Door Frame Metal Detectors

A **metal detector** is an electronic instrument which detects the presence of metal. Metal detectors are useful for finding metal hidden within objects, or metal objects buried underground. **A Door Frame Metal Detector (DFMD) as the name suggests is a metal detector fitted in a door to detect metal that may be hidden on the body of the person passing through this door.** This is also known as a "walk through" metal detector. These are used for security screening at access points in prisons, courthouses, and at airports to detect concealed metal weapons on a person's body.

The simplest form of a metal detector consists of an oscillator producing an alternating current that passes through a coil producing an alternating magnetic field. If a piece of electrically conductive metal is close to the coil, eddy currents will be induced in the metal, and this produces a magnetic field of its own.

The biggest technical change in detectors was the development of the induction-balance system. This system involves two coils that are electrically balanced. When metal is introduced to their vicinity, they would become unbalanced. What allowed detectors to discriminate between metals was the fact that every metal has a different phase response when exposed to alternating current.

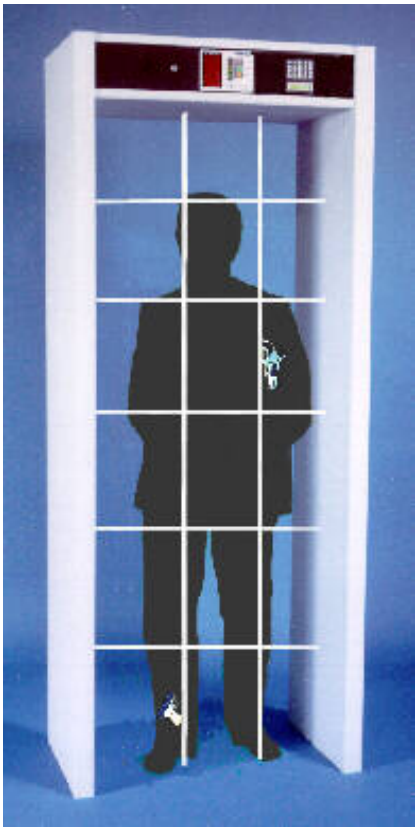
Security screening

Metal detector technology was adapted to screen airline passengers. Mining metal detectors housed in a large cylindrical pipe were used to make a commercial walk-through security detector. This eventually led to the development of the rectangular gantry, now standard at airports. Both alternating current and pulse systems are used, and the design of the coils and the electronics has moved forward to improve the discrimination of these systems. It is possible to indicate the approximate height of the metal object above the ground, enabling security personnel to more rapidly locate the source of the signal. Smaller hand held metal detectors are then used to locate a metal object on a person more precisely.
DFMD's are designed for high throughput with fewer unnecessary alarms. Targeted objects, such as guns and knives, are consistently and accurately detected, while personal items such as keys, coins, belt buckles and eyeglasses can pass through without causing an alarm.

DFMD TYPES

Door Frame metal detectors (DFMDs) are of two types:

- Single zone DFMD
- Multi-zone DFMD provide multi zone detection.



A **Multi zone DFMD** will identify whether the target is on the left side or right side of the person. If an individual walks through the DFMD with a concealed weapon located at their ankles, both the single and multi zone DFMD will locate the target. **The difference between the Single zone DFMD and Multi-zone DFMD is that the multi zone detector will be able to identify the location of the target, on either the left or right side of the individual.**

Multi-zone DFMD's deploy 'Continuous Wave Multiple Sensor Measurement Technique' over the commonly used 'Pulse Induction method'. This increases screening efficiency and cuts operating costs.

Multiple zones of detection allow the exact location of concealed weapons to be pinpointed. A display shows if a weapon is located on the left, right or centre of the person being screened and if it is at ankle, knee, waist, chest or head height. If more than one weapon is being carried each is detected and its location shown. During an ensuing manual search, security personnel can immediately target the object, or objects, that created the alarm(s.).

An important feature of horizontal multiple zone technology is its ability to efficiently discriminate between miniature handguns and harmless objects.

Multi-zone technology discriminates between miniature handguns and harmless objects like keys and coins

People being screened can pass through the detector without the inconvenience of having to empty their pockets of normal amounts of keys and coins. Weapons manufactured from steel, various grades of stainless steel, aluminium, zinc alloys and mixed alloys are detected using a single operating mode.
The technology offers excellent electrical interference rejection, thus eradicating false alarms that halt traffic flows. **The equipment is also continuously active, which means that weapons or contraband cannot be passed, slid or tossed through the detector undetected.**

Enhanced Features.

Traffic Counters: DFMD's are now built with intelligent and virtually invisible traffic counters which are integrated inside the coil panels. Counters are bi-directional with a decrease mode. Alarms, people and alarm rates can all be counted.

Remote security management: DFMD data can now be viewed at the desktop. It enables monitoring of passenger information, passenger data collection and processing with versatile reporting tools, as well as monitoring and management of all parameters of the DFMD.

Collect Statistics: Statistics can be summarized, shared by email and printed in easy-to-read reports.

Monitors Passenger Flow: Authorized personnel can view the traffic and alarm levels of the DFMD's that are connected to the network. The view gives you a quick overall look of lines with high traffic, helping one to better deploy resources.

Monitors Security: Whenr there is a deviation from the original settings stored in the PC, the operator receives an alert. This feature quickly indicates any misuse or malfunctions of the DFMD and increases the overall security level.

Other Applications.

Most DFMD's have phase sensitive detection circuits, that allow the user to enhance the sensitivity for certain group of metals and reduce it for others. DFMD's are designed to detect both Ferrous and Non Ferrous Metals. With higher sensitivity they can be used in the **Jewellery manufacturing units** to protect against pilferage.
High Sensitivity DFMD's are designed specifically for detecting small ferrous and non-ferrous items, such as disposable prison razors, a piece of razor blade, metal shanks, handcuff keys, detonator caps, jewellery, coins, microprocessor and memory chips. Use of such DFMD's increases safety in **prisons and jails** by efficiently detecting small metal objects that can be used as weapons, even when they

are hidden in body cavities. They are also deployed in **manufacturing and distribution facilities** to protect small, valuable assets.

Factors to consider when evaluating a DFMD.

Uniform Detection: It is important to select a detector that gives uniform detection throughout the entire interrogation region. The detection response from a poorly designed conventional detector will not be linear. High sensitivity hot spots and low sensitivity regions known as dead spots may be present within different regions of the detection field. The detection response from a particular metal object will vary as it is carried through different sectors of the gate.

Electrical and electromagnetic interference: They can play havoc with their performance and often render them unusable. Interference rejection is what separates quality detectors from others. Quality detectors utilize highly efficient noise inhibition software algorithms. Noise originates from a variety of sources; flickering fluorescent light tubes, computer monitors, photocopiers, two-way radios, etc. The level of ambient noise will vary from location to location. **It is advisable to test the DFMD in the location where it will eventually be installed.**

Continuously active detection: Always select a detector that is continuously active. At no time should the detection circuitry be deactivated. **Under no circumstances should a non-continuously active DFMD be installed in an unmanned automatic entry door system.**

Metal types: For both weapons screening and pilferage prevention the detector must be capable of efficiently detecting a variety of metals in a single operating program.

Object transit speed and Orientation: Irrespective of whether the target object is carried very slowly, quickly or tossed through the detector it should always be detected. It should also be possible to detect the target irrespective of its orientation.

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