

Advancing Aviation and Homeland Security



T3-03

Explosive Detection System

→ www.qrsciences.com

For accurate
and effective
detection of
explosives,
QRSciences'
T3-03 delivers.

Here's Why...

Accurate

Unlike other explosive detection technologies, QRSciences' T3-03 directly detects the unique chemical signature of explosives. It does not use atomic number, mass, density or other indirect measurements to identify explosives.

As a result, when used in conjunction with x-ray security screening systems, the T3-03 gives the best detection and false positive performance of any primary baggage screening technique. If the ultimate in detection performance and low operational costs are important, the T3-03 delivers.

Easy-to-Use

QRSciences' T3-03 explosives detection system is simple to use. The unit operates from a stand-alone controller. An operator simply selects AUTO to load a bag, the analysis automatically executes and the result is reported to the operator via a red, green or amber light.

Fast

It takes a matter of seconds to scan a bag or package. The system throughput is up to 400 bags per hour. When the highest level of security is required, for example in aviation security applications, a throughput of 200 bags per hour is typical. Detection sensitivity is easily adjusted to meet the specific threat level required.

Low False Alarms

The T3-03 provides industry leading detection rates along with the lowest false call rate of any primary checkpoint explosive detection system available in the market today.

This is a direct result of the system's ability to chemically fingerprint

specific explosives. Other technologies imply the presence of explosives using indirect characterization methods such as density or elemental composition, which leads to frequent false positives from benign materials such as foodstuffs and paper products. Only the T3-03's quadrupole resonance (QR) technology directly detects high explosives.

Low Cost

The T3-03 is a fraction of the cost of CT systems and the unit cost is comparable to multi-view line scan x-ray systems. The low false positive rate means minimal secondary screening of bags is required with important savings in screening labor. Using mainly solid state radio frequency electronics and very few moving parts the T3-03 is also highly reliable and has inherently low maintenance requirements.

Film Safe

The QRSciences' T3-03 system uses low frequency radio waves at frequencies similar to those used by AM band radio stations. It does not use high energy ionizing x-rays and is entirely film safe.

Easy to Maintain

The T3-03 is a third generation system and has been designed with maintenance in mind. Every major hardware module on the system is easily accessible for maintenance or repair and the system includes diagnostic tools for use by factory trained technicians along with approved system validation procedures to ensure years of high operational availability.

How It Works

Theory of Operation

Atoms consist of an atomic nucleus composed of neutrons and protons, surrounded by electrons.

Atomic nuclei are not always spherically symmetric. When this is the case an atom has a nuclear quadrupole moment which can be pictured as similar to the "north" and "south" poles of a bar magnet.

The nuclear quadrupole moment of a nucleus orientates the nucleus with respect to the electric field created by the electron cloud surrounding the nucleus. In doing so the nucleus can only align itself in a limited number of orientations and tends to find the lowest energy state.

It is the transitions between these energy states, or alignments, that quadrupole resonance technology exploits to detect the presence of specific atoms found in explosives. Each transition occurs at a very specific resonant frequency giving quadrupole resonance the ability to unambiguously detect and identify specific explosives.

Industry standard
60 x 40cm
aperture

Access panels are located throughout
the system to ensure quick and easy
system access



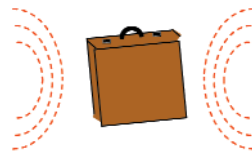
Conveyor mates to standard
powered and unpowered roller
tables for easy baggage flow

Electronics are located in
the base to minimize the
system footprint

Unit can be readily rolled
from location to location
and locked in place

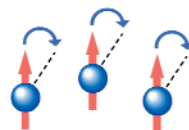
Step 1

When a bag is loaded into the T3-03 the bag is stopped, and "bathed" in radio waves at a specific target frequency.



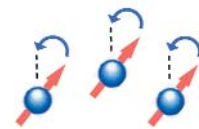
Step 2

If present within the bag, the nuclei of the target compound are disturbed or tipped out of alignment by the radio waves.



Step 3

After the radio wave pulse ends the nuclei return to their original state, and a characteristic radio signal is emitted.



Step 4

This signal is picked up by a sensitive receiver, digitized and sent to a computer for rapid analysis.



Step 5

The results are presented in seconds as either a "pass" or "fail" response.

Our focus is on
 Quadrupole
 Resonance.

Our business con-
 tinues to grow
 rapidly because of
 our technical
 capability, our
 reputation, and
 our commitment to
 excellence.

Product Specifications

Item	Specification
Meets TSA Advanced Technology requirements	Yes
Scanning Technology	Quadrupole Resonance
Detection	Sheet, bulk, and dispersed explosives
Countermeasure Detection	Yes
Dynamic Scan Frequency	Yes
Operating System	Windows
System Dimensions	
Length	3275 mm
Width	1180 mm
Height	1485 mm
Throughput	Up to 400 bags per hour
System Weight	850 Kg
Belt Height	710 mm - 800 mm
Belt Speed	0.5 m/sec
Maximum Bag Size	595 W x 380 H x 650 L mm
Maximum Bag Weight	40 kg
Computer Architecture	Pentium based computer
Alarm Indication	Red/Green/Amber
User Interface	Stand-alone Remote Control Unit with Cable
Display of Results	Stand-alone Remote Control Unit
Electrical Requirements	110-240 VAC; Single Phase 15 A max
Safety Compliance	Meets US FCC Part 18. Emits no ionizing radiation
Networking	PC based
UPS	Yes

About QRSciences

Background:

QRSciences designs and develops systems, sub-systems, components and software for security related applications. The Company is a leader in quadrupole resonance, magnetic sensing and advanced metal detection technologies. Applications for these technologies include explosive and narcotic detection, chemical manufacturing quality control and assurance, mineral and material assay, lab instrumentation and environmental science.

The Company's competitive advantage is proprietary patents and software and a highly acclaimed technical team including researchers, engineers and management from around the world.

Products and services offered by QRSciences include:

Products:

- T3-03 System
- T3-02 System
- X-ray Systems

Services:

Maintenance and extended warranty contracts available for all products.

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