THS/21ET SERIES

MULTI-FREQUENCY INDUSTRIAL METAL DETECTORS

Fully HACCP and GMP compliant

KEY FEATURES

- **SUPERIOR 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)**
- **WASHDOWN CONSTRUCTION**

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Quality control at its finest

THS/21ET • THS/21ET-3F

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

KEY FEATURES

- **High sensitivity** to all magnetic and non-magnetic metals, including stainless steel
- **Multi-frequency Technology** for maximum sensitivity on multiple product lines (3F version)
- **High immunity** to environmental interference
- **AISI 316L** stainless steel construction to **IP65** protection level
- Control Panels listed according to **UL 508A** and **CSA-C22.2** No. 14-05 (on request)
- **Automatic learning & tracking** of product effect
- **250 product data memories**, selectable by local programming or network software
- **1000 storable events**
- **Local programming: 4 keys, 3 with double function**

THS/SL21ET
Slim Line Metal Detector for applications in limited space.

MULTI-FREQUENCY TECHNOLOGY (3F VERSION)

The Multi-Frequency Technology allows maximum sensitivity for detection of contaminating metals, both magnetic and non-magnetic, including high-resistivity stainless steels, to be maintained.

An automatic selection function allows the Metal Detector to choose the optimum frequency for the product in transit during the autolearn phase.

The automatic tracking function eliminates any further variations due to the "Product Effect". The wide pass band of the Metal Detector allows operation at maximum sensitivity at both slow and fast speeds.

The digital analysis of the signal provided by the probe allows the user to achieve extremely high sensitivity, immunity to interference and operational stability.

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THS/G21ET

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

***THS/G21ET-F series** with Reduced Metal Free Zone for limited space installations, while maintaining optimal detection of all metals.*

GENERAL DESCRIPTION

- The **THS/G21ET** 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/G21ET** becomes a system that **detects and removes any contaminating metals, both magnetic and non-magnetic**.
- **Alternatively, when mounted on a packaging machine, the THS/G21ET 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/G21ET** 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/G21ET series** - Standard anti-static pipe sizes available to suit all applications.*

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THS/21ET 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/21ET** 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 **THS/21ET** 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

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/21ET 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 high levels of precision and efficiency.

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 consistency in detection performance and product effect neutralization.

AUTOMATIC VERIFICATION OF THE INSTALLATION QUALITY AND ENVIRONMENTAL COMPATIBILITY

THS/21ET 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/21ET** Metal Detector Series is taken into consideration..

INCREASES IN PRODUCTIVITY AND **COST SAVINGS**

- 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
- Easy to read, high-contrast graphic display
- Rugged, antivandalic stainless steel keyboard
- Large Product Memory: 250 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

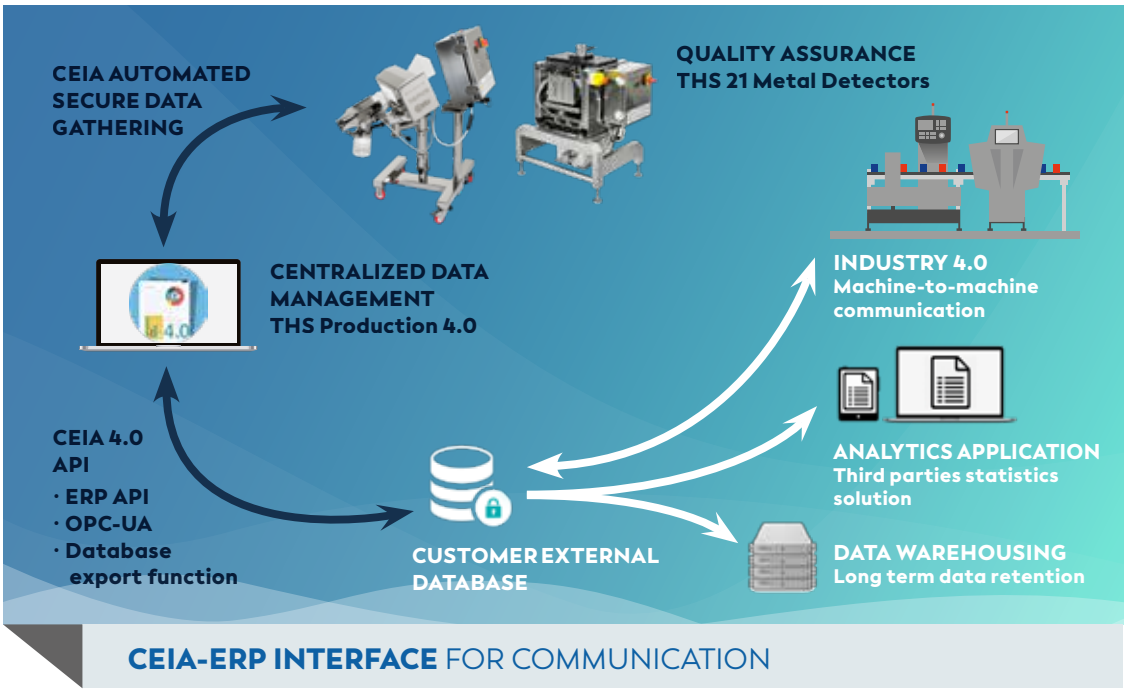
- CEIA-ERP API interface for communication to the factory management software (Microsoft Dynamics NAV, SAP, ORACLE ERP)
- OPC-UA protocol API for Metal Detector Monitor and Control
- Connection to an External Database and Definition of a Programmable Block of SQL Instructions for each Metal Detector 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.

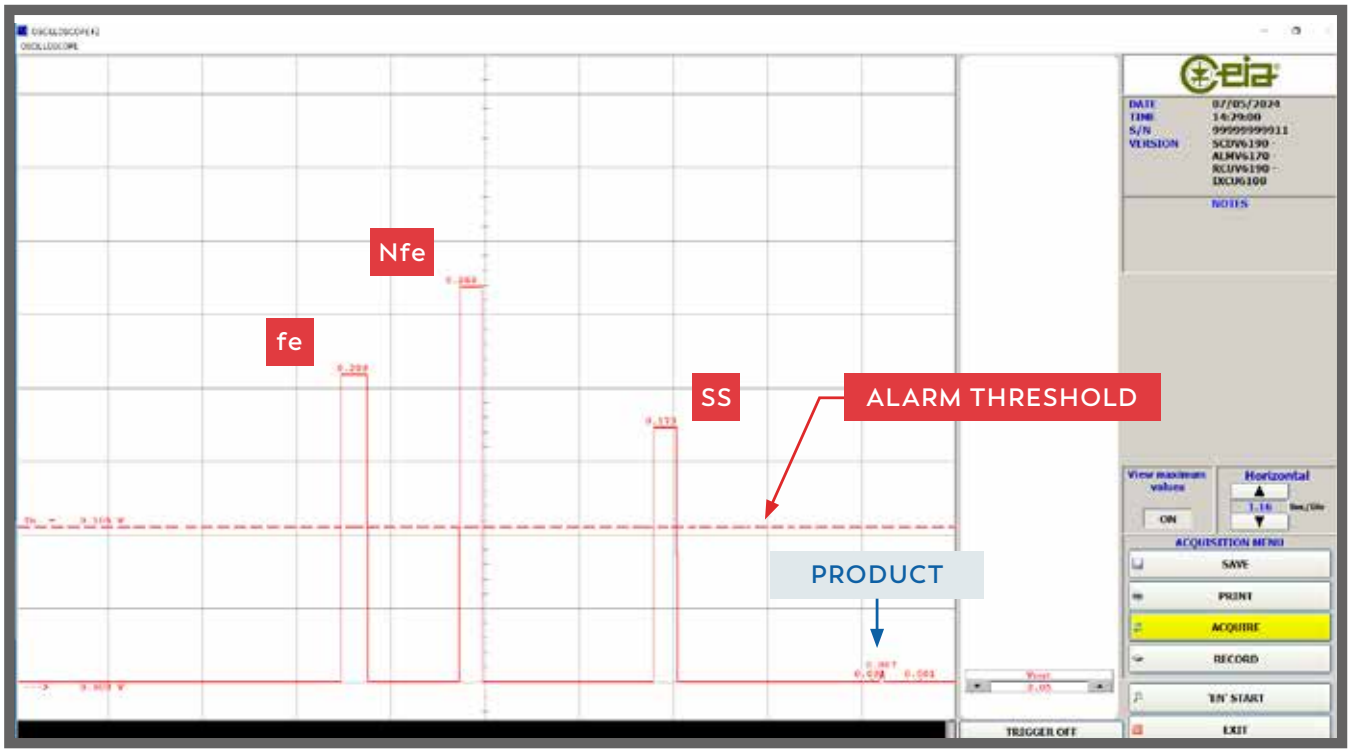
The BT connection can be used for programming, monitoring of the signals via the CEIA MD-Scope program and the transfer of the data contained in the Metal Detector's events memory.

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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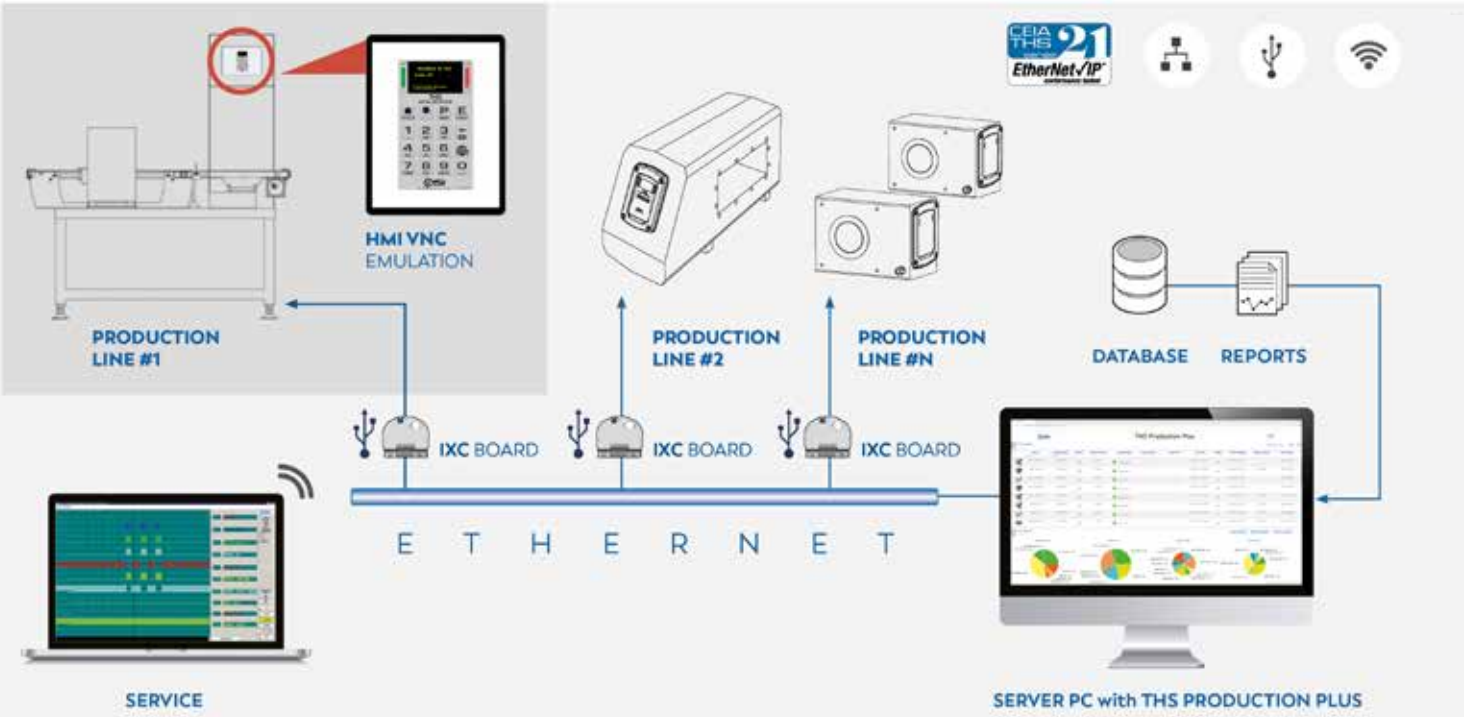
IXC MODULE ADVANCED CONNECTIVITY

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/21ET 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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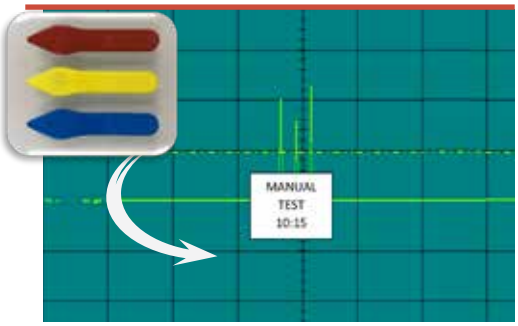
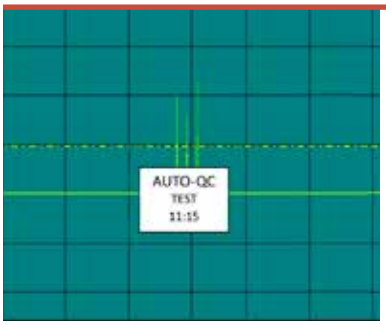
In addition to the AUTOTEST function, THS/21ET and THS/ET-3F detectors can be programmed so that **periodic verifications of the calibration are carried out automatically. This feature is called AUTO-QC™ TEST**.

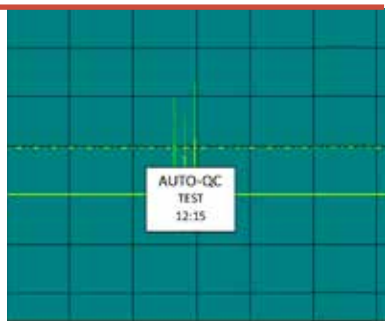
AUTO-QC™ TEST EXAMPLE

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.

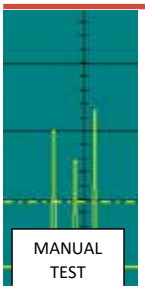


AT 11:15 AND 12:15 THE METAL DETECTOR PERFORMS TWO AUTO-QC TESTS, providing the previously recorded signal stimuli to the probe-emitter-receiver system and verifying the actual detection and product ejection (if applicable).





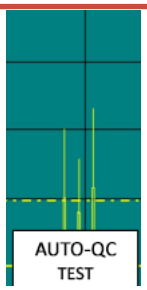
*The example below shows an **extract of the Metal Detector Events Buffer** relevant to a manual and AUTO-QC test:*




```
[015]   10/11/22 - 14:16:06     Test Passed
        Product: PRODUCT1       Fe diameter: 0.8        Amplitude(FE): 6.1 dB
        Name: USER04            Surname: USER04         Descript: USER04
        -066133-

[015]   10/11/22 - 14:16:07     Test Passed
        Product: PRODUCT1       Fe diameter: 0.8        Amplitude(NFE): 5.0 dB
        Name: USER04            Surname: USER04         Descript: USER04
        -036533-

[015]   10/11/22 - 14:16:08     Test Passed
        Product: PRODUCT1       Fe diameter: 0.8        Amplitude(SS): 7.2 dB
        Name: USER04            Surname: USER04         Descript: USER04
        -135178-
```




```
[058]   10/11/22 - 15:16:06     AUTO-QC Test Passed
        Product: PRODUCT1       Ej.Op.time: 0.102       Amplitude(FE): 6.1 dB
        -126135-

[058]   10/11/22 - 15:16:07     AUTO-QC Test Passed
        Product: PRODUCT1       Ej.Op.time: 0.105       Amplitude(NFE): 5.0 dB
        -156237-

[058]   10/11/22 - 15:16:08     AUTO-QC Test Passed
        Product: PRODUCT1       Ej.Op.time: 0.103       Amplitude(SS): 7.2 dB

        -033510-
```

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:	Graphical, 128x64 pixels	
	Programming keyboard, in stainless steel:	4 keys	
	Metal detection sensitivity:	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	24 Vdc: 2.5A 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	250	
	Max number of Events	1000 (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	(optional)	
	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/21ET series	IP65	On UL versions, the Control Power Box and Conveyor Control System have a type 4X-12 certified degree of protection
ENVIRONMENTAL CONDITIONS	Temperature	Operating	-10°C to +55°C (CE version)
			+5°C to +40°C (UL508A version)
		Storage	-40°C to +70°C - for short periods, not more than 24h
	Relative humidity	Operating	5% ÷ 90%, non-condensing
		Storage	5% ÷ 90%, non-condensing

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