DOWNLOAD PDF LOMA METAL DETECTOR MANUAL

Chapter 1 : Industrial Metal Detectors & Detection Equipment

User Manuals for Loma systems inspection equipment. Loma Systems provide x-ray inspection systems, checkweighers and award-winning metal detectors for the food, pharmaceutical and packaging industries.

This type of system was registered as a patent in the 19th century, but the first industrial metal detector was not produced until The progress of technology has taken metal detectors from valves to transistors, to integrated circuits and more recently, into microprocessors. Naturally, this has increased their performance providing greater sensitivity, stability and flexibility, as well as widening the range of output signals and information they are able to provide. All the same, modern metal detectors are still unable to detect every particle of metal passing through their aperture. The physical laws applied in the technology limit the absolute capability of the system. Consequently, as with any measuring system, metal detectors have restrictions on accuracy. These restrictions vary depending on the application, but the main criteria is the size of the detectable metal particle. However, despite this, metal detectors perform a valuable and essential role in process quality control. The first category consists of systems with a general purpose search head. These systems are capable of detecting ferrous and non-ferrous metals as well as stainless steels, in fresh and frozen products - either unwrapped or wrapped, even in metallized films. The second main category consists of systems which have a ferrous-in foil search head. These are capable of detecting ferrous metals within fresh or frozen products which are packed in foil wrapping. How it Works All general purpose metal detectors work essentially in the same way, although for optimum performance you should select a metal detector which has been designed specifically for your application. For optimum performance you should select a metal detector which has been designed specifically for your application. As you will see in diagram 1, the typical detector is encased in a metal box. This houses the coil components and provides a shield to protect them. The aperture, the tunnel through which the products pass, is lined with a non-metallic material usually plastic , which provides a hygienic environmental seal for the internal components. The ratio of the aperture size to the size of the product is important for achieving optimum performance. The sensitivity of the detector is measured at the geometric center of the aperture, which is the least sensitive point. This is inversely proportional to the size of the aperture, in particular, to the smaller of the two sides. In all, there are three coils in the system. The transmitter coil generates a field, rather like a radio transmitter. The response is related to the conductive and magnetic properties of the metal. Control and the Signal Processor Controls can be mounted on the search head itself, or remotely, depending on the design and the application of your system. Where the controls are mounted does not affect the performance of the system. The signal processor is highly sophisticated. First this is amplified by a high performance RF amplifier, then modulated down to low frequency. This provides amplitude and phase information. Finally, the signals are digitized and digitally processed, to optimize the sensitivity. They work by incorporating a tunnel or passage which is subjected to a strong magnetic field and as a result, any magnetic material such as a metal fragment with a ferrous content is magnetized as it passes through. Incorporated in the tunnel are a series of coils. When the magnetized particle passes under them, a current is generated which is then amplified by the electronics of the detection system and this is used to trigger the detection signal output. Secondary effects, due to the movement of any conductive material in a magnetic field, will also generate signals for non-magnetic metals. However, these are small compared to the effect generated by materials with a magnetic content. Consequently, only the largest pieces of non-ferrous metals and stainless steel can be detected. In the majority of applications, this technology is only applicable to the detection of ferrous metals. The User Interface The user interface provides the means of communication with the system, allowing you to set up and to optimize it to operate with the application, environment and mechanical handling systems. Microprocessors have enabled a wide range of communication links, statistical analysis and system information. Configuration Search heads can be used in a variety of configurations. The most common, as shown in diagram 2, is mounted on a driven conveyor which has either a fixed or variable speed. When a contaminated product is detected, it is rejected automatically. Metal Detector search heads can also be configured in a slim-line case and mounted on to the conveyor of a checkweigher. Equally, a search

head can be configured to operate in a freefall mode, where the product moves down through a gravity-based system, as shown in diagram 3. Other search head configurations include those used in pipeline systems for pumped products such as meat and gravity-fed, small aperture systems for items such as tablets. As a result, Loma has an unrivalled level of experience and expertise, in the practice of effective metal detection with food industry production lines. What the System Should Include Your metal detection system needs to be positioned in line with the main production flow, after or at the end of the finished packing point. The system will be unaffected even if there is excessive water or steam at that point. Conveyor based metal detectors must include the following for the most efficient performance: An efficient automatic rejection system A lockable box to receive the rejected product A full enclosure between the search head and the rejection bin A device to confirm that the contaminated products have been successfully rejected into the bin An automatic belt stop failsafe system to activate if there is air pressure failure, a detector fault, failure of the reject system or when the reject product collection bin is full Pipeline systems must include an audible and visual indication of rejection and freefall systems require the facility to produce a double pack, if an automatic reject system is not possible. Alternatively, consider the additional benefits of using x-ray inspection at this point. Sensitivity For optimum sensitivity, the search head must be of the size appropriate for the specified food product. It is important that the best attainable sensitivities are established and set for each product, relating to product size, type and packaging. This process should only be carried out in consultation with the manufacturer of your metal detector. If you move your detection systems within your premises, or if you introduce new products, your system must be re-evaluated. Again, this should be done in consultation with its manufacturer. Many leading retailers will insist that their suppliers of private label goods agree to clarify any changes in metal detection sensitivity settings with them and in writing. Sensitivity adjustment controls must not be accessible to untrained employees. Access should only be given to nominated, fully-trained staff and for additional security, the controls should be password protected or kept locked. Obviously, you will want to maximize the sensitivity of your detection system. Types of Contaminants There are three main groups of metallic contaminants: Ferrous Non-Ferrous Stainless Steel Ferrous is both magnetic and conductive so it is easily detected. Non-ferrous is non-magnetic but a good or excellent conductor so it is relatively easily detected. Stainless steel is the most difficult contaminant to detect as it is usually non-magnetic and a poor conductor. Stainless steel comes in various grades, some of which are magnetic and varying to completely non-magnetic. Their conductivity also varies but is generally low. Both of these factors contribute to poor detectability. Processing plants in the food, packaging and pharmaceutical industries use the two most common grades, L and The detectability of these grades are further hindered when the product is wet, contains a high salt content, or both, which thus contributes to a high product signal. As the properties of stainless can be modified by machining increasing the magnetic effect , specific sensitivity figures are difficult to quote. In general it can be expressed as a ratio to ferrous, at best 1: Further complications are the orientation of contaminants such as screen wires and thin slivers such as swarf if the smallest dimension is smaller than the detectable sphere size. Equipment Testing Procedures Metal detection testing procedures must be clearly documented and communicated to all relevant staff. Testing should take place at the start of each shift, between each change of product and in any circumstance, at least hourly. Intervals between tests need to be short enough that if a fault is found, products potentially affected have not left your premises and can be identified, recalled and retested. Once again, if your company is a private label manufacturer, ensure that you agree upon any variation you make to testing procedures, in writing, with your retailer customers. This feature automatically prompts the operator to carry out the required test at a pre-set interval. Conducting Test Routines When you test conventional metal detection systems, you need to use both ferrous and non-ferrous test packs. These should be made up from packs that are proven to be free from metal and are clearly marked and labelled so they cannot be packed inadvertently for dispatch. You need to make fresh test packs at a frequency that reflects the nature, durability and shelflife of the product concerned. These are convenient and easy to place into your test packs and also make the testing process even more efficient. When you are testing finished packed products on a conveyor system, place the test piece of metal, where possible, at the extreme end of the pack. If this is impractical, for example, if you are testing individual small packs or sandwich wedges, place the test piece of

metal in the center of the product. Next, pass both ferrous and non-ferrous test packs individually through the search head two times. First, with the metal test piece at the leading edge of the pack and then with the test piece at the trailing edge of the pack. In each case, you must observe that the test piece successfully enters the reject bin. In the case of unwrapped products, make every effort to fit metal detection equipment on your production line AFTER products are wrapped. Where this is not possible and you are manufacturing private label goods, it is advisable to agree to the testing routine, in writing, with the retailer concerned. With freefall systems, place ferrous and non-ferrous test pieces independently in the product flow and observe appropriate rejection. This principle applies similarly to pipeline systems. However, where that is not practical within a pipeline system, insert the test piece between the pipe and the search head and then observe for the appropriate rejection. Should any part of your test fail, isolate all products produced since the last satisfactory test and re-screen them, using another detector functioning to the same standard as the original system performing the test. Dealing with Rejected Products Needless to say, no rejected product must ever be returned to the production line. However, this does not include products rejected during normal test procedures. If these products are in a sound condition, you should replace them in the product flow for them to be re-detected. Rejected packs must be investigated by a suitable, trained person, within one hour of rejection. Frozen products must still be frozen, or refrozen. The investigation should be carried out using the metal detector system which initially rejected the products, but not while it is being used in actual production. If you cannot stop the production line, use an off-line detector with at lease the same, if not higher sensitivity. Pass the rejected products through the detector positioned in the same way as they were when they originally went through the search head.

Chapter 2 : â„¢ "Loma metal detector manual" Keyword Found Websites Listing | Keyword Suggestions

Guide to Metal Detection LOMA SYSTEMS Â® offers this guide to metal detection to assist food and packaging companies in establishing an effective metal detection program that meets regulatory guidelines.

Chapter 3 : Loma IQ2 Manuals and User Guides, Metal Detector Manuals â€" www.nxgvision.com

About the metal detector range Freefall versions This section describes Loma Freefall Metal Detectors, designed to detect ferrous and non- ferrous contaminants in products fed by gravity through some form of hopper and pipework into a packaging system.

Chapter 4 : Loma Systems | User Manuals

Loma IQ2 Manuals & User Guides. User Manuals, Guides and Specifications for your Loma IQ2 Metal Detector. Database contains 1 Loma IQ2 Manuals (available for free online viewing or downloading in PDF): Operation & user's manual.

Chapter 5 : Metal Detector Repair Service - Goring Kerr, Safeline, Loma

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Chapter 6 : LOMA IQ3+ USER MANUAL Pdf Download.

Before disconnecting the metal detector from power, removing the power plug or loosening the power terminals ensure that signal cables to other machines are disconnected ï¬•rst.

Chapter 7 : Loma IQ3+ST Manuals

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