

Industrial Metal Detectors THS/21E - THS/21

Operator Manual

Document	Date	Hardware	Software
FI002K0024v1400xUK	12/09/2018	HV5.xx	THSV5441 – ALMV5430 THSV5741 – ALMV5730



Please read this manual thoroughly before you start to install, operate or maintain the equipment. Keep this manual in good condition and in a safe place. The manual must be kept with the machine until decommissioning and disposal. In the event of a change of ownership, the manual should be given to the new owners.

SYMBOLS



The equipment is marked with this pictogram in those places where the user is advised to refer to this instruction manual to prevent damage to the equipment. The pictogram also appears in the manual to indicate safety precautions, important operating instructions and other items of important information.



The equipment is marked with this pictogram in areas where high voltages are operating. Only skilled maintenance personnel are permitted to work in these areas. This pictogram also appears in the manual where instructions or warnings are provided concerning these areas.



The equipment is marked with this symbol in the areas where there is a crushing hazard to the hands. Only skilled maintenance personnel are permitted to work in these areas. This pictogram also appears in the manual where instructions or warnings are provided concerning these areas.



The equipment is marked with this symbol in those areas where there is a hazard from contact with moving parts. Only skilled maintenance personnel are permitted to work in these areas. This pictogram also appears in the manual where instructions or warnings are provided concerning these areas.



The equipment is marked with this symbol in the areas where there is a crushing hazard to feet. Only skilled maintenance personnel are permitted to work in these areas. This pictogram also appears in the manual where instructions or warnings are provided concerning these areas.



The equipment is marked with this symbol in the areas where there is a hazard of unexpected bursts of compressed air. Only skilled maintenance personnel are permitted to work in these areas. This pictogram also appears in the manual where instructions or warnings are provided concerning these areas.



LASER LIGHT: This symbol appears in this manual at those points where warnings or information relating to devices with laser light beams are given. **These devices may be hazardous. Do not look into the laser beam!**



The equipment is marked with this symbol in those areas where insertion of hands, other body parts or objects, is not permitted, in order to avoid system malfunctions or dangerous situations.



The equipment is marked with this symbol in the areas where it is forbidden to extinguish a fire with water.



CEIA Metal Detectors employ low intensity electromagnetic fields in compliance with current legislation. **MAGNETIC FIELDS** can affect pacemakers. Persons wearing pacemakers, cardiac defibrillators and other life support devices must not operate close to the detection probe. Wearers of pacemakers must not use the Metal Detectors of the THS/MN21 series which use static electromagnetic fields. Persons wearing pacemakers who may need to approach this equipment should consult their medical practitioner beforehand.



The equipment is marked with this pictogram in those places where the user is advised to refer to this instruction manual before any operation.



This symbol appears in the manual where additional information, suggestions or other important notes are provided.

LIST OF REVISIONS

Version	Date	Author	Reference	Description
1000	11/05/2011	TP2 – SP	-	First issue
1100	30/03/2012	TP2 – SP	-	Small corrections, introduction, management of external emergency buttons, maximum weight for reject bins, software update
1200	2013-05-27	TP2 – SP	-	Software update to THSV5412
1300	2015-11-17	TP2 – SP	-	Software update to THSV5436, ALMV5420 Deleted some models – Added model THS/RB
1301	2017-06-27	TP2 – SP	-	Minor corrections
1400	2018-09-12	TP2 – SP	-	Software update to THSV5441, ALMV5420 and THSV5741, ALMV5740
				Addition of Application Field paragraph
				Addition of new models

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Terms of Warranty

All C.E.I.A. equipment has a 12-month warranty. The warranty period starts from the date of delivery. The warranty covers the material as supplied ex-works. The warranty guarantees all components, except batteries, against defects. The warranty does not cover damage to the equipment caused by improper use or by failure to follow the instructions in this manual. Any form of tampering with the device and, in particular, opening its container, is strictly forbidden and will invalidate the warranty.

Customer Satisfaction feedback form

CEIA operates a policy of continuous improvement to guarantee the maximum quality of its products and services.

Your suggestions and comments about our products and services are an important part of the improvement process and we would be grateful if you could complete the Customer Satisfaction form on the CEIA website at:

<http://www.ceia.net/industrial/satisfaction>

Application field

This document applies to the following CEIA models:

Metal Detectors

- THS/21E, THS/SL21E, THS/21E-3F, THS/SL21E-3F
- THS/21, THS/SL21, THS/MS21, THS/SLMS21
- THS/MN21
- THS/G21E, THS/G21, THS/GMS21

Integrated inspection systems

- THS/FBB, THS/MBB, THS/FBBV, THS/FBV, THS/MBR, THS/RB, THS/RBK, THS/CONV
- THS/FFV21E, THS/FFV21
- THS/PL21E, THS/PLH21E, THS/PL21, THS/PLH21
- THS/PLV21E, THS/PLV21, THS/PLVM21E, THS/PLVM21

Introduction

All rights reserved. CEIA S.p.A. Copying in part or in whole, modification and translation of this document are forbidden.

CEIA S.p.A. reserves the right, at any time and without prior notice, to make modifications to the models (including programming), accessories, optionals, prices and conditions of sale.

The Metal Detector and the CEIA integrated system must be used only for the purposes and in the ways described in this manual. CEIA declines all liability for damage or injury caused by improper use and use of the equipment for purposes other than those specified in this manual.

About this documentation

The documentation for a CEIA Metal Detector comprises a set of manuals whose purposes are described in the sections below:

Warnings Manual

The safety instructions specify the safety precautions to be implemented when installing and operating CEIA products. These instructions must be implemented throughout the life cycle of the product.

Installation, Use and Maintenance Manual

The Installation, Use and Maintenance Manual provides information about the following:

- Installation of the Metal Detector or CEIA integrated system in accordance with the electrical and mechanical instructions specified by CEIA.
- Configuration of the Metal Detector for the intended type of installation and use.
- Correct use of the conveyor belt system.
- Ordinary and extraordinary maintenance procedures.

Programming Manual

The Programming Manual describes all the items on the System Programming menu for the following functions:

- Define the users authorized to operate the system.
- Program the Metal Detector for the type of product to be inspected.
- Create remote connections with the Metal Detector, using the communication interfaces available.

Operator Manual

The Operator Manual provides all the information the operator needs to operate the system efficiently on a daily basis.

List of Options, Accessories and Spare Parts

This document provides a rapid reference table to facilitate the ordering of spare parts, optional and accessories.

1 SAFETY INSTRUCTIONS - PRECAUTIONS



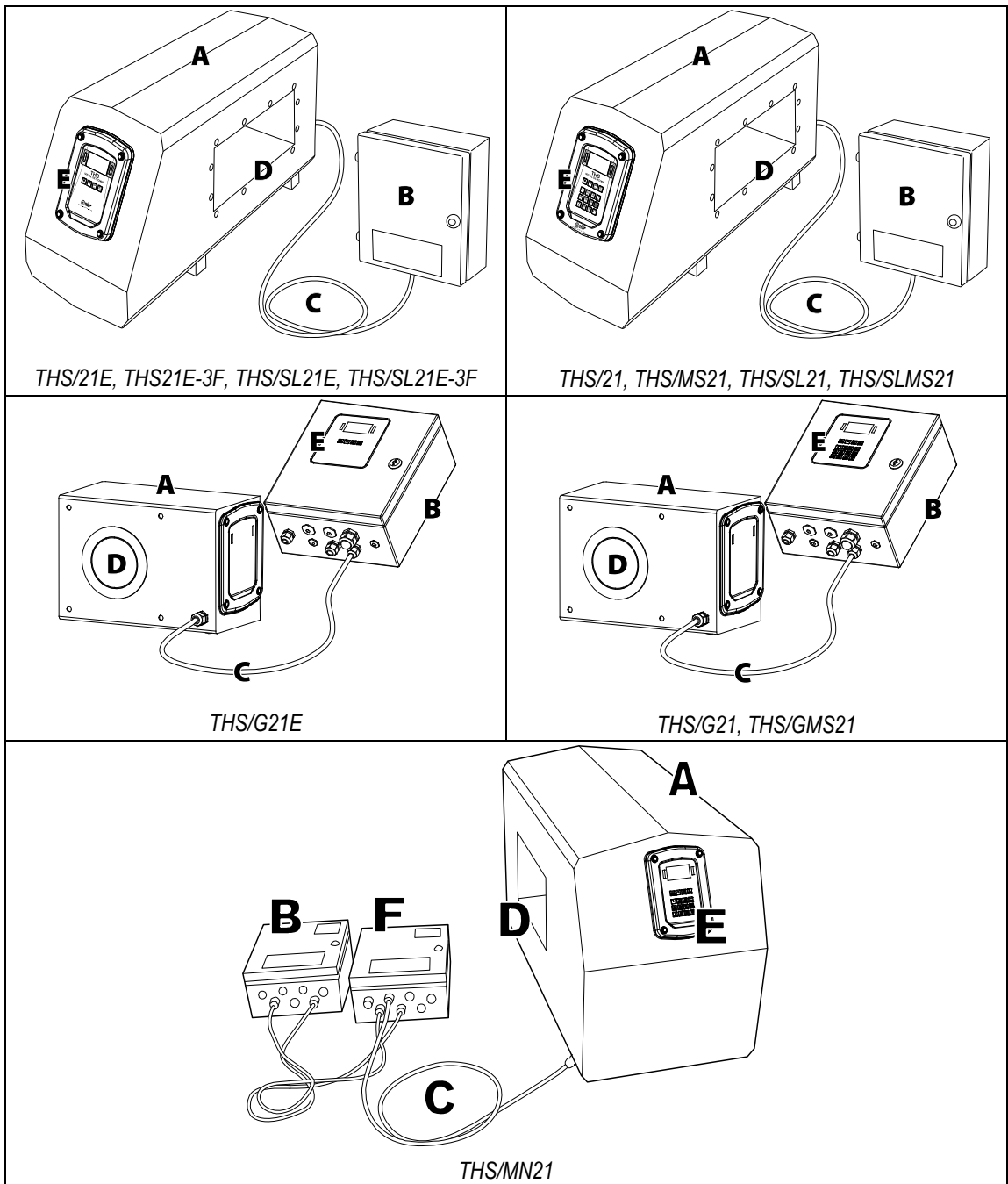
Before you install, operate or maintain this equipment, read all the safety instructions and precautions specified in the Warnings Manual.

The equipment may only be used for its intended purpose, in accordance to the Safety Instructions and to the operating and maintenance procedures described in this Manual and in the Installation, Use and Maintenance Manual.

Any other use than the intended use is to be considered improper or require the approval of the Manufacturer.

2 DESCRIPTION

2.1 Detection probes

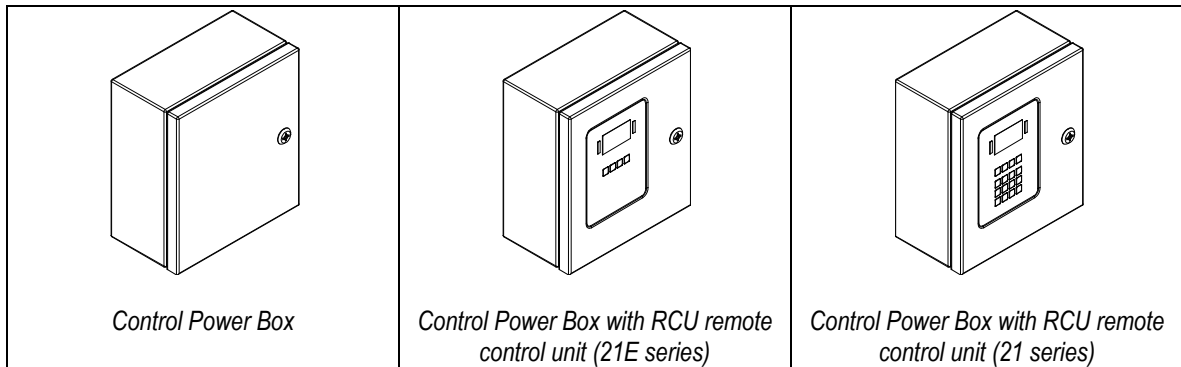


- A** Detection probe, complete with electronic control card (SCD)
- B** Power supply unit for connecting the device to the mains power supply and to any external units (photocell, ejector, etc.).
- C** Connecting cable
- D** Transit tunnel
- E** Control panel fitted with display and programmer keypad
- F** Field generator

2.2 Power supply and control units

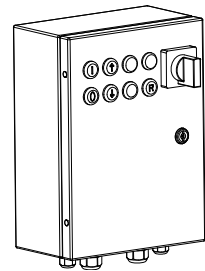
2.2.1 Control Power Box (CPB)

The Control Power Box contains the Metal Detector power supply unit. It has connections for external sensors and slave devices and can also house the RCU remote control unit or the IXC Network Card (optional).



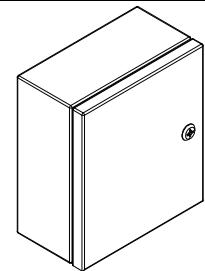
2.2.2 Conveyor Control System (CCS)

This unit has the same functions as the Control Power Box and in addition has a conveyor driver and control section for the conveyor belt motor.



2.2.3 Field generator (MAG)

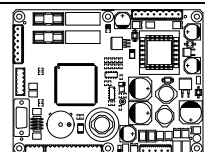
This unit is fitted alongside the standard power supply unit on the THS/MN21 model. It is not available for other models.



2.2.4 Small Power Supply Unit (AL)

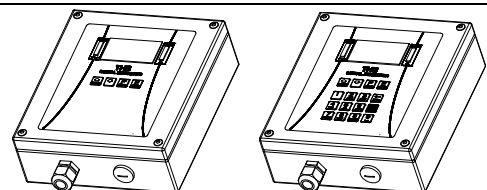
The 00211AL_ card is used in OEM applications, for integration in customer systems.

The card requires a power supply voltage of 24 V (20-30 V DC).



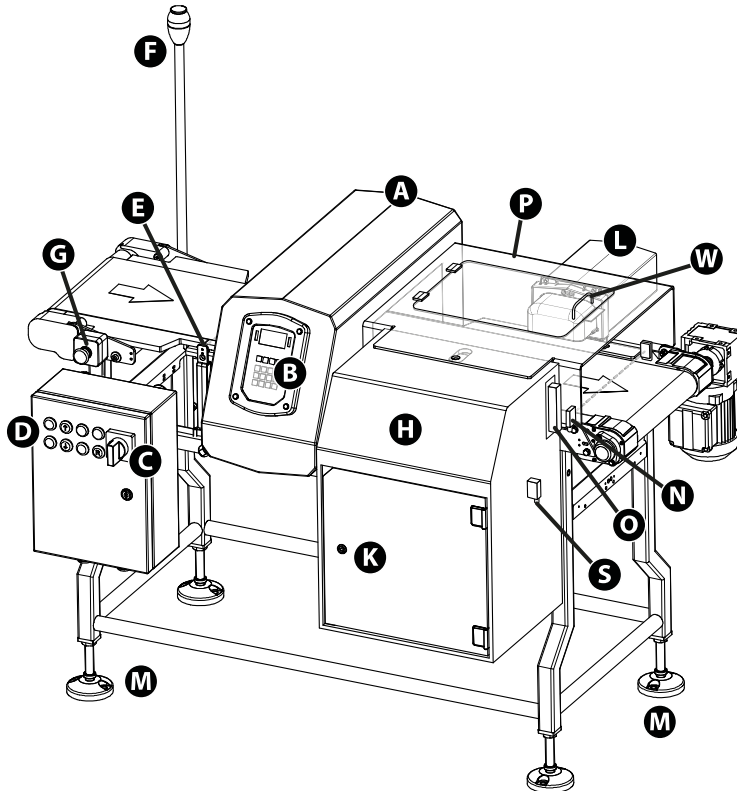
2.2.5 Remote Control Unit (RCU)

Metal Detector can be fitted with an optional remote control unit. The RCU is designed for all those applications where the detection probe and the power supply unit are installed in positions which are difficult for the operator to reach.



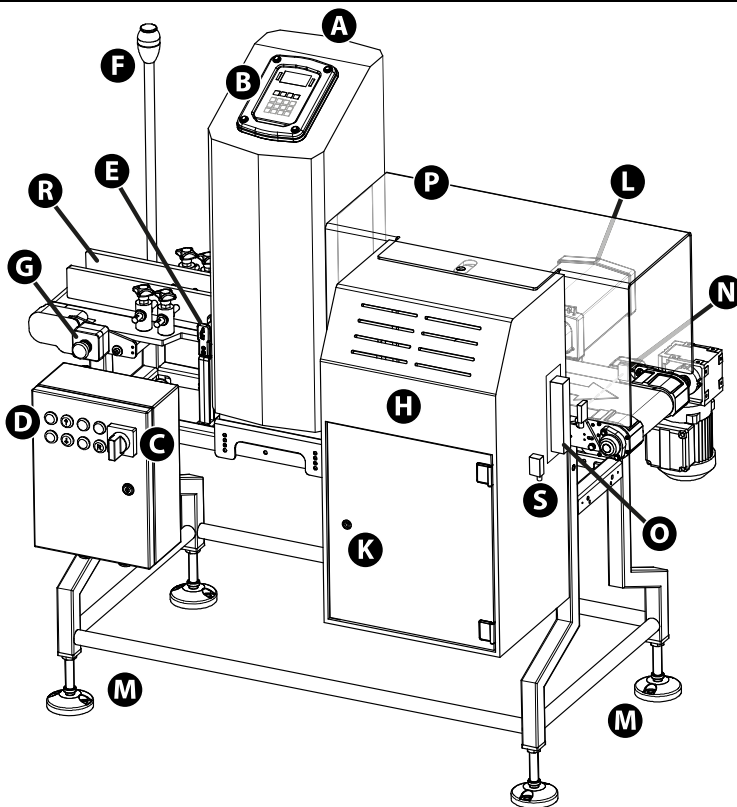
2.3 Integrated systems on the conveyor belt

2.3.1 THS-FBB



A	Detection probe
B	Control and programming panel
C	Main ON-OFF switch
D	Conveyor belt control panel CCS
E	Synchronization photocell ¹
F	Signal light tower
G	Emergency stop pushbutton
H	Rejected product bin
K	Rejected product bin lock (or, upon request, solenoid lock)
L	Ejection system
M	Support feet (to be fixed to the floor) or lockable castors
N	Ejection Verification photocell (optional)
O	Ejection Confirmation photocell
P	Protection cover
R	Product containment banks
S	Bin full sensor (optional)
W	Door with magnetic safety sensor (optional)

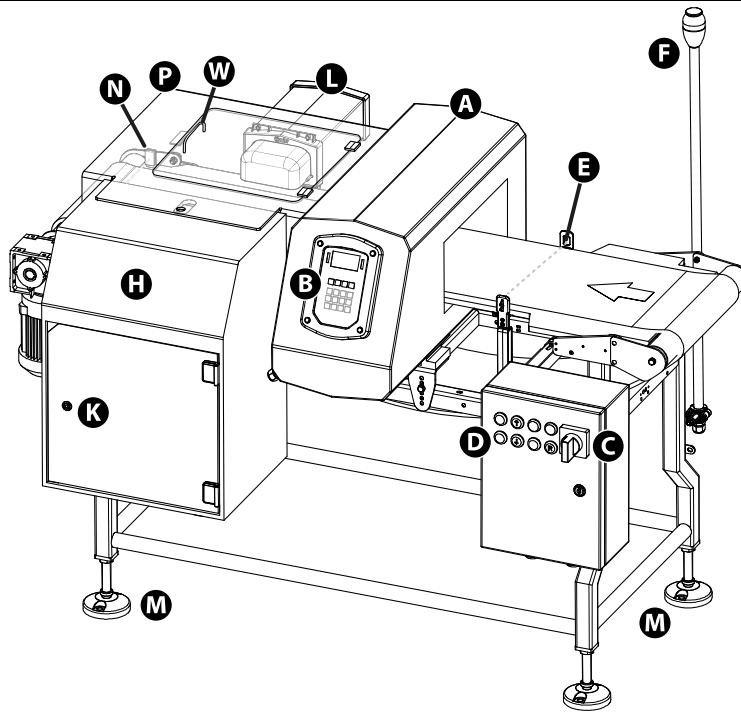
2.3.2 THS-FBBV



¹ In some systems, it can be placed at the exit of the probe, rather than at the input

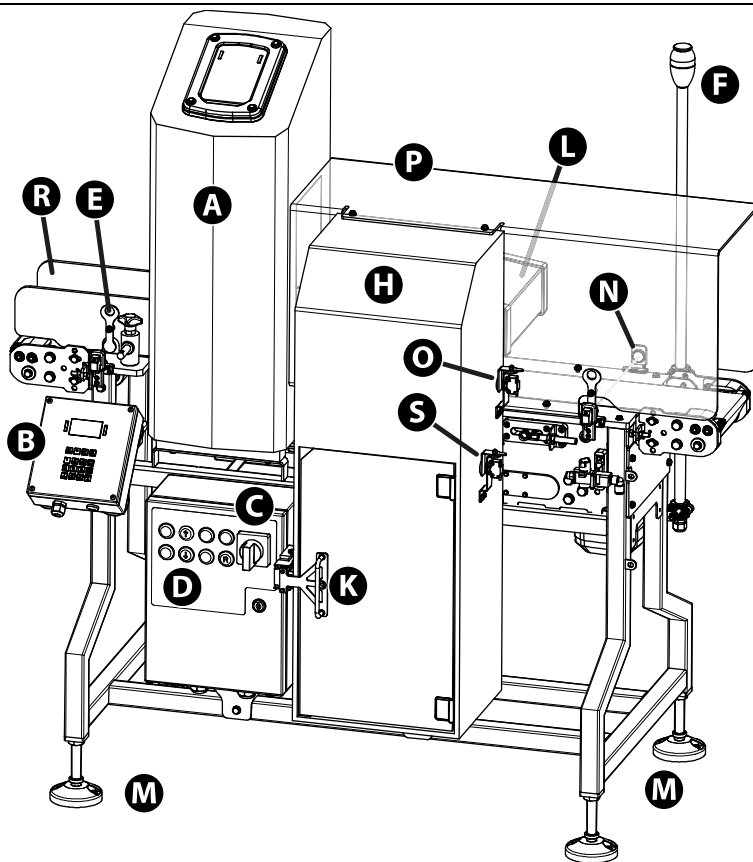
DESCRIPTION

2.3.3 THS-MBB

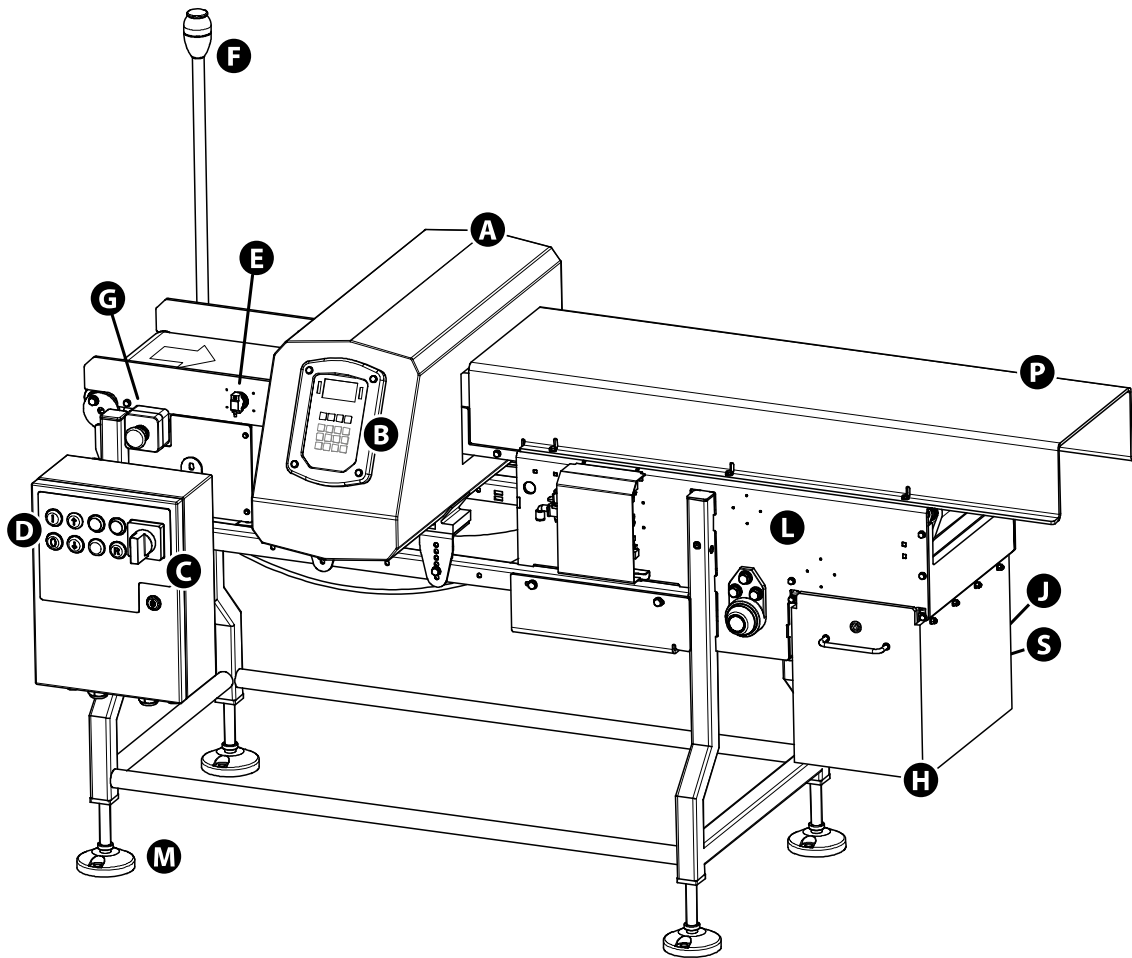


A	Detection probe
B	Control and programming panel
C	Main ON-OFF switch
D	Conveyor belt control panel CCS
E	Synchronization photocell ¹
F	Signal light tower
G	Emergency stop pushbutton
H	Rejected product bin
K	Rejected product bin lock (or, upon request, solenoid lock)
L	Ejection system
M	Support feet (to be fixed to the floor) or lockable castors
N	Ejection Verification photocell (optional)
O	Ejection Confirmation photocell
P	Protection cover
R	Product containment banks
S	Bin full sensor (optional)
W	Door with magnetic safety sensor (optional)

2.3.4 THS-FBV



¹ In some systems, it can be placed at the exit of the probe, rather than at the input

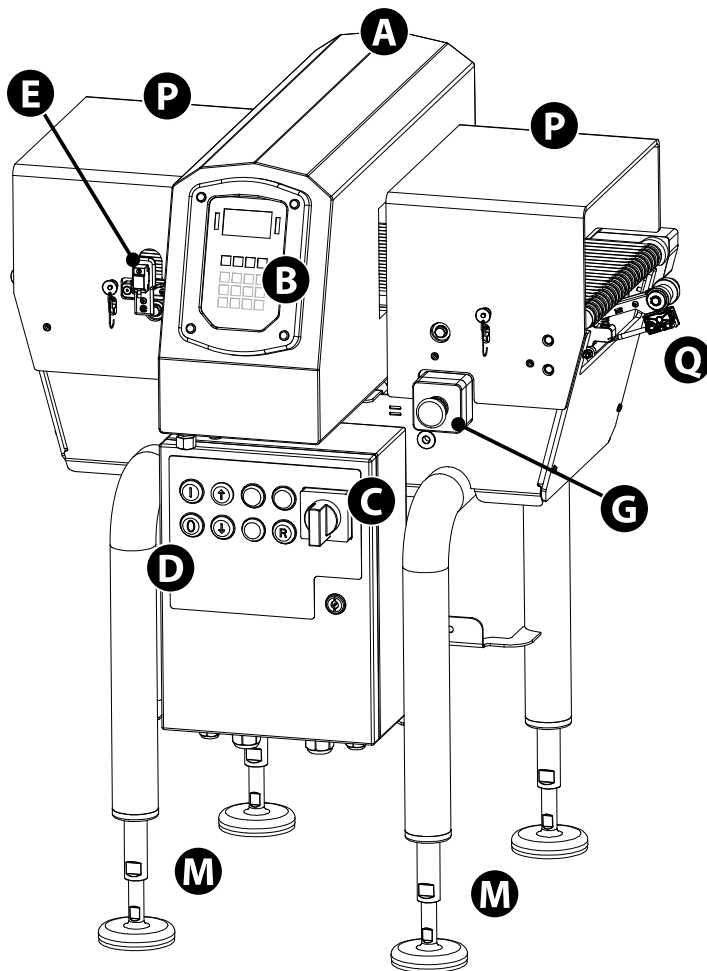
2.3.5 THS/MBR


A	Detection probe
B	Control and programming panel
C	Main ON-OFF switch
D	Conveyor belt control panel CCS
E	Synchronization photocell
F	Signal light tower
G	Emergency stop pushbutton

H	Rejected product bin
J	Magnetic safety sensor
L	Ejection system, fitted with Ejection Confirmation and Ejector Position Check sensors
M	Support feet (to be fixed to the floor) or lockable castors
P	Protection cover
S	Bin full sensor (optional)

DESCRIPTION

2.3.7 THS/RB and THS/RBK

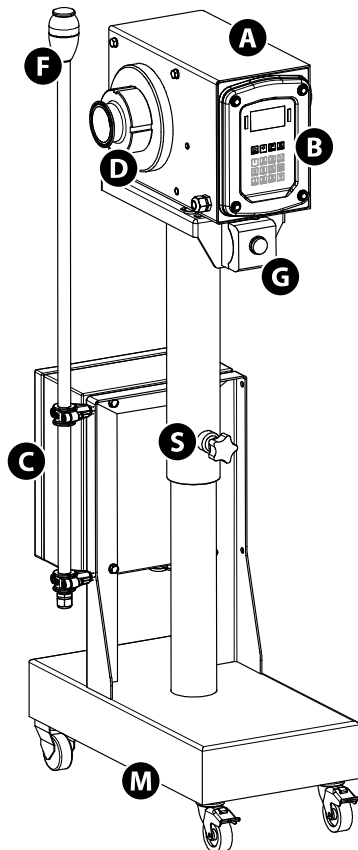
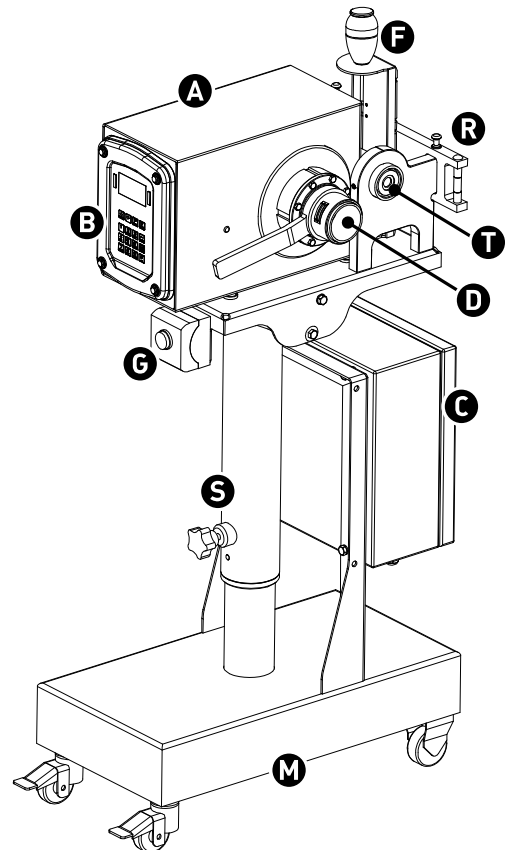


A	Detection probe
B	Control and programming panel
C	Main ON-OFF switch
D	Conveyor belt control panel CCS
E	Synchronization photocell
G	Emergency stop pushbutton
M	Support feet (to be fixed to the floor) or lockable castors
P	Protection cover
Q	Encoder (optional)

2.3.8 THS/CONV



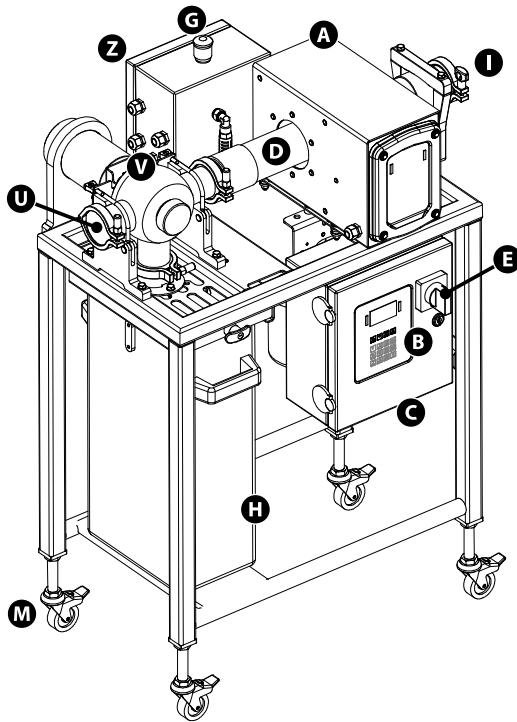
For all custom models, THS/CONV type, please refer to the personalized drawings provided with the System.

2.3.9 THS/PL21E and THS/PLH21

THS/PL21E, THS/PL21

THS/PLH21E, THS/PLH21

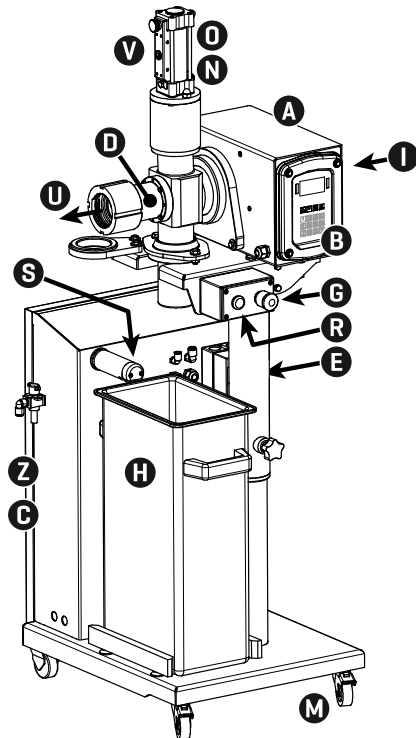
A	Detection probe
B	Control and programming panel
C	Power Supply Box CPB
D	Product conveyor tube
F	Signal light tower (optional)

G	Alarm reset button
M	Base with lockable castors
R	Universal structure for coupling to the machine in the line
S	Stand adjustable in height and orientation
T	Power take-off for transmitting drive to the twisting system

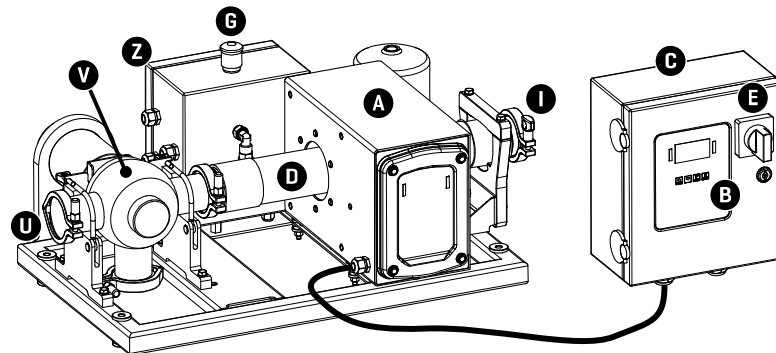
2.3.10 THS/PLV21E, THS/PLV21



THS/PLV21E, THS/PLV21



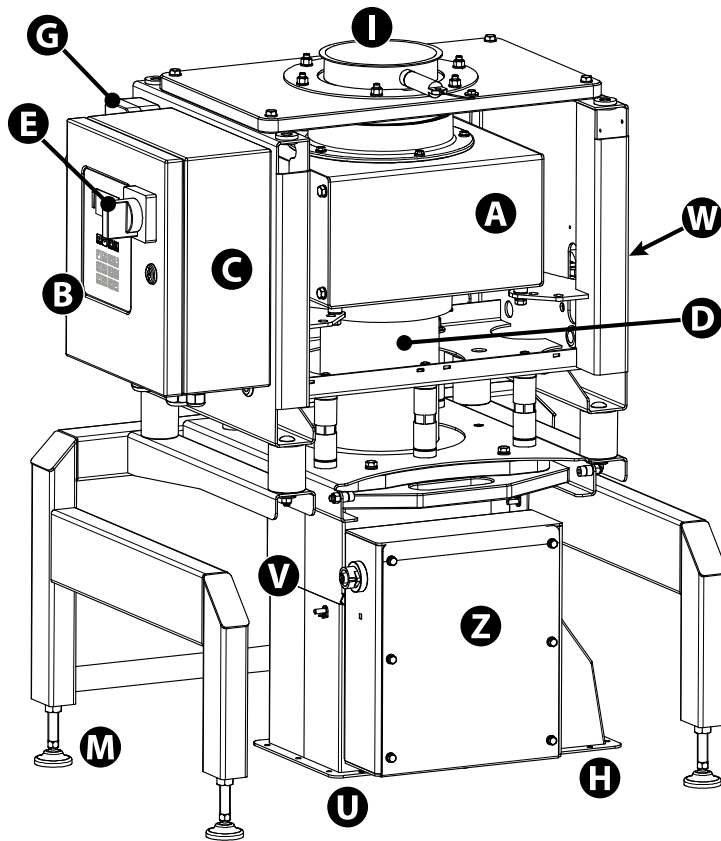
THS/PLVM21E, THS/PLVM21



THS/PLV21E-C, THS/PLV21-C

A	Detection probe
B	Control and programming panel
C	Control Power Box CPB
D	Product conveyor tube
E	Main switch
G	Emergency stop button
H	Rejected product bin
I	Product entrance

M	Adjustable wheels
N	Ejector Position Verification sensor
O	Ejection Confirmation sensor
R	Reset button
S	Bin full sensor
U	Inspected product exit
V	Ejection system
Z	Pneumatic box

2.3.11 THS/FFV21


A	Detection probe
B	Control and programming panel
C	Control Power Box CPB
D	Product conveyor tube
E	Main switch
G	Emergency stop button
H	Rejected product exit
I	Input flange for material to be inspected
M	Adjustable feet
U	Inspected product exit
V	Ejection valve
W	Compressed air group
Z	Ejection valve activation system, with Ejection Confirmation and Ejector Position Check sensors

3 INSTRUCTIONS FOR USE



Before you start to use the equipment, read the provided Warnings Manual.

3.1 Preliminary checks

Power supply unit

Hazardous voltages are present inside the power supply unit. Close and lock the door and keep the key in a place where it is only accessible to trained, authorised personnel. Take precautions to prevent inadvertent startup when the door is open. The switch can be padlocked in the OFF position during maintenance.

Guard covers

Check that all guard covers are correctly fitted and secured in place.

Reject bin

Check that the reject bin is in position and correctly secured.

Equipment fixing

Check that the equipment is correctly installed in a stable manner, in accordance to the Installation Manual. In case the equipment is fitted with castors, check that they are locked.

Obstructions on belt

Before you start the conveyor belt, check that there are no extraneous objects on the belt.

Emergency stop buttons

Check the efficiency of all the emergency stop buttons and safety switches installed on the system. Check the efficiency of any emergency buttons and safety switches connected to the emergency circuit of the production line (see paragraph 3.8.1.3).

Product infeed and outfeeds

Check that the equipment is correctly aligned with the downstream and upstream transport line. In case of pipe transport, check that entrance and exits are correctly connected.

Compressed air On-Off valve

During maintenance switch off and lock out this valve with a padlock.

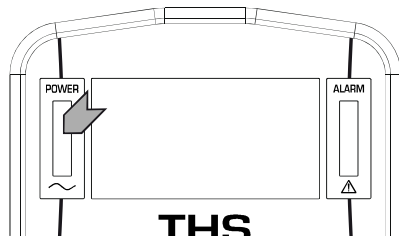
3.2 Switching ON the Metal Detector



Check that all the guards are present and efficient. DO NOT start the system if a safety device is faulty. Do not tamper with or attempt to by-pass safety devices. The manufacturer declines all liability for damage or injuries resulting from tampering with safety devices.

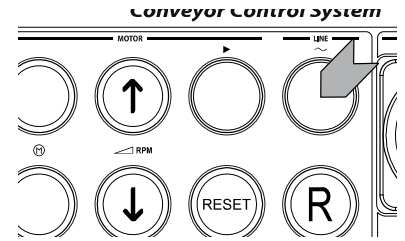
In equipment fitted with a Main ON-OFF switch, rotate the corresponding handle to the ON position. In equipment without it, an external switch must be provided.

3.2.1 Signals when switching on



Control panel

When the power supply is switched ON, the 'Power' warning light on the control panel will light up. A warning light on the door of the Conveyor Control System box will also light up.



Conveyor Control System

When the unit is switched ON, the display and the warning lights on the front panel of the electronic control unit are switched on.

The display shows the following information in sequence: the serial number; the version of the software program that controls the power supply unit.

On CEIA conveyor systems, the display shows the message **EMERGENCY RESET** and waits for you to press the **R** key (Emergency Reset).

After this the following display appears:

THS/xx21E

```
THS/xx21E V5.xxx
Product: PROD01
|
```

The first line identifies the model and the software version of the Metal Detector. The second line indicates the programming type. This is specific to one product and may be selected from the 250 sets stored to memory.

THS/xx21

```
CEIA THS/xx21
ALM V5.xxx THS V5.xxx
Product: PROD01
```

The first line identifies the model. The second line identifies the software version of the Metal Detector. The last line indicates the programming type. This is specific to one product and may be selected from the 500 sets stored to memory.

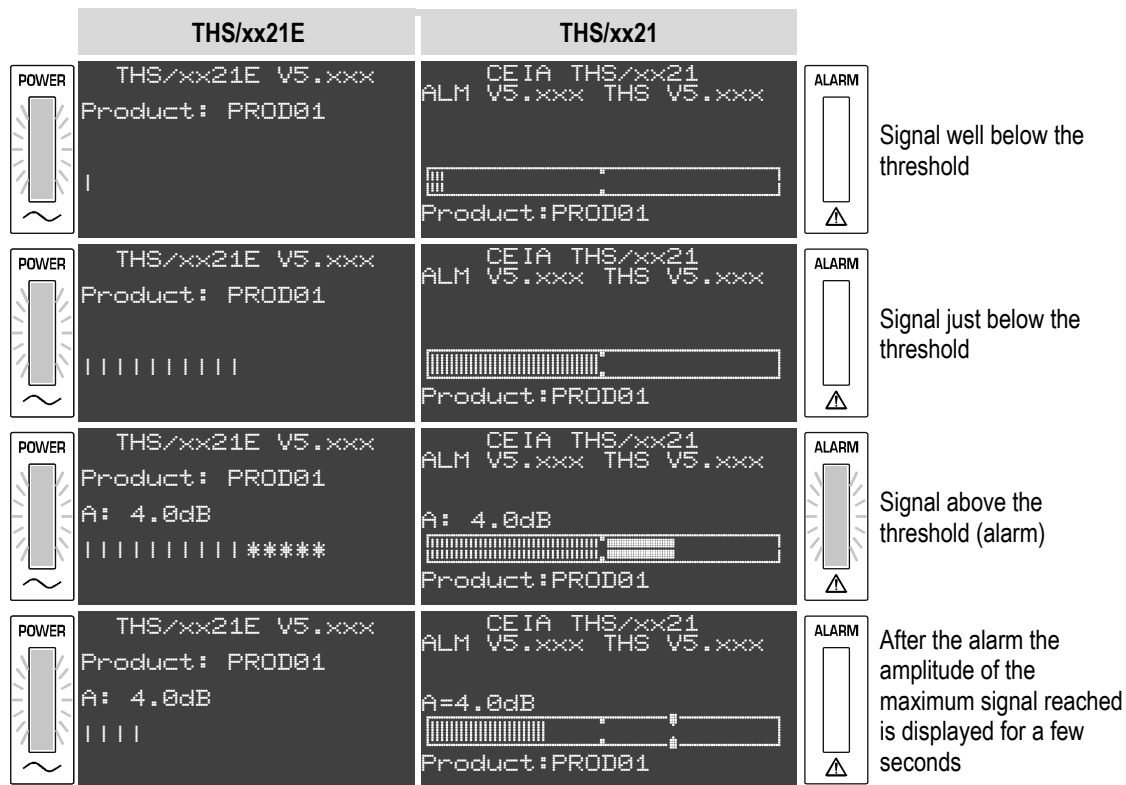


On equipment with additional **RCU** (Remote Control Unit), the main control panel is disabled and the message Remote control ON appears on its display.

3.2.2 Signals supplied during use

3.2.2.1 Received signal indicator

The fourth line of the display shows the received signal in the form of a horizontal light bar divided into segments. As the strength of the signal increases the length of the bar increases towards the right. The alarm threshold is in the center of the display. The segments on the left are vertical bars. The segments on the right are filled out.



The displays shown here are provided as examples only.

3.2.2.2 Display messages

The Metal Detector displays messages showing its operating state:

	THS/xx21E	THS/xx21	
	THS/xx21E V5.xxx Product: PROD01	CEIA THS/xx21 ALM V5.xxx THS V5.xxx Product: PROD01	The Metal Detector is in its normal operating state
	THS/xx21E V5.xxx Product: PROD01 A: 4.0dB *****	CEIA THS/xx21 ALM V5.xxx THS V5.xxx A: 4.0dB Product: PROD01	The Metal Detector is in its normal operating state: it has just detected a metal object and has activated the slave devices
	Password █-----	Password █-----	Programming access prompt: enter a password to access programming
	Reset Products Autolearn Detection	* Reset.....* Products Autolearn Detection Ejection	The Metal Detector is in the programming mode: the accessible parameters may be modified
	TEST Product: PROD01	!! TEST !! Product: PROD01	The Metal Detector requires a functional test (see section 4.8)
	RESET EMERGENCY (press R button)	RESET EMERGENCY (press R button) Product: PROD01	The Metal Detector requires operator intervention
	==== STATUS ==== Sensitivity 265 TX program 0 Band HIGH	==== STATUS ==== Sensitivity 265 Detection mode 4 FE perform. 0.80 NFE perform. 1.00 SS perform. 1.20 Prd.alarms 10 — # Scroll down —	Press the STATUS key in the normal operating display to list information about the equipment states.

Use the arrow keys to scroll through the list. Press the P key to return to the normal operating display. The Status display shows general information about the system (i.e. date and time, serial number, firmware versions installed, etc.) and information about the actual configuration (i.e. sensitivity, detection mode or band, counter status, time for the next test, etc.). On 21 series models, the CEIA test samples, are also indicated, estimated on the current configuration.



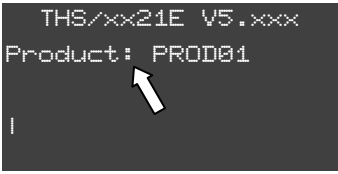
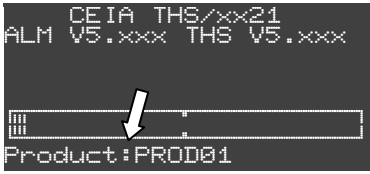
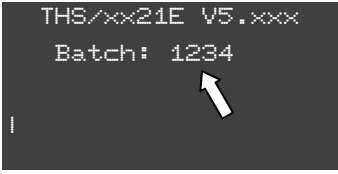
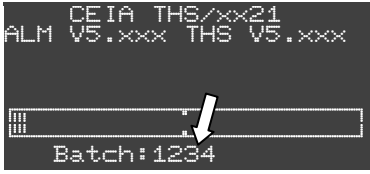
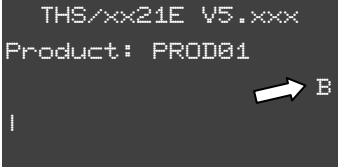
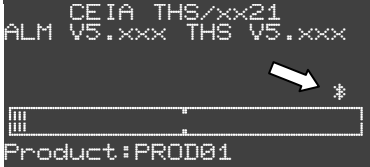
The displays shown here are provided as examples only.

3.2.3 Self-diagnostic messages

The THS Metal Detector has an integrated self-diagnostic system. The messages shown on the display are described in section 4.3.3.

3.2.4 Other messages and signals

The Metal Detector displays other information about its operating state:

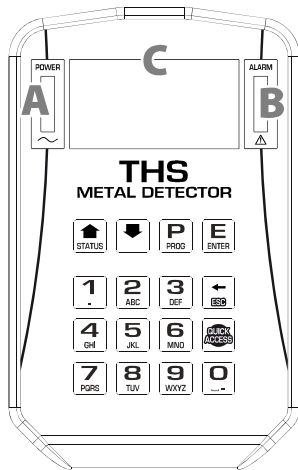
THS/xx21E	THS/xx21	
		<p>The colon alongside the product selected flashes to indicate that the Metal Detector is operating.</p>
		<p>If the system is set to also include the batch number, the batch name is displayed instead of the name of the product selected.</p>
		<p>If the system is correctly connected via Bluetooth, the related symbol is shown on the right side of the display. The symbol flashes to indicate that a data transfer is in progress.</p>

3.3 Indicators

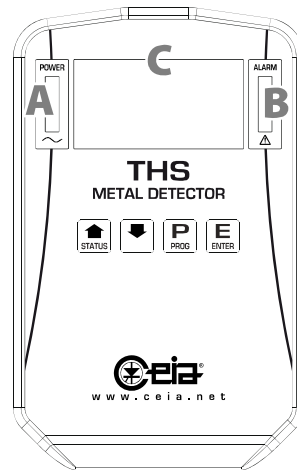
3.3.1 Warning lights and displays

3.3.1.1 Control panel

The control panel with the warning lights and controls for the Metal Detector is located on the detection probe or on the power supply box (on systems fitted with the RCU remote control unit):



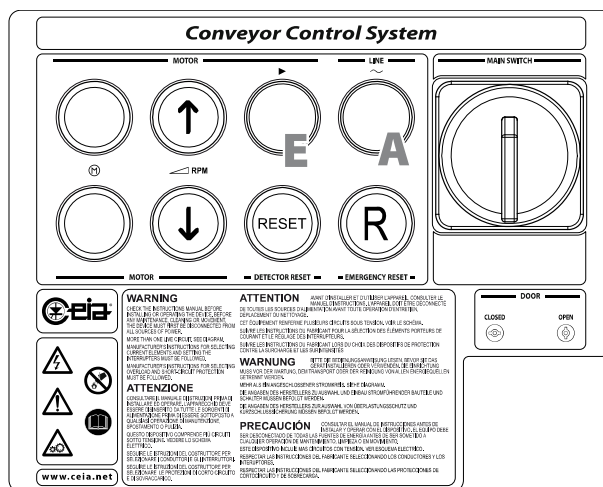
Control panel
THS/21



Control panel
THS/21E

A	POWER	Green warning light, lights up to indicate Power On.
B	ALARM	Red warning light, lights up to indicate that a metal fragment has been detected or that a fault is present.
C	Display	This displays operating, programming and self-diagnostic messages.

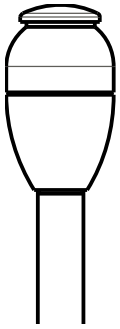
3.3.1.2 Conveyor Control System



A	LINE	WHITE warning light, lights up to indicate Power On.
E	Motor running	STEADY GREEN LIGHT Indicate that the transport is moving FLASHING GREEN LIGHT indicate that the transport is stopped and waiting for a consent signal by other in-line equipment

Signal light tower

The external beacon has coloured lights to indicate the following statuses:

RED	Fault present	
AMBER	Detection alarm present	
BLUE	Test request	
Buzzer	External horn	

Light	Meaning	Light state	
a	RED	No fault/alarm present	Off
		Emergency or fault message to be reset	Slow flashing
		Emergency present	Fast flashing
b	ORANGE	No alarm present	Off
		Detection alarm present ¹	On
		Waiting for manual alarm reset ²	Slow flashing
c	BLUE	No test request present	Off
		Test required	Slow flashing

¹ Programmable. See the Programming Manual

² In the ejection modes with the belt stopped

3.3.2 Buzzers

The Control Power Box and the Conveyor Control System each have an internal buzzer which sounds to indicate the presence of a fault or an alarm condition (i.e. metal has been detected).

The external buzzer only sounds when a fault is present. It can be programmed to sound in the presence of an alarm. For programming instructions, see the Programming Manual.

3.4 Controls

3.4.1 Control panel

The device parameters are controlled and programmed using the control panel keypad, as described below:

THS/xx21E and THS/xx21

Key	Function
	To enter and leave the programming mode
	To move from a programming submenu to the previous menu
	To cancel the last character entered
	To leave the Metal Detector status display
	To select the programming menu To select the parameters to be modified
	To display the Metal Detector status
	To select sub-menu items
	To confirm the programming value entered
	To reset alarms and some types of fault ¹ To reset Emergency on models THS/FFV and THS/PLV







¹ Programmable. See the Programming Manual

Only on THS/xx21

Key	Function
	To cancel the last character entered
	To skip straight to pre-set functions
 	To modify parameter values

3.4.2 Conveyor Control System control panel

The enclosure door of the Conveyor Control System power supply unit has a built-in motor control panel.

Key	Function
	GREEN button: Start the conveyor belt
	RED button: Stop the conveyor belt
	Increase belt speed Programmable ¹ : - No function - Manual forward travel
	Decrease belt speed Programmable ¹ : - No function - Manual reverse travel
	Metal Detector alarm reset Can be disabled ¹
	Emergency reset

¹ Refer to the Programming Manual



The manual forward/reverse controls are only enabled when the belt is stopped.

The increase/decrease speed controls are enabled both when the belt is stopped and the belt is running, but disabled during programming operations.

3.5 Basic functions

For information about all programming operations, modifications to installation parameters, local and remote control, see the **Programming Manual**.

3.5.1 Using the Quick Access key



Only on 21 series models.

The system administrator can program up to 10 functions which can then be called up rapidly by pressing the Quick Access key and the corresponding numeric key.



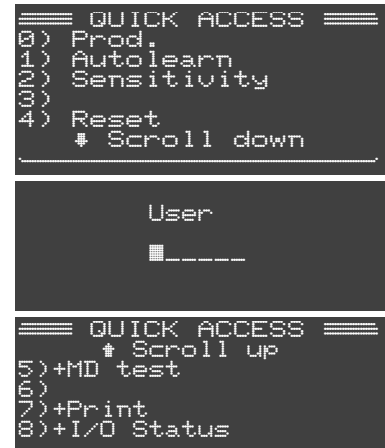
Press the **Quick Access** key.

The display will list the first five functions programmed by the system administrator.

Press the **2** key to access, for example, the **Sensitivity** modification function. If the function is password-protected, the THS will display a prompt asking you to enter a user name and password.

To display the other five programmed functions, for the keys from 5 to 9, use the arrow keys to scroll through the list.


The + sign alongside a function indicates a link to the corresponding menu.



The list of **Quick Access** functions shown above is provided as an example only. The list can be programmed by the system administrator and is supplied as standard ready for customization.

For the programming of the list of functions accessible using the Quick Access button, see the Programming Manual.

3.5.2 Access to programming

To enter the Programming mode press the  key.

3.5.3 Entering your user name

Depending on the settings made by the system administrator, the Metal Detector may display a prompt asking you to enter a user name and password. Each type of operator only has access to a specific set of parameters and related menus.

If required, compose the user name using the Control Panel keypad, as indicated below.




In the following examples, a non-existent user name is used, with the sole purpose of explaining its insertion. Contact your Administrator for your assigned username and password.


3.5.3.1 THS/xx21E

The cursor flashes over the position of the first character. The arrow keys allow to scroll the character list, up and down, until the desired character is shown.

```
User
  █_____
```


To insert an “F”, for example, press the  key sixteen times to scroll the alphabet from “0” to “9” and from “A” to “F” to set “F” as the first character.

```
User
  F█_____
```

Press  to confirm and to pass to the next character.

For the next characters, the list will start from the last inserted character, in order to ease the insertion. Repeat the sequence until the whole user name is typed.

```
User
  FF█_____
```

By confirming the last character with  the user name is typed and the password is next (if needed).


```
User
  FRANCK
```

3.5.3.2 THS/xx21


The cursor flashes over the position of the first character. The alphanumeric keypad allow to easily insert the characters, according to the sequence printed on the key itself.

```
User
  █_____
```

To insert a number, press once the corresponding key.


Pressing the  key only once, will type the number “3”.

```
User
  3█_____
```

In order to insert the “F” letter, the  key shall be pressed 4 times.

The cursor automatically switches to the next position when it detects a pause in the key sequence. Repeat the sequence until the whole user name is typed.

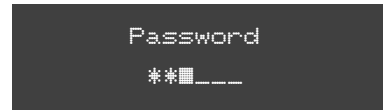
```
User
  FRANCK
```

Confirm the user name by pressing  after the last character.

```
User
  FRANCK
```

3.5.4 Entering the password

According to the Administrator settings, it is possible that the system will require a password. In this case use the same insertion system used for the user name.



The display will show each character entered as an asterisk.

3.5.4.1 Restricted login

This fault message appears if three consecutive attempts to access with the wrong password or user name have been made.



Due to this event, the detector is NOT operative and set itself on fault status.


To reset the system, access to programming by any enabled user, is sufficient.


Only an Administrator (ADMINI or any other user allowed to use the **Administrator** menu) can set a new temporary password for the User causing the fault.


3.5.4.2 Change the access password



If no password has been assigned by the system administrator, it is not possible to change the password.

Enter the Programming mode. With the cursor positioned on the first line of any menu, press the  key for at least 5 seconds.

The screenshot shown here will appear. Press  again to confirm.

Enter the new password and confirm with .

THS/xx21E	THS/xx21
Product PROD01*	Product.....PROD01→
=====	=====
Do you want to change password? U =YES-----NO= E	Do you want to change password? — ↑=YES — NO=E —
=== New password ===	=== New password ===
_____	_____
-----	-----

3.5.5 Selecting a product

To select a product from the list of products programmed and set by the system administrator or the supervisor, proceed as follows:

Access the programming mode as an operator by pressing . Where requested, enter a user name and password. Select the **Product selection** menu.

Select the **Product** option to start the selection of a new product.

Press . The display will show a list of all stored products in alphabetical order.

Use the arrow keys to scroll backwards and forwards through the list of products available.

Press to confirm the new product selected.

To make searching the list for a product easier, type in the first few characters of the product name. The system will now limit the list to the products whose names begin with the letters you typed in.

THS/xx21E	THS/xx21
Product selection *	Product...selection.....*
Product DEFAULT*	Product.....DEFAULT*
==== Product ==== *DEFAULT PROD01 PROD02	==== Product ==== *DEFAULT PROD01 PROD02 POW003 SUGAR Search: █_____
==== Product ==== DEFAULT PROD01 *PROD02	==== Product ==== DEFAULT PROD01 *PROD02 POW003 SUGAR Search: █_____
Product PROD02*	Product.....PROD02*
not available	==== Product ==== PROD01 *PROD02 Search: PR█_____

3.6 Programming the Metal Detector for a particular product type

See section 2.8 of the Programming Manual.

3.7 Using the equipment

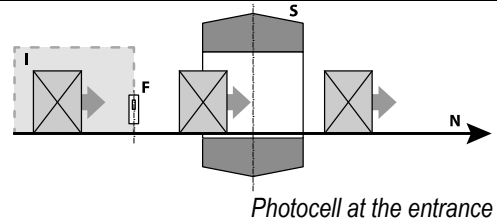
3.7.1 Normal use



Before starting the product transport, check that the Metal Detector is in operative conditions and the selected settings are correct for the current product.

3.7.1.1 Loading the product to be inspected

The product to be inspected shall be loaded before the detection probe (with respect to the transport direction) and, if present, also before the synchronization photocell.



*N: Conveyor belt and transport direction;
S: Detection probe; F: Synchronization photocell;
I: Correct area where the product shall be loaded*

3.7.1.2 Starting and stopping the transport



In case the transport system need to be restarted after a power shutdown, **remove and inspect again** any product left between the detection probe and the stop line.

On Systems with **CCS**, with power supply on and motor stopped, check that the warning lights are ON or OFF as shown in the following table:

Warning light		State
~	Power supply	ON
▶	Motor running	OFF

- To start the motor, press the GREEN **Start** button. Check that the motor starts and that the green ▶ warning light (Motor On) lights up.



If the green ▶ indicator is flashing, and the transport does not start, first start the system that gives the consent signal to the transport itself. In this case, the transport will start automatically.

- To stop the motor, press the RED **Stop** button. Check that the motor stops and that the ▶ warning light switches off.

In Systems synchronized by means of an active transport signal, verify that the message **Transport stopped** is displayed before starting the transport, and that this is no longer displayed during the transport phases of the product.







Where necessary it is possible to stop the conveyor belt immediately by operating the main ON-OFF switch.

3.7.1.3 Adjusting the conveyor belt speed

The speed of the conveyor belt can be adjusted by:

- Programming the **Speed** parameter on the Metal Detector (if enabled for the Operator).
- Operating the keys on the Conveyor Control System (if not disabled).



During programming of the Metal Detector, the speed adjustment function using  and  is disabled. When  and  are being used, the Metal Detector programming function is disabled.

```

Minimum speed      20
Speed.....40+
Maximum speed      60
  
```



The **Speed** parameter reading indicates the speed set. Any speed change is stored in memory as a parameter specific to the current Product and is kept in memory even after a system shutdown.



Speed changes by arrow keys are kept in memory after a system shutdown.

3.7.1.4 Checking safety devices

Check the efficiency of each emergency stop button on the system as follows:

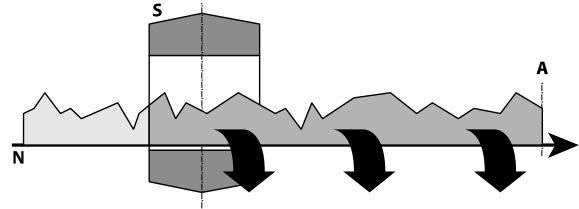
1. Start the transport system. Press the emergency stop pushbutton. Check that:
 - all moving parts of the System will be immediately stopped and de-energized (conveyor belt stopped and/or ejection system deactivated);
 - the warning lights light up and that the buzzer sounds;
 - adequate actions are guaranteed on the emergency circuit of the line eventually connected to the system.
2. Release the emergency stop button. Reset the system by pressing the  button, on conveyor belt Integrated Systems, or the  key on the other Integrated Systems.
3. If other safety sensors are present (i.e. on the reject bin or an inspection door), repeat step 1 by activating each sensor (i.e. by opening the inspection door or removing the bin) and step 2 by resetting the safety conditions (i.e. by closing back the inspection door or re-positioning the bin).

If the THS system is connected to the emergency circuit of the production line, you should also check the efficiency of any external emergency stop buttons connected to the System.

3.7.2 Alarm reset

In case of an alarm due to metallic contamination, the contaminated product is ejected from the integrated system according to the ejection mode which has been selected:

- Automatic ejection of the contaminated material. The transport is not stopped and the contaminated product is sent into a reject bin which should be emptied at regular intervals by the operator. In this case, the detector resets automatically.
- Transport stopped mode.
The transport system is stopped and the contaminated product is positioned in the planned area for manual removal by the operator.



After a stop due to a metal alarm, all material between the detection probe (S) entrance and the stop line (A) must be removed.

A manual reset and restart of the belt is required. To reset an alarm manually:

- press the key on the front panel (where enabled)
- press an external button connected to the RESET input (as on THS/PLVM21)
- enter the programming mode and select the `Reset` command
- press the **Detector Reset** button (only on **CCS**) or, in case it was replaced by a lock, activate the related key



In case the transport system need to be restarted after a power shutdown, **remove and inspect again** any product left between the detection probe and the stop line.

3.7.3 Fault reset

For faults which require a manual reset, trace and remove the cause of the fault, then, according to what's available to the operator:

- press the key on the front panel (where enabled)
- enter the programming mode and select the `Reset` command
- press the **Detector Reset** button (only on **CCS**) or, in case it was replaced by a lock, activate the related key
- press the external Reset button connected to the RESET input (as on THS/PLVM21)



On THS/PLVM21, the external Reset button is blinking in yellow when Reset is required.

3.7.4 Emergency reset

In case one of the system Emergency buttons has been pressed, or one of the protections with safety sensor has been opened, in order to restart the production line:

- on Integrated Systems unlock the Emergency button previously pressed or close the protection previously opened;
- on **CPB**, press the key on the front panel;
- on **CCS**, press the Emergency reset button;

3.7.5 Removing and emptying the reject bin

The reject bin, where fitted, must be emptied at regular intervals.



During this operation exercise extreme caution. The reject material bin could be heavy. You must have procedures specific to this operation. You must implement these procedures. The manufacturer declines all liability for injury to persons or damage to property caused by emptying the bin in an incorrect manner.



The bin has a maximum load bearing capacity shown on a label in a clearly visible position on the bin. The operator is responsible for emptying the bin at regular intervals before this weight is exceeded.



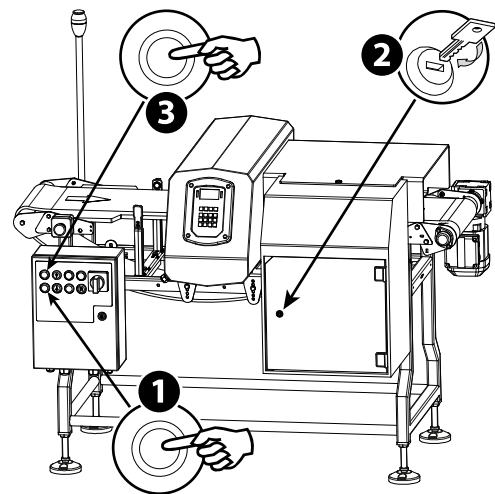
Example of label



If the reject bin is fitted with an electric lock, you need to unlock it using the **Unlock bin** command in Programming. You must then remove the bin within the preset maximum time and empty it. At the end of the operation, slide the reject bin back on its guides until the electric lock locks.

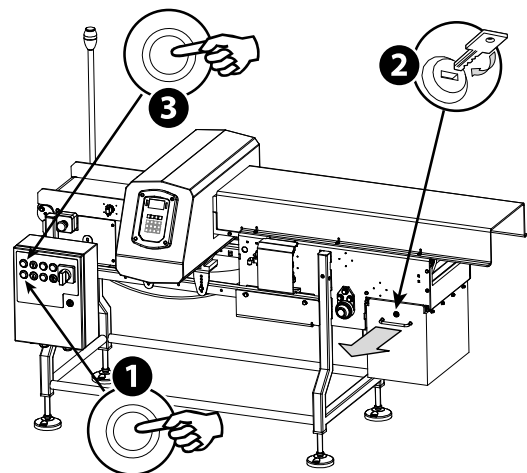
3.7.5.1 THS/FB, THS/FBB and THS/MBB

- ❶ Press the RED Belt Stop button, if the belt is moving;
- ❷ Using the key provided, open the door of the reject bin. Empty the bin. Close the door again correctly.
- ❸ Press the GREEN Belt Start button to restart the transport.



3.7.5.2 THS/MBR

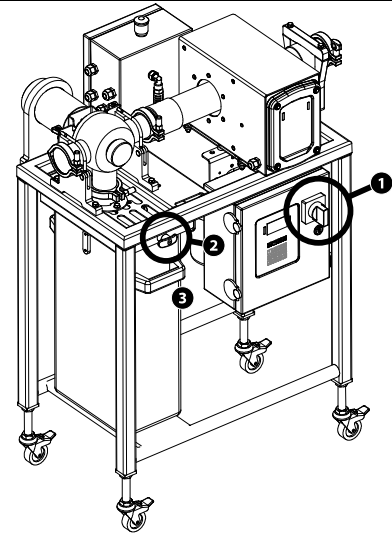
- ❶ Press the RED Belt Stop button, if the belt is moving;
- ❷ Using the key provided, unlock the reject bin to release it. Remove the bin from its seat and empty it. At the end of the operation, place the bin in the guides and lock it again, with its key.
- ❸ Press the GREEN Belt Start button to restart the transport.



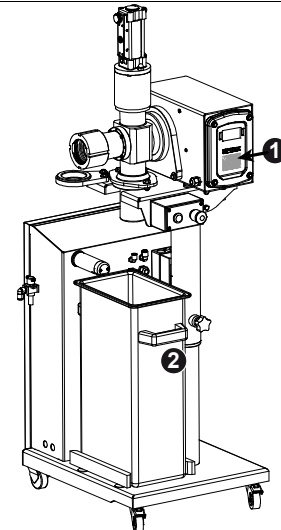
If the "Emergency activation if no bin present" option is installed, when the reject bin is removed the machine will switch to an emergency condition. When you have refitted the bin, reset the system by pressing the Emergency Reset button R.

3.7.5.3 THS/PLV21x

- Stop the product transit.
- ❶ Turn off the system by means of the main switch.
- ❷ Unlock the rejected product bin by means of its own key.
- ❸ Extract and empty the rejected product bin.
- Insert back correctly the rejected product bin.
- Lock it back by means of its key.
- Check that all the safety devices are properly installed and in place and that there are no other dangers, then turn on the system again, through the main switch.


3.7.5.4 THS/PLVM21x

- Stop the product transit
- ❶ If the electric lock option is present, unlock it following the correct procedure (refers to the Programming manual)
- ❷ Extract and empty the rejected product bin, staying away from the valve.
- Insert back correctly the rejected product bin.
- Check that all the safety devices are properly installed and in place and that there are no other dangers.



3.7.6 Automatic stop



This function is only available on **CCS**.

The conveyor belt will stop automatically in the following cases:

Self-diagnostic status

If a self-diagnostic message is present, the conveyor belt is programmed to be automatically stopped.



It is possible to disable this function. However, the READY relay is deactivated.

Automatic stop through an enabling signal from an external machine

Deactivating the FOLLOWING CONVEYOR input from an external machine connected to the conveyor belt will stop the conveyor belt immediately.

Automatic stop due to absence of product in transit

On systems fitted with a synchronizing photocell, it is possible to set the conveyor belt to stop automatically if nothing passes through the Metal Detector for a programmed length of time.

3.8 Testing the Metal Detector with reference samples

It is important to check the efficiency of the Metal Detector at regular intervals. This is done by running a detection and ejection test using test reference samples.

- Customers can use their own reference samples based on product characteristics or internal quality control procedures or can request specific sample from CEIA.
- The tests can be performed at programmed scheduled intervals or whenever required (e.g. at each shift changeover). The Metal Detector will automatically request testing at the programmed intervals.

The Metal Detector has a proper function (menu `MD Test`) in order to perform this check and to record the results on the Events Memory.



The customer is responsible for defining the users authorized for this operation (default user 000004).

3.8.1 Performing tests in standard mode

Enter the Programming mode, go to the `MD Test` menu and perform the test as described below.



If the test interval has been programmed, start the test when the prompt message requesting a test is displayed. On units with a signal light tower, the blue light will light up at the same time (BLUE LAMP output).



If a scheduled test is started after the maximum permitted time, the **TEST TIME OUT** message is displayed and, depending on the Metal Detector configuration, a manual reset of the diagnostic status may be required before starting the test.



If scheduled tests have been programmed, the time of the next test scheduled will be displayed in the Status window.

3.8.1.1 Test procedure

The procedure below describes a test with a ferrous metal sample. Follow the same procedure for the other two samples made from non-ferrous metal and stainless steel.

For Tests with two or three samples, the samples will be requested one after the other, without the need to manually select them.

The test cycle and the final test result will be saved to memory, as **FE test**, **NFE test** and **SS test**.

To perform the Metal Detector test (independently or in response to the automatic request), select **MD Test > FE test** and press the **E** key.

THS/21E	THS/21
FE test -0.80 NFE test -1.00 SS test -1.20	FE test -0.80 NFE test -1.00 SS test -1.20



The customer is responsible for ensuring that the test samples are undamaged, clean, used correctly and are suitable for the current product. The customer is responsible for following its own QA procedures.



The test samples must be passed through the unit under normal operating conditions and in compliance with QA procedures.

Wait a few seconds before passing the sample through the unit.

=====	=====
WAIT	WAIT
=====	=====

Pass the test sample requested together with the pure product, through the detection probe within one minute of the request (3 minute with Ejection Mode S or SB).

=====	=====
PASS FE SAMPLE	PASS FE SAMPLE
=====	=====

If the sample is correctly detected and the ejection system correctly activated, the test is successful.

=====	=====
TEST PASSED	TEST PASSED
=====	=====

Press any key to return to the **MD Test** menu where the positive (OK) test result will be displayed.

FE test -0.80 NFE test -1.00 SS test -1.20	FE test -0.80OK* NFE test -1.00 SS test -1.20
--	---



The test is successful if all the test samples are detected (with an amplitude not higher than 12dB, according to the predefined value set) and if the ejector has been correctly activated (i.e. the ejection confirmation sensor has been triggered).

The operator is responsible for checking that the test sample is correctly removed from the reject bin.



In Systems with duct transport, the passage of the sample(s) can be carried out through the proper space available in the duct flange.

If the **test is unsuccessful**, one of the following messages will appear:

Test failed for sample not detected

If the sample is not detected it could be that the sample was not passed through the unit in the one minute immediately after the request, or that the sample signal is lower than the alarm threshold.

Press any key to return to the **MD Test** menu where the negative test result will be displayed.

THS/21E	THS/21
<pre> ===== TEST FE FAILED NO SAMPLE DETECTED ----- </pre>	<pre> ===== TEST FE FAILED NO SAMPLE DETECTED ===== </pre>
<pre> FE Test -0.80 NO(1)+ NFE test-1.00 SS test -1.20 1- NO SAMPLE DETECTED </pre>	<pre> FE...test...-0.80.....NO(1)+ NFE test-1.00 SS test -1.20 1- NO SAMPLE DETECTED </pre>

Test failed for sample too large

The signal from the sample is too high to perform a valid test; the signal is much higher than the maximum permitted level.

Press any key to return to the **MD Test** menu where the negative test result together with its cause will be displayed.

THS/21E	THS/21
<pre> ===== TEST FE FAILED SAMPLE TOO BIG ----- </pre>	<pre> ===== TEST FE FAILED SAMPLE TOO BIG ===== </pre>
<pre> FE Test -0.80 NO(2)+ NFE test-1.00 SS test -1.20 2- SAMPLE TOO BIG </pre>	<pre> FE...test...-0.80.....NO(2)+ NFE test-1.00 SS test -1.20 2- SAMPLE TOO BIG </pre>

Test failed for ejection not confirmed

The test fails if the sample is detected correctly but there is no confirmation of the ejection.

Press any key to return to the **MD Test** menu where the negative test result together with its cause will be displayed.

THS/21E	THS/21
<pre> ===== TEST FE FAILED NO EJECT.CONFIRM ----- </pre>	<pre> ===== TEST FE FAILED NO EJECT.CONFIRM ===== </pre>
<pre> FE test -0.80 NO(3)+ NFE test-1.00 SS test -1.20 3- NO EJECT.CONFIRM </pre>	<pre> FE...test...-0.80.....NO(3)+ NFE test-1.00 SS test -1.20 3- NO EJECT.CONFIRM </pre>

Test failed for ejection timeout

If the ejection cycle is not completed following an alarm within a minute of starting the test, the test is considered to be unsuccessful.

Press any key to return to the **MD Test** menu where the negative test result together with its cause will be displayed.

THS/21E	THS/21
<pre>===== TEST FE FAILED EJECTION TIMEOUT =====</pre>	<pre>===== TEST FE FAILED EJECTION TIMEOUT =====</pre>
<pre>FE test -0.80 NO(3)+ NFE test -1.00 SS test -1.20 3- EJECTION TIMEOUT</pre>	<pre>FE test -0.80.....NO(3)+ NFE test -1.00 SS test -1.20 3- EJECTION TIMEOUT</pre>

Test failed for synchronization photocell error

In the FS ejection mode, if the synchronization photocell is not activated following an alarm during the test, the test is considered to be unsuccessful.

Press any key to return to the **MD Test** menu where the negative test result together with its cause will be displayed.

THS/21E	THS/21
<pre>===== TEST FE FAILED SYNC PHOTOC.ERROR =====</pre>	<pre>===== TEST FE FAILED SYNC PHOTOC.ERROR =====</pre>
<pre>FE test -0.80 NO(3)+ NFE test -1.00 SS test -1.20 3- SYNC PHOTOC.ERROR</pre>	<pre>FE test -0.80.....NO(3)+ NFE test -1.00 SS test -1.20 3- SYNC PHOTOC.ERROR</pre>

Test interrupted

If the self-diagnostic system detects a fault of any kind, the test procedure will be interrupted and the message shown here will be displayed. In this case, the

REMOVE FAULT
CONDITIONS

message warns that the test cannot be repeated without first resetting the system.

The test can also be interrupted by pressing P during the test.

THS/21E	THS/21
<pre>===== TEST ABORTED =====</pre>	<pre>FE test -0.80.....NO(1)+ NFE test -1.00 TEST ABORTED</pre>



In the event of an unsuccessful test, the “TEST FAILED” message is displayed and, if previously programmed, the fault condition is activated. In this case you must perform a system reset before restarting the test..

3.8.2 Performing a Quick test

It is possible to run a test without having to enter the Programming mode. To do this, enable the IN_AUX1 input through an external pushbutton connected to it.

When you activate the input, the display will show a message requesting the test. Run the test by passing the requested samples through the unit in the manual mode.

The result of the test will be recorded in the event log as a *Quick Test*.

4 MAINTENANCE



Before you start any maintenance operations, read the section Safety instructions - Precautions in this manual.



You should wherever possible try to avoid maintenance or repair operations with the unit open and powered up. If this is not possible, operations under these conditions must only be performed authorised, skilled personnel who are fully aware of the hazards involved. Personnel must follow the instructions given in the “Maintenance” section.



When you switch off the main ON-OFF switch of the Conveyor Control System the power supply section will be shutdown. However, you should be aware that some contacts connected to the network (e.g. relay outputs) may remain powered up.

4.1 Scheduled maintenance

The following is a list of maintenance operations and the recommended intervals.

Operation	Interval	Operator	Procedure
Preventive maintenance	At the start of every work shift	Operator	Visual inspection of component condition. Check of safety components - Section 3.1
	At product type changeovers		
	At regular intervals		
Empty the reject bin	At regular intervals	Operator	Section 3.8.5
Detection test	At the start of every work shift	Quality operator Quality manager	Section 3.9
	At product type changeovers		
	At regular intervals		
Check the bearings (only on conveyor belts)	At regular intervals	Operator	Visual inspection of bearings for efficiency and lubricant leaks.
Cleaning	At the start of every work shift	Operator	Section 4.2.1
	At product type changeovers		
	At regular intervals		
Clean the conveyor belt (only on conveyor belts)	As required	Operator	Section 4.2.2
Empty the compressed air filter container	As required	Operator	



Check the condition and efficiency of the system. If necessary, contact the Maintenance Service for advice.

4.2 Regular maintenance procedure

4.2.1 Cleaning parts NOT in contact with the product

Metallic parts

Only use products compatible with stainless steel.



DO NOT use HYDROCHLORIC ACID or its solutions

Plastic parts

Use a non-abrasive cloth dampened with water, especially on the probe inside.



DO NOT use other cleaning procedures



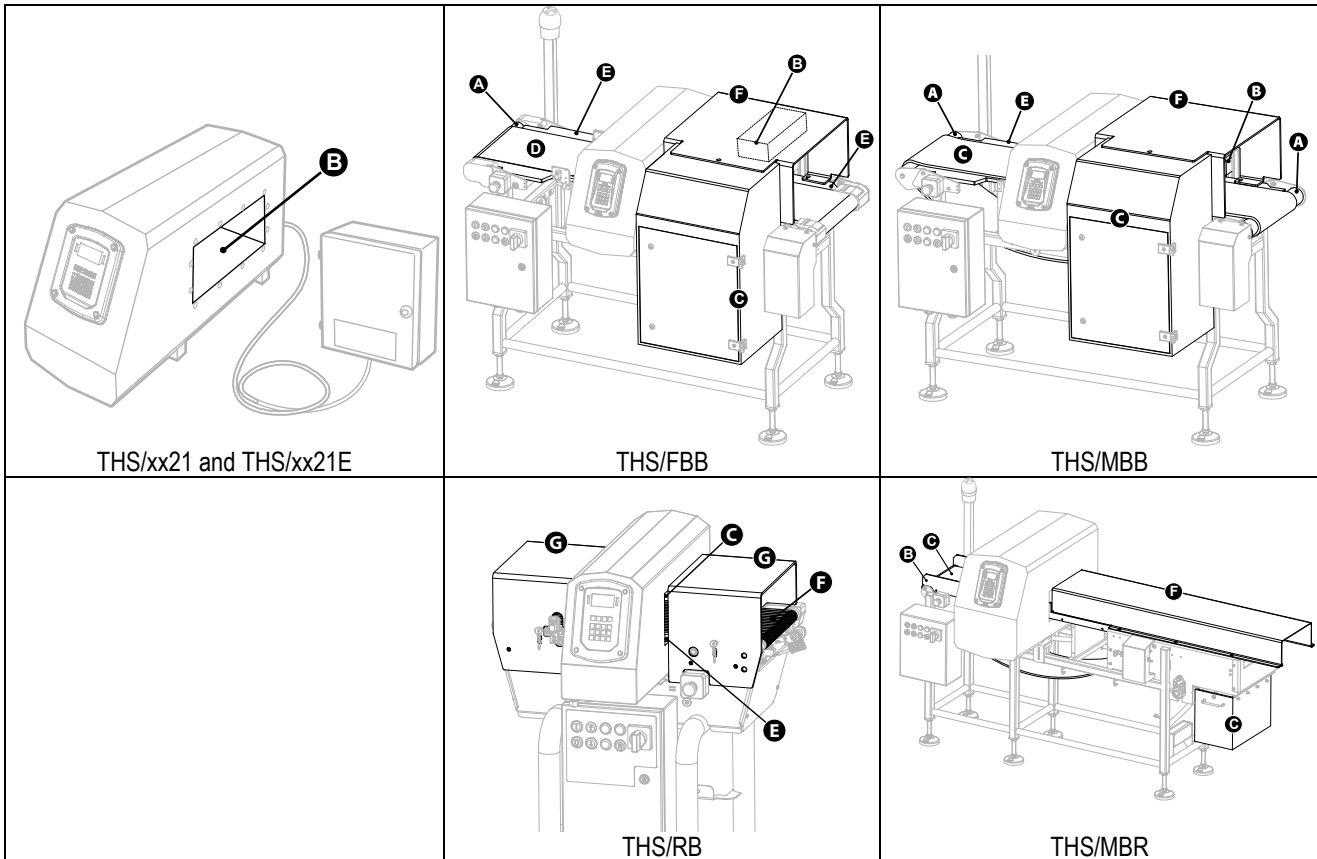
All cleaning procedures shall be compatible with the System protection degree.

4.2.2 Cleaning parts in contact with the product



The end user is responsible for the compilation of a washing procedure in conformity with the product to be inspected and must be careful that none of the parts get damaged during maintenance.

During cleaning operations it is recommended to use cleaning products compatible with the materials. Below is a table with some common products:



		A	B	C	D	E	F	G
Water	up to 50°C	●	●	●	●	●	●	●
	up to 80°C	●	×	×	×	●	×	×
Alkali- and acid-based cleaning agents		Check the compatibility of the product with the materials used. CEIA can supply details of material characteristics on request.						
Soapy solution		●	●	●	●	●	●	●
Hydrogen peroxide	up to 10%	●	●	●	●	●	●	●
Alcohol	up to 30%	●	●	●	×	×	×	×
Ammonia solution		●	×	×	●	×	×	×

● Usable

× Non-usable



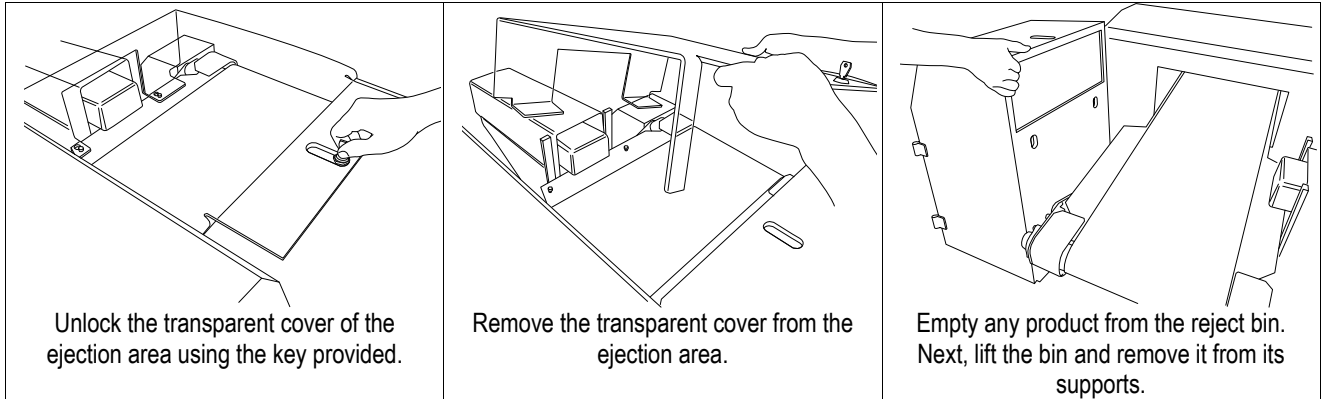
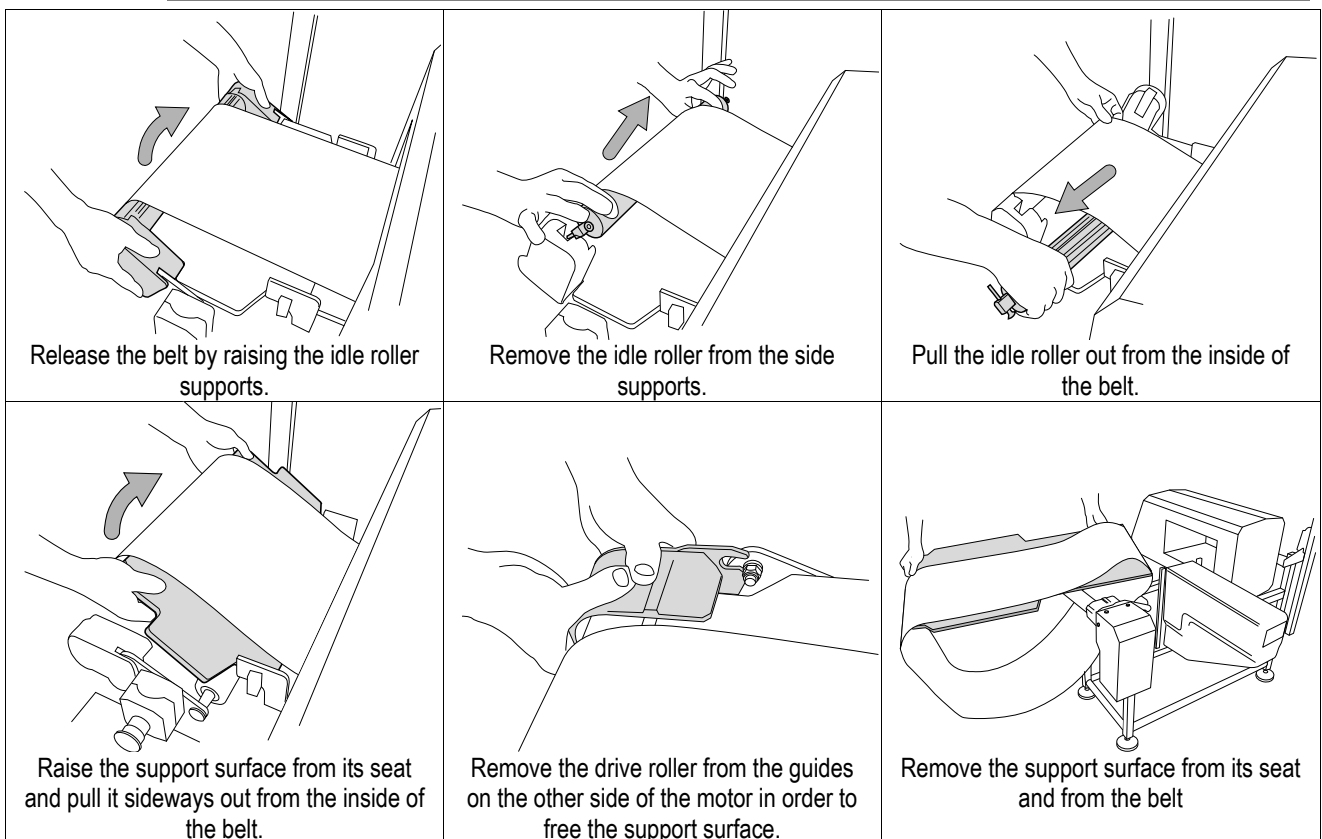
All cleaning procedures shall be compatible with the System protection degree.

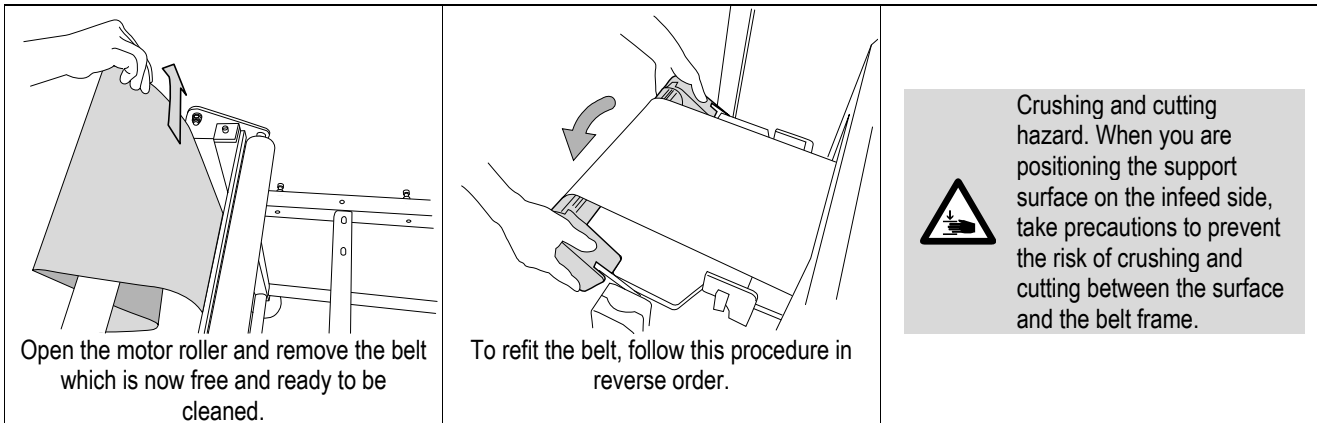
4.2.2.1 THS/FBB

Shut down the system at the main ON-OFF switch.

Ejection system

If the conveyor belt is fitted with an ejection system, perform the following steps, before continuing:


Belt disassembly


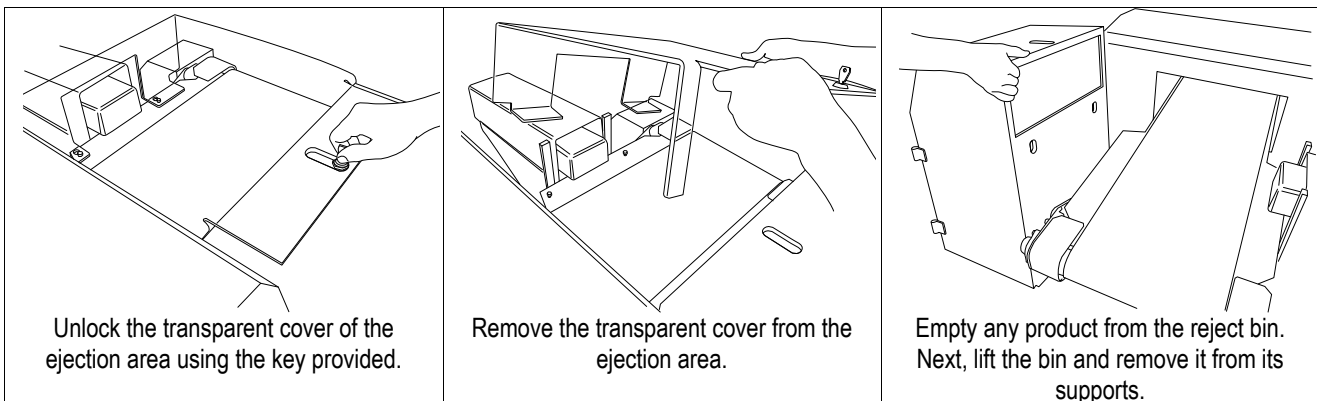


4.2.2.2 THS/MBB

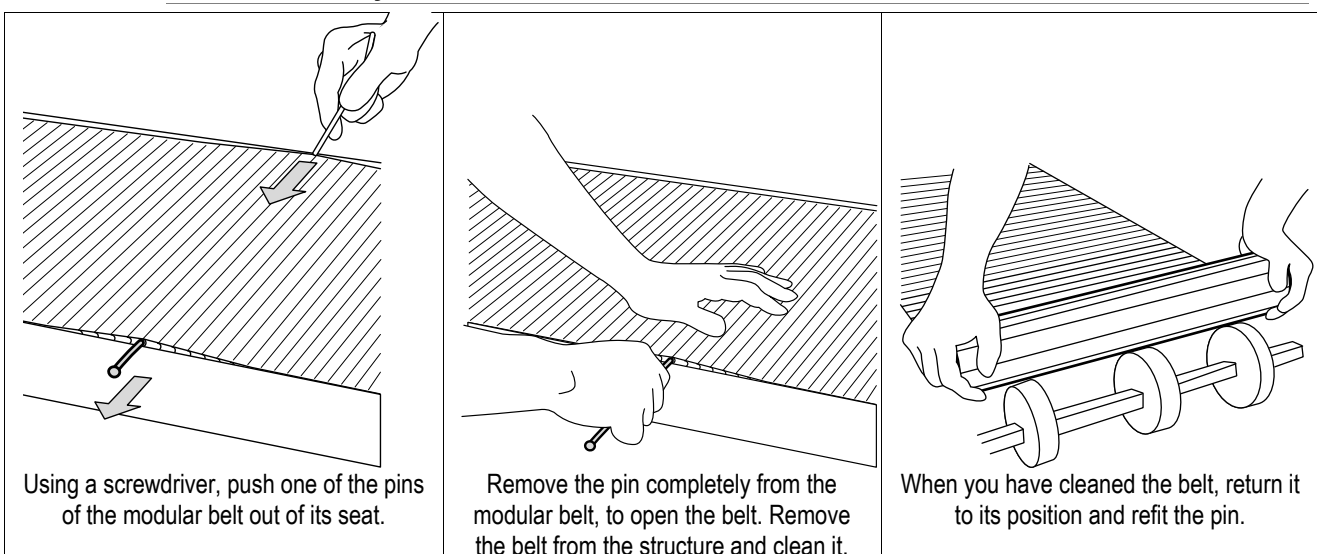
Shut down the system at the main ON-OFF switch.

Ejection system

If the conveyor belt is fitted with an ejection system, perform the following steps, before continuing:

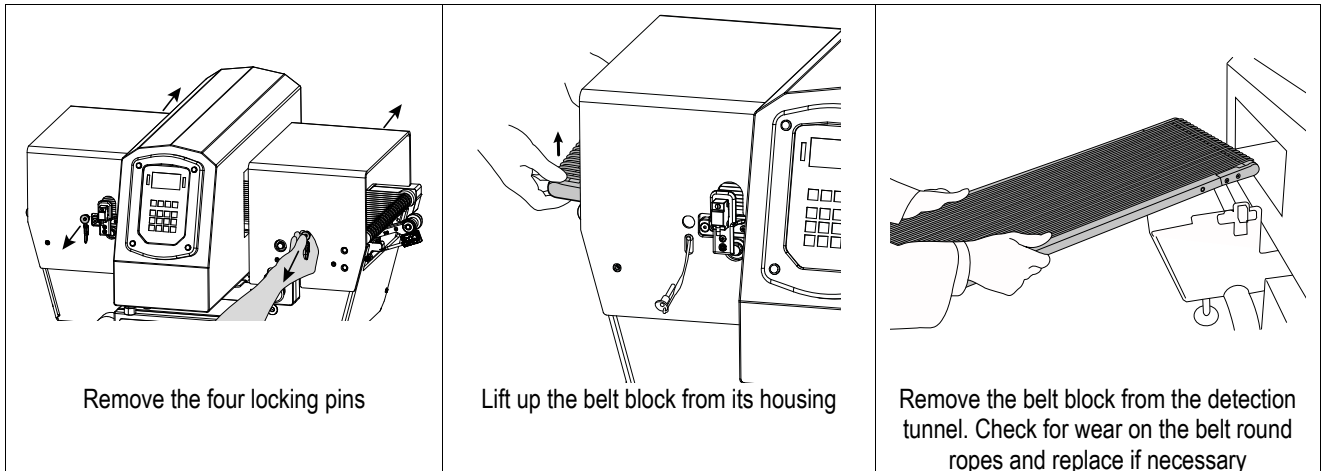


Belt disassembly



4.2.2.3 THS/RB

Shut down the system at the main ON-OFF switch.



Follow the procedure in reverse to re-assembly the tape.

Pay attention to the hands during the placement of the belt block, in order to avoid the risk of shearing between the belt block and the belt frame.

4.2.2.4 THS/PL21

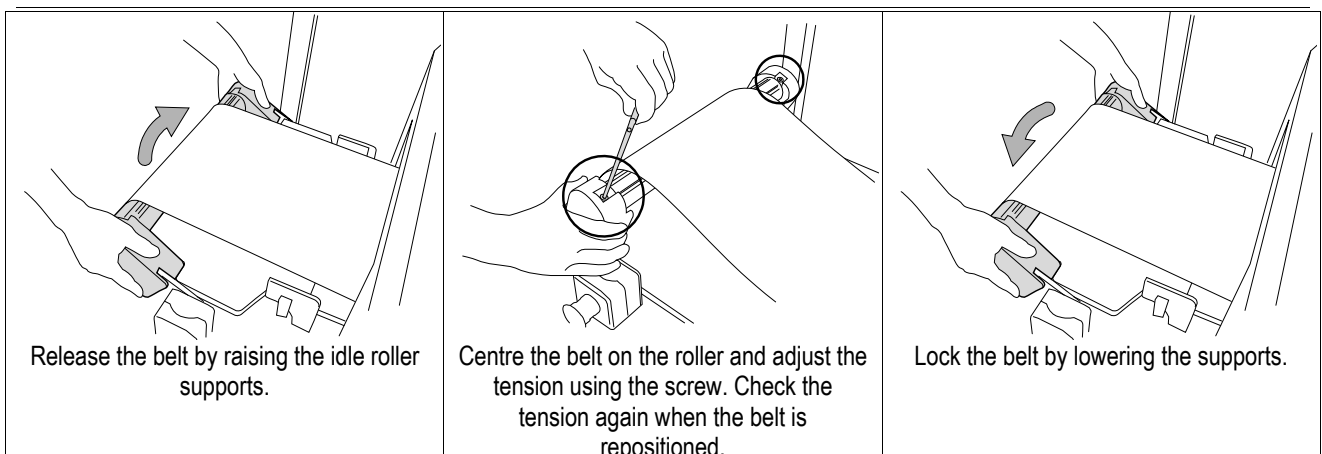
The cleaning of the transit pipe and all parts in contact with the product shall be performed by the Maintenance personnel.

4.2.2.5 THS/PLV21

The cleaning of the ejection valve shall be performed by the Maintenance personnel.

4.2.2.6 THS/FFV21

The cleaning of the ejection valve shall be performed by the Maintenance personnel.

4.2.3 Conveyor belt tension adjustment
4.2.3.1 THS/FBB


4.3 Troubleshooting



All the power supply voltages in the power supply card are protected by self-resetting fuses. This type of fuse triggers when there is an overload or a faulty connection, for the voltage values on the card, **except for the mains voltage**. Refer to the description of the inputs and outputs.

The THS systems have a self-diagnostic system which displays error messages, closely related to the operation of the Metal Detector or to controls activated on the system input lines. For these messages, refer to the **Self-diagnostic** section.

For fault conditions not indicated because of faulty electrical installation or faulty configuration of the Metal Detector, see the following table:

Problem	Possible causes	Solutions
Control panel display and indicators OFF; Internal buzzer OFF; Metal Detector NOT detecting metal masses.	System not powered	<i>Check the system is powered and the main switch is set to I.</i>
	System power failure	<i>Contact the Maintenance Service</i>
Control panel display and indicators OFF; Internal buzzer OFF; Metal Detector detects metal masses.	Control panel failure	<i>Contact the Maintenance Service</i>
Control panel display OFF or flashing; Control panel indicators ON; Internal buzzer OFF. Metal Detector NOT operative.	Fault on component/s connected to the system cards	<i>Contact the Maintenance Service</i>
The Metal Detector does not provide alarms when one or more test samples are used	Incorrect detection parameters for the current product	<i>Check that the correct Product has been selected</i>
	Test sample diameter unsuitable for the current product or for the Metal Detector model	<i>Check that the samples are those specified for the quality testing of the current product.</i>
	Transit speed higher than settings	<i>Contact the Maintenance Service</i>
	Incorrect Sensitivity value	<i>Increase the Sensitivity level, according to the operative conditions, until detecting all Test Samples</i>
	Incorrect detection parameters	<i>Contact the Maintenance Service</i>
Ejection not activated after an alarm	Fault of electrical and pneumatic components or ejector connections	<i>Contact the Maintenance Service</i>
	Incorrect reading of the synchronization photocell	<i>Check that the photocell is correctly aligned with its reflector. Check that it is not obstructed. If the problem persists, contact the Maintenance Service.</i>
	Transport stopped	<i>Start the transport. If the problem persists, contact the Maintenance Service.</i>
Metal Detector utters alarms with product transport deactivated	Interference with an adjacent Metal Detector	<i>Contact the Maintenance Service to check that different transmission channels will be selected</i>
	Electrical or mechanical interference from other in-line machines	<i>Contact the Maintenance Service to perform the General Compatibility Check procedure and locate possible noise sources</i>
	Metal Detector fault	<i>Contact the Maintenance Service</i>

Problem	Possible causes	Solutions
The Metal Detector provides false alarms only with the conveyor ON	Electrical or mechanical interference from other in-line machines	Contact the Maintenance Service to perform the General Compatibility Check procedure and locate possible noise sources
	Conveyor belt contamination (if present)	Clean the belt or, if needed, replace it.
	Incorrect detection parameters	Check that the correct Product has been selected for the current product in transit. If the problem persists, contact the Assistance Service
It is not possible to reset the System after an alarm or a fault	The transport was stopped before the end of the ejection cycle.	Restart the transport and complete the ejection cycle for manually removing contaminated product.
On CCS , after the belt is started, it remains stopped and the Motor ON ► indicator does not light up	Internal connections malfunction	Contact the Maintenance Service
	Incorrect configuration settings	Contact the Maintenance Service
On CCS , after the belt is started, it remains stopped and the Motor ON ► indicator light up in a permanent way or only when the start button is pressed	Internal connections malfunction	Contact the Maintenance Service
	Incorrect configuration settings	Contact the Maintenance Service
On CCS , after the belt is started, it remains stopped and the Motor ON ► indicator flashes	Enable signal (from a downstream or upstream machine connected to the system) not activated	Start the machine that gives the consent signal. If the problem persists, contact the Maintenance Service



Check that each sensor activates its corresponding diagnostic message efficiently. This is to ensure that the correct diagnostic message is displayed in the event of a fault.

4.5 Self-diagnostic

The internal diagnostic system monitors the operational status of the Metal Detector, of the integrated conveyor system and of the connected sensors.

In the event that a diagnostic status is activated, the system will automatically perform the following actions:

- The message corresponding to the diagnostic status is shown on the display.
- The alarm warning lights and buzzers will be triggered as indicated in the *Instructions for Use* section.
- The READY RELAY is deactivated.
- The integrated conveyor belt is stopped (this function can be disabled).
- The ejection system is activated (this function can be disabled).

The section below describes all the diagnostic messages and the related corrective actions.

Once the cause has been traced and removed, some faults are self-resetting (indicated by **A**) while others require manual resetting (indicated by **M**).

The diagnosis indicated by **P** can be automatically or manually reset, according to the programming of the relative parameters PFR and SFR.

Use the **I/O status** menu to check the sensors connected and to display the state of the input and output lines.

See the electrical diagrams accompanying this manual.



The system is configured in our production facility to also activate the ejection system (via the EJECT NO, EJECT NC outputs) in the event of a power failure. For a full description, see Inputs (SW1).

4.5.1 Diagnostics of the Metal Detector and of the integrated conveyor system

Message	Probable cause	Action	Type	
MOTOR FAULT (X)	Inverter faulty or programmed incorrectly. Motor fault. X: Fault identification code.		-	
	F3	No power	Contact the Maintenance Service, reporting the Fault identification code.	M
	F4	Undervoltage		A
	F5	Overvoltage		A
	F6	Motor stalled		A
	F7	Motor overload		A
	F8	Heat sink overtemperature		A
	F13	Earth fault		M
	F38 F39 F40	Phase to earth		M
	F41 F42 F43	Phase-phase short circuit		M
	F64	Driver overload		M
F122	Inverter I/O card faulty	M		
MOTOR FAULT(AUX)	Inverter connection problem	Contact the Maintenance Service.	M	
POW. SUPPLY FAULT	ALM or SCD card power supply section faulty	Contact the Maintenance Service.	A	
NO COMMUNICATION	Communication fault between SCD and ALM cards	Contact the Maintenance Service.	A	
SELF-BALANCING	The Metal Detector is performing the automatic balancing procedure.	Wait until the end of the procedure.	A	
EMERGENCY	The Emergency circuit has been activated by pressing one of the System Emergency buttons	Release the emergency stop button. Reset the emergency.	-	
		Where no emergency stop buttons are present, contact the Maintenance Service		
EXTERN EMERGENCY	The Emergency circuit has been activated by pressing one of the external Emergency buttons	Release the emergency stop button. Reset the emergency.	-	
		Where no external emergency stop buttons are present, contact the Maintenance Service		
GUARD EMERGENCY	The Emergency circuit has been activated by opening a guard	Close back the guard	-	
		In Systems where no Emergency Guard is provided, contact the Maintenance Service		
COMPATIBIL.ERROR	SCD card incompatible with the SPM card data	Contact the Maintenance Service.	-	

Message	Probable cause	Action	Type
PROBE FAULT(X)	Connections of the detection probe cable interrupted or detection probe faulty. X: Fault identification code.	Contact the Maintenance Service, reporting the Fault identification code.	P
EMERG.CIRC.FAULT	Emergency circuit fault (any variation to the valid connections status for the Emergency and Guard Emergency conditions)	Contact the Maintenance Service.	-
SCD CARD FAULT (X)	SCD card faulty	Contact the Maintenance Service, reporting the Fault identification code.	-
Vin FAULT	Vin voltage fault Possible short circuit or wrong connection of an input device	Contact the Maintenance Service.	A
Vout FAULT	Vout voltage faulty Possible short circuit or wrong connection of an output device	Contact the Maintenance Service.	A
INVERTER NOT RESP	There is no communication between the inverter and the ALM card.	Contact the Maintenance Service.	A
NO CONNECTION	Communication fault between SCD and ALM cards	Contact the Maintenance Service.	A
	Communication fault between the RCU and ALM cards		
RESET EMERGENCY	An Emergency manual reset is requested after the condition removal or after switch ON of the System	Press (R) button on CCS , or (E) on CPB , to reset the System. In systems not equipped with Emergency devices or Emergency reset buttons, contact the Maintenance Service.	-
SPM NOT DETECTED	Memory faulty or missing (THS system not operational)	Contact the Maintenance Service.	-
V SUPPLY TOO HIGH	The 24V power supply to the power supply card is too high	Contact the Maintenance Service.	A

4.5.2 Diagnostics of the connected sensors and additional controls



On CEIA Integrated Systems, the diagnostics for the sensors already fitted have already been programmed in our production facility and are the default settings.

Message	Probable cause	Action	Type
LOGIN RESTRICTED	Three consecutive failed attempts to access the programming mode (from local or from remote station).	The fault is reset automatically when the system administrator enters the programming mode. Alternatively, contact CEIA for the password recovery procedure.	-
Not_sync.alarm	A metal alarm occurred without the passage of any product	Check the absence of electric interferences. Check that the photocell is correctly positioned and operating. Verify that the alarm was not caused accidentally by an operator.	M
ALARM TOO BIG	Metal alarm amplitude too large	Check for the presence of large metallic masses in the product passed through the unit.	M
CEN.BELT FAULT(0)	Belt centering photocells activated continuously and at the same time	Remove any obstructions. If the problem persists, contact the Maintenance Service.	P
CEN.BELT FAULT(1)	Prolonged activation of a belt centering piston	Check the belt alignment. Check the centering photocells for obstructions. If the problem persists, contact the Maintenance Service.	M
EJECT.OUT OF ORDER	Incorrect Ejector position or movement	Check that the ejector is not blocked and that it is correctly working.	P
	Self-diagnostic not set correctly	Contact the Maintenance Service.	
	The sensors connected to the inputs EJ.CONFIRMATION and EJ.POSITION CHECK are disconnected or faulty.	Contact the Maintenance Service.	
BIN ABSENT	Reject product bin not present or incorrectly positioned	Put the bin back in the correct position.	P
	Self-diagnostic not set correctly	Contact the Maintenance Service.	
	The sensor connected to the BIN ABSENT input is faulty or disconnected	Contact the Maintenance Service.	
BIN FULL	Reject bin full	Empty the bin.	P
	Self-diagnostic not set correctly	Contact the Maintenance Service.	
	The sensor connected to the BIN FULL input is faulty or disconnected	Contact the Maintenance Service.	
NO EJECT.CONFIRM	Product ejection not confirmed correctly	Check that the ejector is correctly activated and that the contaminated product is properly ejected.	M
	Self-diagnostic not set correctly	Contact the Maintenance Service.	
	The sensor connected to the EJ.CONFIRMATION input is faulty or disconnected	Contact the Maintenance Service.	

Message	Probable cause	Action	Type
EJECT CHECK FAULT	Product passed in front of the Ejection Check sensor during an ejection	Remove the product not ejected.	M
	Self-diagnostic not set correctly	Contact the Maintenance Service.	
	The sensor connected to the EJECTION CHECK input is faulty or disconnected	Contact the Maintenance Service.	
SYNC PHOTOC.FAULT	Product jammed in front of the synchronization photocell sensor	Remove the jammed product.	P
	Self-diagnostic not set correctly	Contact the Maintenance Service.	
	The sensor connected to the PHOTOCCELL input is faulty or disconnected	Contact the Maintenance Service.	
CHECK PHOTC.FAULT	Product jammed in front of the Ejection Check sensor	Remove the jammed product.	P
	Self-diagnostic not set correctly	Contact the Maintenance Service.	
	The sensor connected to the EJECTION CHECK input is faulty or disconnected	Contact the Maintenance Service.	
SYNC/CHK PH.FAULT	Pack not correctly detected by both Synchronization and Ejection Check photocells	Verify the correct packs flow in front of both photocells.	P
	Self-diagnosis not correctly set	Contact the Maintenance Service.	
	Synchronization or Ejection Check photocell, faulty or disconnected	Contact the Maintenance Service.	
ENCD.FRQ.TOO HIGH	The speed measured by the encoder is higher than BM (CPB) or higher than 1.3 BM (CCS) for 10 seconds	Check that the conveyor belt is moving correctly. If the problem persists, contact the Maintenance Service.	M
ENCOD.FRQ.TOO LOW	The speed measured by the encoder is lower than BL (CPB) or lower than 0.7 BL (CCS) for 10 seconds		
ALR RATE TOO HIGH	Number of alarms higher than permitted maximum (see ART, ARP and EMEX parameters)	Depending on the parameters set, reset the alarm counter or just reset the fault.	M
EVENT BUFFER FULL	Events memory is full	Contact the programming and data management supervisor to save or print the events	-
LOW AIR PRESSURE	Compressed air supply pressure too low	Check the compressed air supply connection and pressure.	P
	Self-diagnostic not set correctly	Contact the Maintenance Service.	
	The sensor connected to the LOW PRESSURE input is faulty or disconnected	Contact the Maintenance Service.	

Message	Probable cause	Action	Type
EJECT.SYSTEM JAM	Ejection system jammed	Check that the ejector is not blocked in the ejection position. Check that there is no product jammed in front of the Ejection Confirmation sensor.	P
	The sensor connected to the EJ.CONFIRMATION input is faulty or disconnected	Contact the Maintenance Service.	
TEST TIME OUT	Maximum timeout for pre-programmed test	Reset the fault and then run the test. With FT = OFF, the message is shown but the fault is not activated.	M
TEST FAILED	The test has failed	Reset the fault. Check for the causes in section 4.8 and repeat the test. With FF = OFF, the message is shown but the fault is not activated.	M
FAILSAFE FAILED	One of the tests planned for the Fail-Safe Test has failed	Check the correct functioning and programming of the involved sensors. The Test can be repeated after the reset.	M

4.5.3 Warning messages

Some conditions cause a warning message to be displayed but do not activate the fault:

Message	Cause	Action
AUTOLEARN ABORTED	TA self-learn interrupted	Check that there is no noise or vibration during the procedure. Repeat the procedure. If the procedure is interrupted because of a fault, check the message on the display.
WAIT UPDATING CONFIG.	A configuration update is in progress (e.g. start-up, transmission channel modification)	Wait until the end of the procedure. The ejection system is activated during the procedure. The message is also shown during the Metal Detector start-up. In this case the READY RELAY is also deactivated until the end of the Metal Detector start-up.
REMOTE CONTROL ACTIVE	Remote control ON	The message is shown when and a remote control device is ON and when virtual remoting commands are in continuous use. In these cases the message is displayed on the main control panel and the keypad is deactivated.
Detect. inhibited	The Metal Detector is inhibited by an external device connected to the INHIBITION input	If the Metal Detector remains continuously inhibited, contact the Maintenance Service.
Enforced eject	Enforced product ejection	Product ejection has been triggered by activation of the INHIBITION input.
EJECTION MUST BE ON	Ejection is disabled at the test start-up	Activate the ejection system before you start a test.
EJECTION IN PROGRESS	Previous ejection not completed at test start-up	In the ejection mode with belt stop, complete the ejection cycle before you start the test.
EJECTION OFF	The Metal Detector ejection system has been disabled	This function will be automatically enabled at the system restart or can be enabled by manually reactivating the relevant parameter.
TRANSMISSION OFF	The transmission is OFF.	This function will be automatically enabled at the system restart or can be enabled by manually reactivating the relevant parameter.
TRANSPORT STOPPED	The system is waiting for the enabling signal.	Start the system that gives the enabling signal. If the message continues to appear, contact the Maintenance Service.
WARN: IXC timeout	The IXC card is disconnected or faulty	Switch the Metal Detector OFF and ON. If the problem persists, contact the Maintenance Service.
WARN: Valve service	The number of expulsions for which valve maintenance is recommended has been reached	Contact the Maintenance Service.
DEFAULT not modifiable	Inhibited attempt to modification of a detection or ejection parameter of the DEFAULT product	Select a different Product or create a new one.