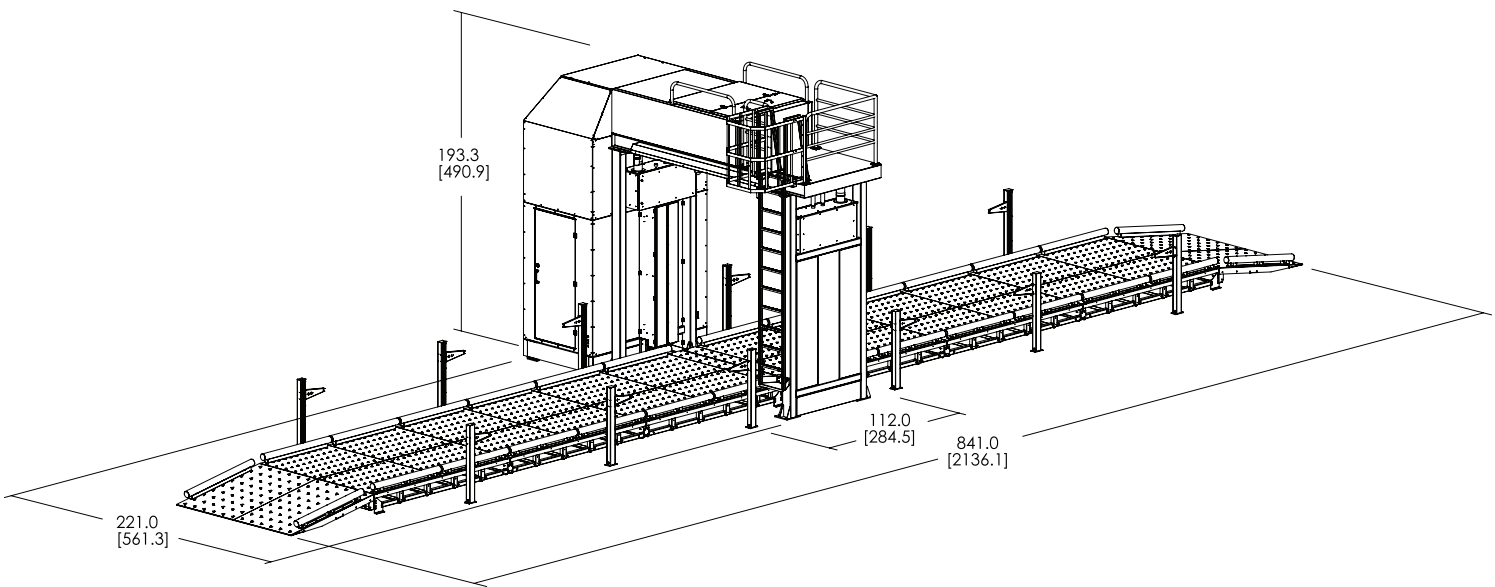
### STANDARD FEATURES

- Auto Image Archiving
- 9 Quadrant Zoom
- Color and Black / White Imaging
- Continuous Zoom
- High Penetration Function
- Image Annotation
- Image Review
- Inspection Workstation (up to 100m away from scan inspection area)
- Manual Bitmap Archive
- Material Discrimination
- Multi-Tier Accessibility
- Network Ready
- Organic/Inorganic Imaging
- Operator Training
- Picture Perfect
- Print Image Capable
- Pseudo Color
- Real-Time Image Manipulation
- Real-Time Self Diagnostics
- Reverse Monochrome
- Speedometer
- Vehicle Counter
- Vertical Zoom Panning

### OPTIONAL FEATURES<sup>2</sup>

- CCTV Camera System
- Climate Operating Kit\* (extend operating temperature range)
- Computer Based Training (CBT)
- Custom Paint
- Gate Inspection
- Inspection Office
- License Plate Reader
- Local Language Support
- Radiation Detection System
- Radiation Meter
- Ramp (no in ground installation necessary - capacity 3500 kg/7716 kbs)
- Remote Inspection Workstation
- Traffic Signals
- Under Vehicle Inspection Camera System

\* For regions with warm temperatures, additional insulation is added to the cabinet in order to extend the operating temperature to 50°C. For regions with cold temperatures, a heater option is included with the air conditioning unit.



<sup>1</sup> As tested on Astrophysics Inc. Test Piece.

<sup>2</sup> Optional Accessories may affect lead time, price, and weight of HXC-320. Please contact your Astrophysics Sales Representative for more information. Due to continued product research and development, Astrophysics Inc. reserves the right to amend all technical specifications without prior notice.