THS/21 SERIES

MULTI-SPECTRUM INDUSTRIAL METAL DETECTORS

Fully HACCP and GMP compliant

KEY FEATURES

- **UNIQUE DETECTION CAPABILITY** of magnetic, non-magnetic and stainless steel metal contaminants
- **EXTREMELY HIGH ADAPTABILITY** to any product to be inspected
- **FDA 21 CFR PART 11 COMPLIANT**
  - Data Security
  - Data Integrity
  - Data Traceability
- **RUGGED AISI 316L** stainless steel construction and food-compatible plastic parts **(EU, FDA COMPLIANT)**
- **SUPERIOR WASHDOWN CONSTRUCTION**

***THS/MS21**: MULTI-SPECTRUM TECHNOLOGY FOR EXTREME COMPENSATION OF THE PRODUCT EFFECT*

info@heatandcontrol.com

HEAT AND CONTROL

www.heatandcontrol.com

Quality control at its finest

THS/21 • THS/MS21

METAL DETECTORS SERIES WITH **MULTI-SPECTRUM TECHNOLOGY**

KEY FEATURES

- **Ultra high sensitivity** to all magnetic and non-magnetic metals, including stainless steel
- **Multi-Spectrum Technology** for extreme compensation of the product effect (MS21 version)
- **High immunity** to environmental interference
- **AISI 316L** stainless steel construction to **IP66** and **IP69K** protection levels
- Control Panels listed according to **UL 508A** and **CSA-C22.2** No. 14-05
- **Automatic learning & tracking** of product effect
- **500 product data memories**, selectable by local programming or network software
- **10,000 storable events**
- **Quick Access key** for fast programming of user parameters

THS/SL21 and THS/SLMS21:
Slim Line Metal Detector for applications in limited space.

MULTI-SPECTRUM TECHNOLOGY (MS21 VERSION)

Exclusively developed by CEIA, this is a **unique metal detection technology that both optimises sensitivity** to all metal contaminants and **minimizes product effect** in a very wide range of possible products.

By recognizing the different frequency response of conductive products and metals, this innovative technology cancels product effect and maintains high performance levels for all types of metal contaminants, both magnetic and non-magnetic.

The autolearn function used by CEIA Multi-Spectrum Metal Detectors equates to the repetition of hundreds of conventional transits. It explores the whole spectrum of available frequency bands in order to determine the best operating conditions resulting in unique detection performance.

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THS/G21

METAL DETECTORS SERIES FOR **FREE-FALL** OR **PIPE LINE APPLICATIONS**

***THS/G21-F series** with Reduced Metal Free Zone for limited space installations, while maintaining optimal detection of all metals.*

GENERAL DESCRIPTION

- The **THS/G21** series is designed to inspect powders, granules and other loose materials transported in free-fall through tubes and pipelines.
- When fitted with a deflector, the THS/G21 becomes a system that **detects and removes any contaminating metals, both magnetic and non-magnetic**.
- **Alternatively, when mounted on a packaging machine, the THS/G21 system** is able to send a command to produce a double bag around the contaminated product. This can later be identified and removed from the production cycle automatically.
- Digital analysis of the signal provided by the antenna allows extremely **high levels of sensitivity, immunity to interference and operational stability** to be achieved.
- **The very high detection speed** of the THS/G21 allows the contaminated portion of product to be removed without slowing down the production flow.
- The system is designed to **communicate with external control systems**, either connected directly or via a communications network.

CONTROL POWER BOX

***THS/G21 series** - Standard anti-static pipe sizes available to suit all applications (ATEX ZONE 21 version available)*

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THS/21 Metal Detection Systems offer detection, construction quality and reliability characteristics that make them the most suitable and effective solution to automatic elimination of metal contaminants.

Fully HACCP and GMP compliant, CEIA Metal Detectors are manufactured according to **ISO 9001 certified** Quality System using **EC** and **FDA approved** materials.

FDA 21 PART 11 COMPLIANT

The THS 21 Metal Detector Series is a high-sensitivity, high-precision measuring instrument. **The data relating to each detection and ejection are stored in an events memory and certify production quality, the inspection itself and programming operations**, as well as the periodic functional test phases using standard test samples.

FDA Code Title 21 Part 11 prescribes rigorous criteria for access to programming and computer data protection which have been fully adopted in the CEIA THS 21 Series firmware.

The requirements regarding Security, Integrity and Traceability are therefore satisfied.

FDA 21 CFR PART 11 COMPLIANT
FOR DATA SECURITY, INTEGRITY, AND TRACEABILITY

REAL-TIME EMBEDDED
SELF-CALIBRATION CONTROL

EXCLUSIVE GLOBAL
AUTO-LEARN SYSTEM

INCREASE IN
SENSITIVITY PERFORMANCE

CONTINUOUS
AUTO-TEST FUNCTION

AUTOMATIC VERIFICATION OF THE INSTALLATION
QUALITY AND ENVIRONMENTAL COMPATIBILITY

BT

IXC MODULE
ADVANCED CONNECTIVITY

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EXCLUSIVE **AUTO-LEARN SYSTEM**

The THS 21 Series employs an exclusive Auto-Learn system for food products which provides simultaneous maximum sensitivity to all metals starting from a single learning transit.

The system allows optimization of the detection sensitivity to all metals with the maximum speed and precision, equivalent to hundreds of conventional learning transits: these results in levels of precision and efficiency have never been obtained before.

For products with changing or varying product signal after autolearn, the THS 21 Series includes an advanced autolearn function that runs in the background, to capture this product signal during normal production while still detecting metal. When the recording is ended, the operator has the option to analyze the data immediately, or wait until a later time when the line is stopped so as not to interrupt production.

The data that was added during the background autolearn is analyzed, along with the original autolearn data, and the detection parameters are modified in order to also cancel the varying product signal.

REAL-TIME EMBEDDED **SELF-CALIBRATION CONTROL**

The Self-Calibration control allows maximum repeatability and performance consistency over time and with environmental changes. By means of specific signals sent to the transmission and reception chain of the Metal Detector, constant monitoring of the detection characteristics is carried out, with consequent constant compensation for any variations caused by environmental factors. The result is system stability and constancy in detection performance and product effect neutralization.

AUTOMATIC VERIFICATION OF THE INSTALLATION QUALITY AND ENVIRONMENTAL COMPATIBILITY

THS 21 Series introduces new tools for the installation and maintenance technicians which allow them to measure the environmental compatibility of the Metal Detector.

The measurements include general mechanical and electromagnetic environmental compatibility, specific electromagnetic compatibility and the automatic examination of the degree of metal interference from the conveyor belt.

This latter function becomes even more important when the high level of sensitivity of the THS 21 Metal Detector Series is taken into consideration..

INCREASES IN PRODUCTIVITY AND **COST SAVINGS**

- INCREASED DETECTION SENSITIVITY
- REDUCED PRODUCT WASTE
- FEWER OPERATOR INTERVENTIONS
- FEWER PRODUCT ACQUISITION PROCEDURES
- REDUCTION IN LINE STOPPAGES
- NO PERIODIC CALIBRATION

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MODERN, RUGGED AND USER FRIENDLY INTERFACE

KEY FEATURES

- Industrial rate design
- Rapid data entry with extended keyboard
- Easy to read, high-contrast graphic display
- Rugged, antivandalic stainless steel keyboard

  Organic graph display with extremely high contrast (3000:1) and a viewing angle up to 180°, and an extended alphanumeric keypad for quick keystrokes.

- Quick Access Function

  A new function, activated simply by pressing a dedicated key, allows the most frequently-used functions to be directly recalled. These functions are programmable by the operator.

- Large Product Memory: 500 entries with easy alphabetical sorting and pattern matching

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THS PRODUCTION 4.0

ENABLING INDUSTRY 4.0

The THS Production 4.0 software provides **acquisition and report capability** for THS 21 Metal Detection Systems

SMART FACTORY

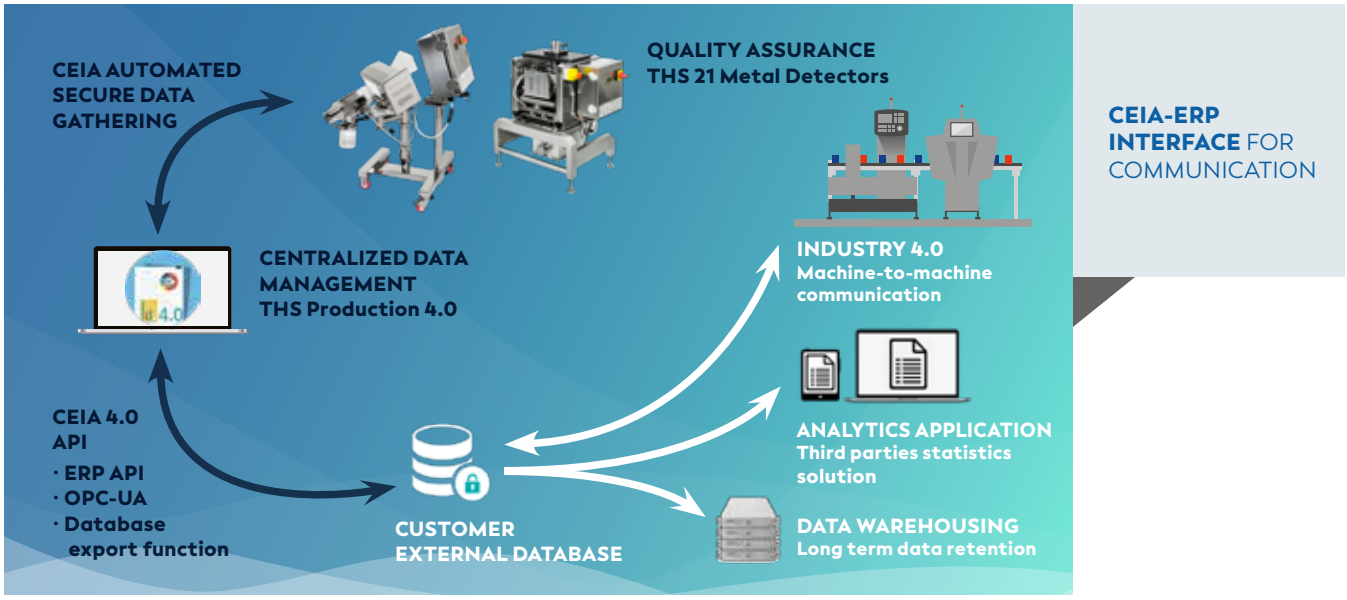
- CEIA-ERP API interface for communication to the factory management software(Microsoft Dynamics NAV, SAP, ORACLE ERP)
- OPC-UA protocol API for Metal Detector Monitor and Control
- Connection to an External Database and Definition of a Programmable Block of SQL Instructions for each Metal Detector Event
- Compatible with standard SCADA Systems
- E-mail sender for Metal Detector events
- Integrated Web-Server Appliance for real-time monitoring for HMI and touch panel

PREDICTIVE MAINTENANCE

- Data Inspector Tool for signal and production analysis (enhanced option)
- Early Metal Explosion identification

THS PRODUCTION 4.0 HIGHLIGHTS

- Connects and Acquires Data from Multiple THS Detectors via wired or wireless LAN (requires IXC module)
- Enables Data Base Management and Back-Up of Metal Detector events
- Report Data Exportable in HTML, CSV and PDF formats
- Provides User Authentication and Manages Electronic Signatures and Records
- Allows Data Integrity and Operator Auditing
- FDA Requirements Compliant, Title 21 of the Code of Federal Regulations (CFR)
- High performance 64-bit database that handles more than 500 millions events



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SOPHISTICATED **INTERFACE CAPABILITIES**

NETWORK COMMUNICATION

The Metal Detector can be linked to an Ethernet network (optional IXC module required).

In association with the THS Production Plus Software it enables remote management of production, collection of all technical and operational events, generation of statistical and traceability reports in compliance with FDA 21 CFR part 11 requirements.

BT CONNECTIVITY

BT

In the THS/21 Series, local connection to the maintenance technician's computer no longer requires physical access to the interior of the detector or the use of unwieldy connection cables.

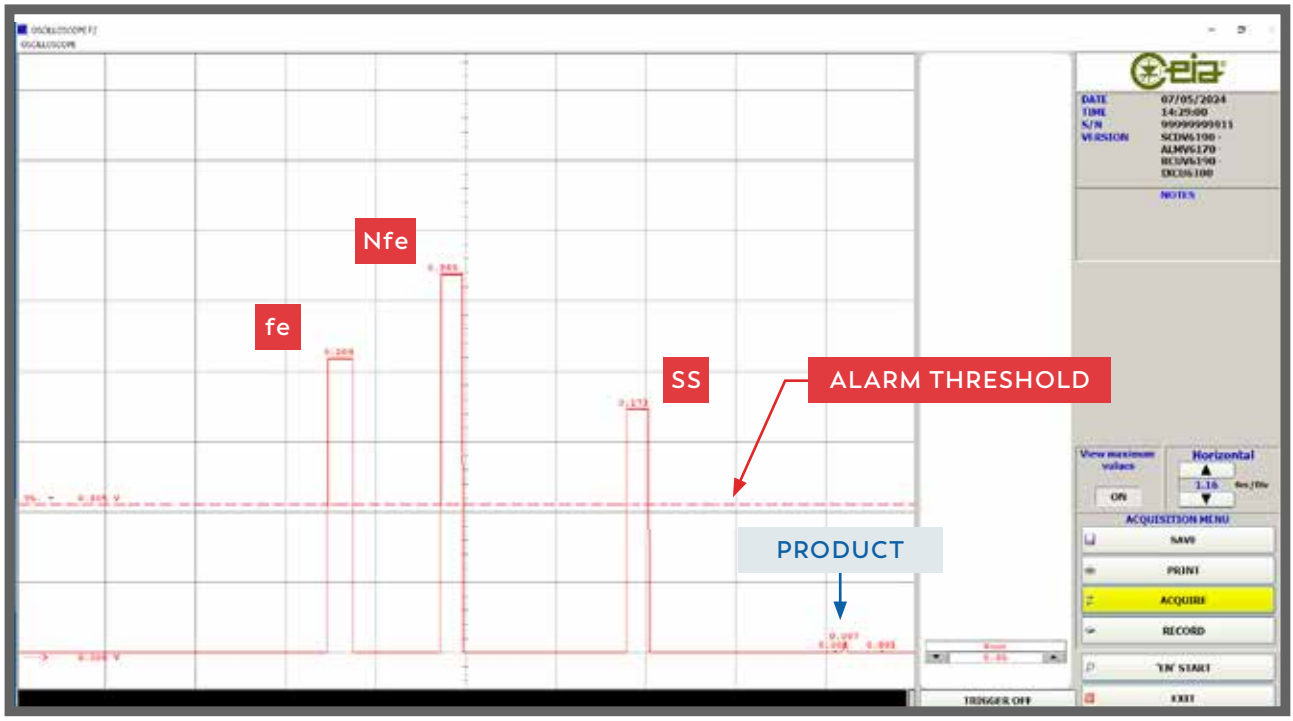
The BT connection can be used for programming, monitoring of the signals via the CEIA MD-Scope program and the transfer of the data contained in the Metal Detector's events memory.

MD-SCOPE

Software Diagnostic Package complete with connecting cable and hardware key:

- **REMOTE PROGRAMMING**
- **INPUT/OUTPUT SIGNALS**
- **DETECTED AND ALARM SIGNALS**
- **OSCILLOSCOPE FUNCTIONALITIES**

EXAMPLE OF SIGNAL DURING TEST



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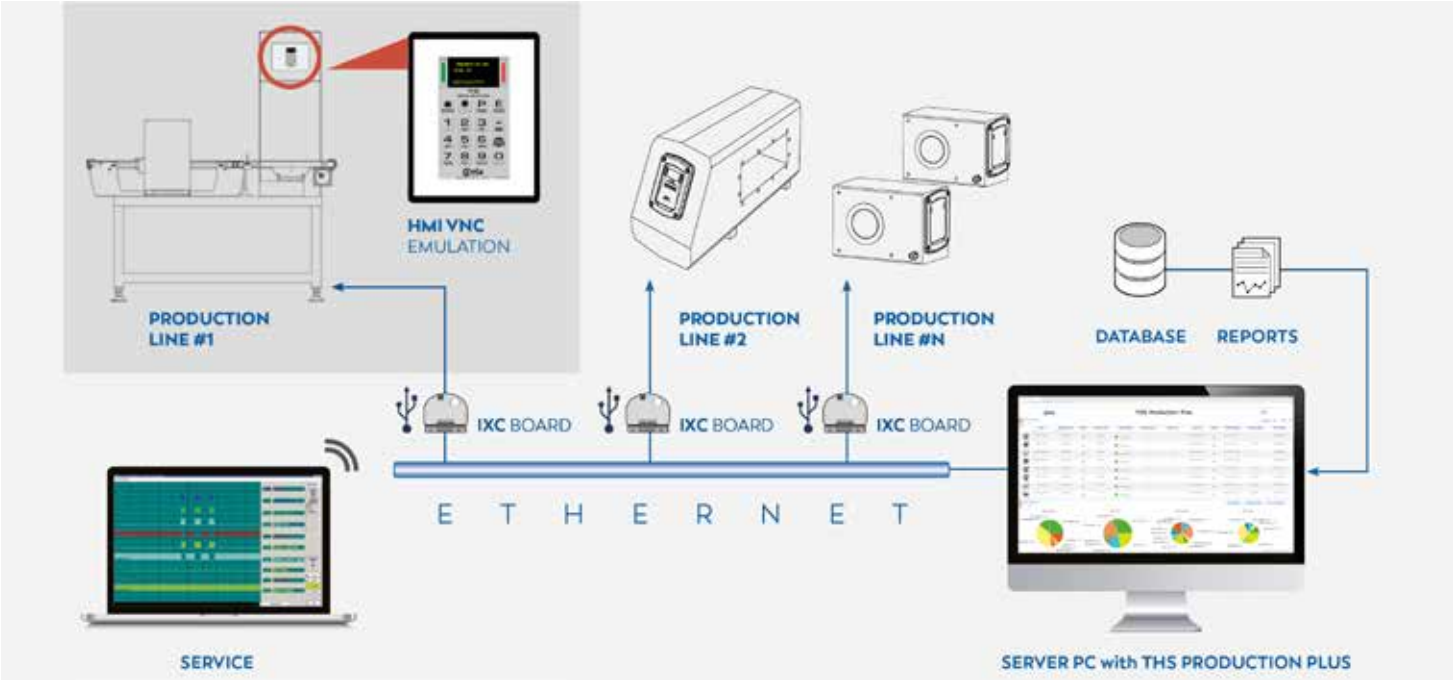
IXC MODULE ADVANCED CONNECTIVITY

ETH / WI-FI	USB	INTERFACES
✔		**BUILT-IN MD SCOPE** - Metal Detector signal and remote programming terminal
✔		**STATUS** - Replicates every message displayed by the THS (updated each 5 s)
✔		**PRODUCTS** Displays the list of products stored into the THS memory, the selected product is shown in green. This page allows the product to be changed
✔	✔	**PRODUCTS EXPORT** Allows selection of all or part of the products stored in the THS memory in order to export them
✔	✔	**PRODUCTS IMPORT** - Allows importation of all or part of the products exported
✔	✔	**BUFFER EXPORT** - Allows exportation of events occurred in a selected time frame
✔	✔	**CONFIGURATION BACKUP/RESTORE** Backup and restoring of the Metal Detector configuration
✔	✔	**CONFIGURATION EXPORT/IMPORT** Allows the configuration to be exported or imported from other Metal Detectors of the same model, installed on the same line
✔		**HMI** emulation by **VNC** client
✔		**EtherNet/IP** interface (optional)



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AUTOTEST AND **AUTO-QC™ TEST** FUNCTIONS

Industrial Metal Detectors for food application are usually equipped with basic diagnostic functions based on their emitter/receiver signals monitoring.

This type of diagnosis is not able to detect aging as well as thermal drift and other sources of minor deviations. Any of the above may result on a sensitivity reduction that could lead to non-detection of metal contamination.

THS/21 & **THS/MS21 SERIES** METAL DETECTORS ARE NATIVELY EQUIPPED WITH AN **ADVANCED AUTOTEST FUNCTION** ENSURING THE FOLLOWING FEATURES:

- **CONTINUOUS BACKGROUND REAL-TIME MONITORING** and **STABILIZATION** of the amplitude and phase response for each working frequency

- **CONTINUOUS COMPENSATION** of environmental and age-related changes

- **IMMEDIATE ALERTING** in case of permanent out of standard conditions

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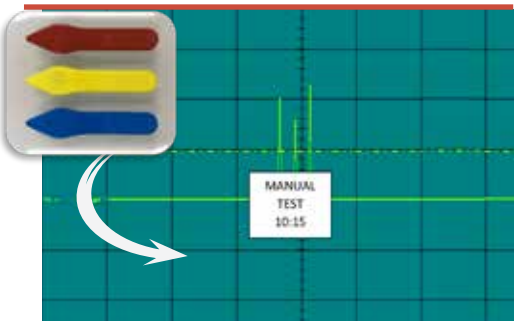
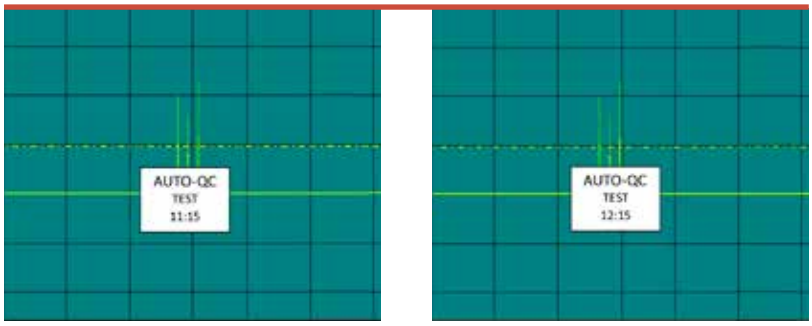
In addition to the AUTOTEST function, THS/21 and THS/MS21 detectors can be programmed so that **periodic verifications of the calibration are carried out automatically. This feature is called AUTO-QC™ TEST**.

AUTO-QC™ TEST EXAMPLE

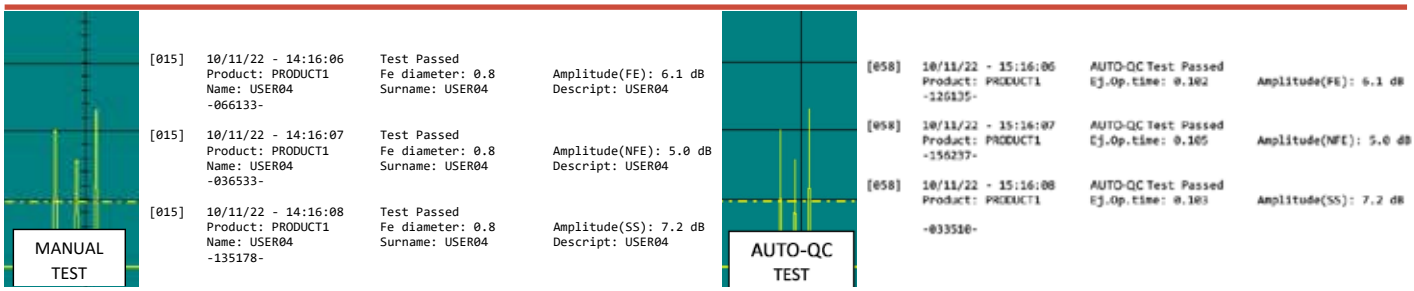
AT 10:15 A MANUAL TEST, after product setup, is requested during which the Metal Detector records the signals of three user-defined Test Samples.



AT 11:15 AND 12:15 THE METAL DETECTOR PERFORMS TWO AUTO-QC TESTS, providing the previously recorded signal stimuli to the probe-emitter-receiver system and verifying the actual detection and product ejection (if applicable).



*The example below shows an **extract of the Metal Detector Events Buffer** relevant to a manual and AUTO-QC test:*



AUTO-QC™ BENEFITS

- The **AUTO-QC TEST** allows the manual verification of calibration by the operator to be reduced or eliminated
- The **METAL DETECTOR** provides a programmable output that can be connected to the conveyor line stop during the AUTO-QC test to avoid product ejection and waste during automatic test
- **CEIA AUTO-QC TEST provides an effective calibration check along with a programmable 0 ÷ 100 % reduction of the manual verifications**, resulting in a corresponding reduction of:
  - LABOUR COST
  - ACCIDENTAL PRODUCT CONTAMINATION
  - PRODUCT WASTE

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SPECIFICATIONS

GENERAL CHARACTERISTICS	High-contrast OLED display:	Alphanumeric, 4x20 chars	
	Programming keyboard, in stainless steel:	16 keys	
	Metal detection sensitivity:	Very High	
	Display of the signal level by means of bar graph		
	Autolearn and automatic tracking of the product effect		
	Complies with HACCP and GMP criteria		
	Metallic structures in AISI316. Parts in contact with the product in plastic materials, certified for food use, according to FDA and USDA specifications		
SUPPLY	Control Power Box	Mains voltage: 100-240 VAC	
		Frequency and phase: 50/60 Hz - single phase	
		Full load current (FLA): 2.2 A	
	Conveyor Control System	Mains voltage	115V version: 100÷120 VAC
			230V version: 200÷240 VAC
		Frequency	50/60 Hz - single phase
		Full load current (FLA)	115V version: 11.8 A
			230V version: 12.9 A
		Maximum power of the three-phase pilotable motor	115V version: 0.37 kW (0.5 hp)
			230V version: 0.75 kW (1 hp)
	Small-size power supply card	Power supply voltage	20÷30 Vdc o Vac; 2A max.
DATA MANAGEMENT	Management of electronic production data and electronic signatures compliant with the requirements indicated by CFR 21, Part 11	Data security	
		Data integrity	
		Data traceability	
DATA STORAGE	Max number of Products	500	
	Max number of Events	10,000 (100,000 with IXC)	
I/O INTERFACES	RS232 and auxiliary RS232 serial ports	Built-in	
	BT Wireless interface	Built-in (v2.1, Class 2)	
	Serial port for barcode reader	Integrated (9600 bps, 8N1 format), enabled upon request	
	IXC Network card (optional) with built-in Web Server	Wi-Fi: On USB key; Wireless standard: IEE 802.11 b/g/n; Frequency: 2.400-2.4835 GHz; WPA2 security; Max range: up to 20m in open areas, subject to limitations	
		Ethernet: 2 ports 10/100 baseT; IP Protocol: static/DHCP	
		USB: V2.0 (only for data storage on USB memory devices, FAT32 formatted)	
		Field Bus: Ethernet/IP (optional)	
PROTECTION DEGREE	THS/21 series	IP66 – IP69K	On UL versions, the Control Power Box and Conveyor Control System have a type 4X-12 certified degree of protection
ENVIRONMENTAL CONDITIONS	Temperature	Operating	14°F to 131°F
			41°F to 104°F (UL508A version)
		Storage	-40°F to 158°F for short periods, not more than 24h
	Relative humidity	Operating	5% ÷ 90%, non-condensing
		Storage	5% ÷ 90%, non-condensing

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