

## VLB SERIES

### HAND-FOOT-CLOTHING MONITOR



TD\_VLB-SERIES\_R3\_ENG – 19/12/18



# COMECER

ISO 9001 & ISO 13485 Certified Quality System



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**PLEASE NOTE**

*The photos and images provided are purely informative. Consequently, they cannot represent the type of equipment specifically installed.*

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## **1** OVERVIEW

### **1.1** OVERVIEW

The new hand-foot-clothing monitors VLB-303-2 and VLB-303-4 are based upon the award winning design of the VLB-202, where a small footprint, a robust stainless steel surface and a detection technology based on failure-safe plastic scintillation detectors are the key features. The plastic scintillation detectors are developed specifically to measure the beta and gamma emitting isotopes that are used in the Nuclear Medicine departments.

VLB-303-2 model is one of the most economical hand-foot-clothing monitors on the market. It uses two plastic scintillation detectors, one patented double-sided hands detector and one foot detector. The detachable hand detector can also be used to measure the clothes or to determine which foot is contaminated.

VLB-303-4 model uses four plastic scintillation detectors, one for each hand and one for each foot. The detachable hand detectors can be used to measure the clothes.



### **1.2** REFERENCE STANDARDS

- NEN-EN-IEC 61010:2010, IDT Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1 General requirements.
- NEN-EN-IEC 61326-1:2005 Electrical equipment for measurement, control and laboratory use – EMC requirements.
- NEN-EN-IEC 61098:2003, MOD Radiation protection instrumentation – Installed personnel surface contamination monitoring assemblies.

### 1.3 EQUIPMENT LINES

*VLB-303-2 TWO DETECTORS HAND-FOOT-CLOTHING MONITOR*

*VLB-303-4 FOUR DETECTORS HAND-FOOT-CLOTHING MONITOR*

### 1.4 THE MAIN EQUIPMENT

Models		
Main equipments	VLB-303-2	VLB-303-4
Number of hand detectors	1	2
Number of foot detectors	1	2
Number of clothes detectors	1 (The detachable hand detector)	2 (The detachable hand detectors)
Display touch screen 5.7", LCD	S	S
Ethernet interface	S	S
Number of selectable isotopes	19	19
Number of definable isotopes	Virtually unlimited	Virtually unlimited
Background subtraction	S	S
VERA 303 Software	O	O
Collimator Protection Foil	O	O

*S= Standard; O= Option; R= Configurable when placing order*

## 2 CONSTRUCTIONAL FEATURES

### 2.1 DESCRIPTION OF MAIN COMPONENTS

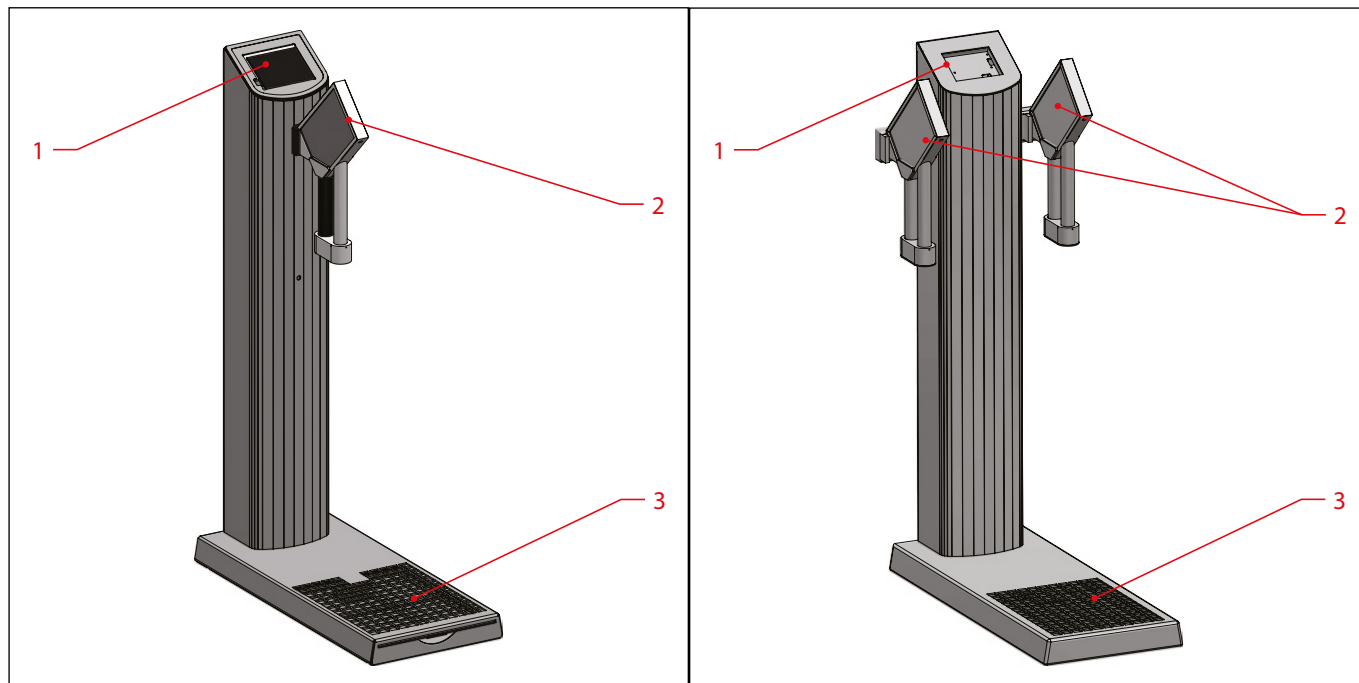


Fig. 1 VLB-303-2

Fig. 2 VLB-303-4

Ref.	Description
1	Touch screen operator panel
2	Hand/cloth detector
3	Foot detector

## **2.2 MACHINE STRUCTURE**

### **2.2.1 Structure**

Stainless steel structure

### **2.2.2 Activity Detectors**

On the VLB-303-2:

- one plastic scintillator for hands, 240 cm<sup>2</sup>, sensitive on both sides;
- one plastic scintillator for feet, 1050 cm<sup>2</sup>.

On the VLB-303-4:

- two plastic scintillator for hands, 240 cm<sup>2</sup>;
- two plastic scintillator for feet, 525 cm<sup>2</sup>.

## **2.3 CONTROL PANEL**

Both models VLB-303-2 and VLB-303-4 are equipped with an easy-to-use, colored LCD touch screen display (5,7"). The Settings menu is password-protected.

## 3 FUNCTIONALITIES

After connecting the main power cable, the VLB measure the background level over a certain period of time. This period of time is user definable. The VLB is ready for use straight away, however after 10 minutes an exact background is determined. The user is notified of all passages by messages on the touch screen.

When the system is ready, the operator can:

- Start measurement;
- Change the selected isotope pressing the corresponding button;
- Enter the Settings menu.



### **IMPORTANT NOTE**

***Measurement of the probes is influenced by the presence of nearby radioactive sources. For correct installation of the devices it is important to verify that the background in the environment is negligible, which is generally below 400 cps for all probes. In addition, the movement of radioactive sources close to the system during a measurement operation can affect the sensitivity of the device.***

### 3.1 MEASUREMENTS

Hand-foot measurement starts when all the detectors are activated by a part. The display shows the status of the measure. At the end of the measure, the system generates different screen messages and acoustic signals, depending if there is contamination or not.

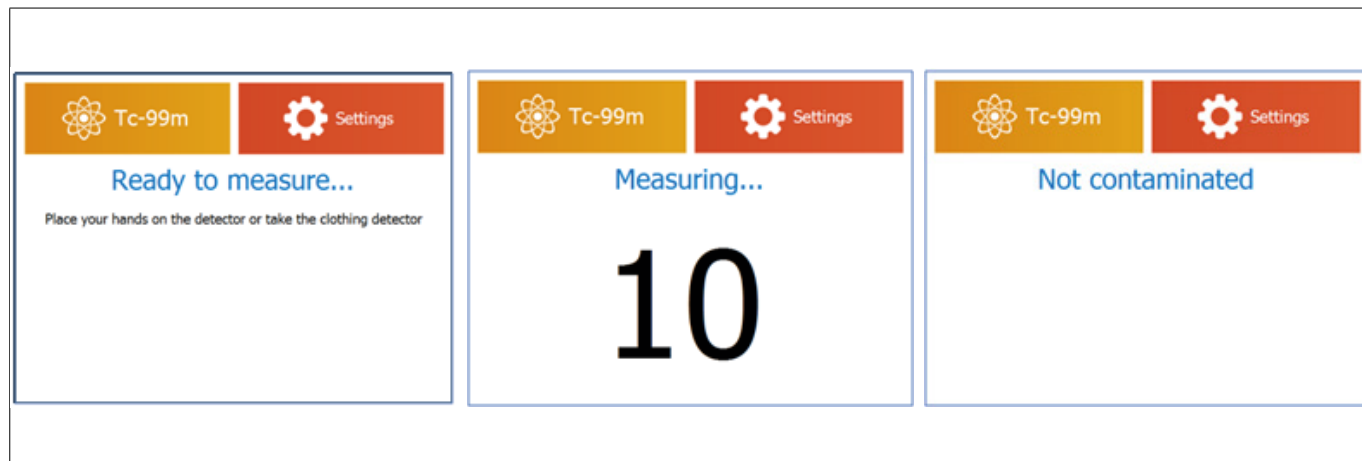


Fig. 3 Sequence of screenshots in case of measurements without contamination

In case of contamination in the VLB-303-2 model, the system asks to the user to measure the single parts one by one, to detect which is contaminated.

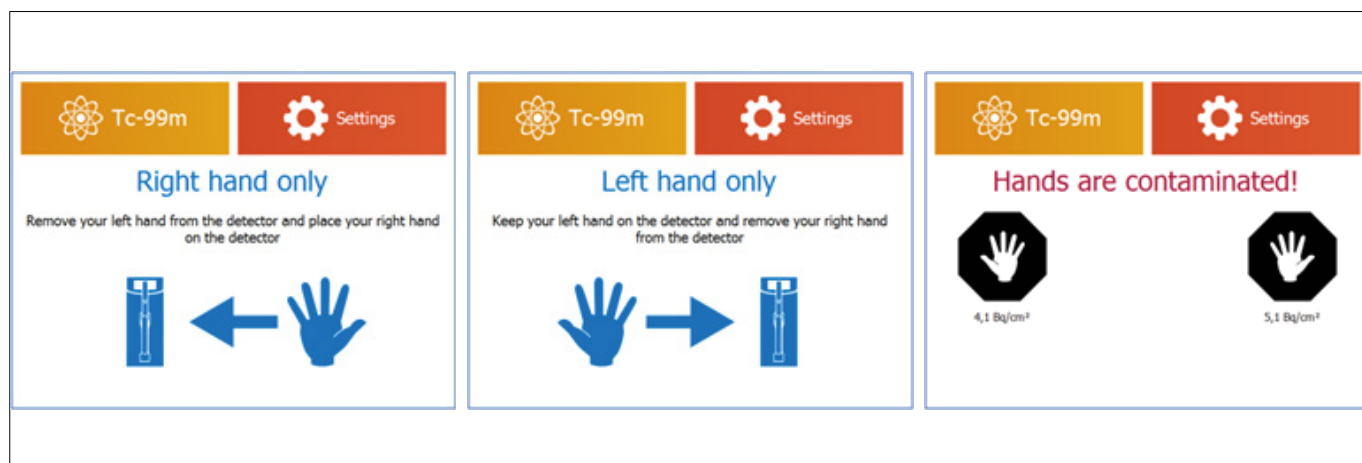


Fig. 4 Sequence of screenshots in case of hands contamination (VLB-303-2 model)

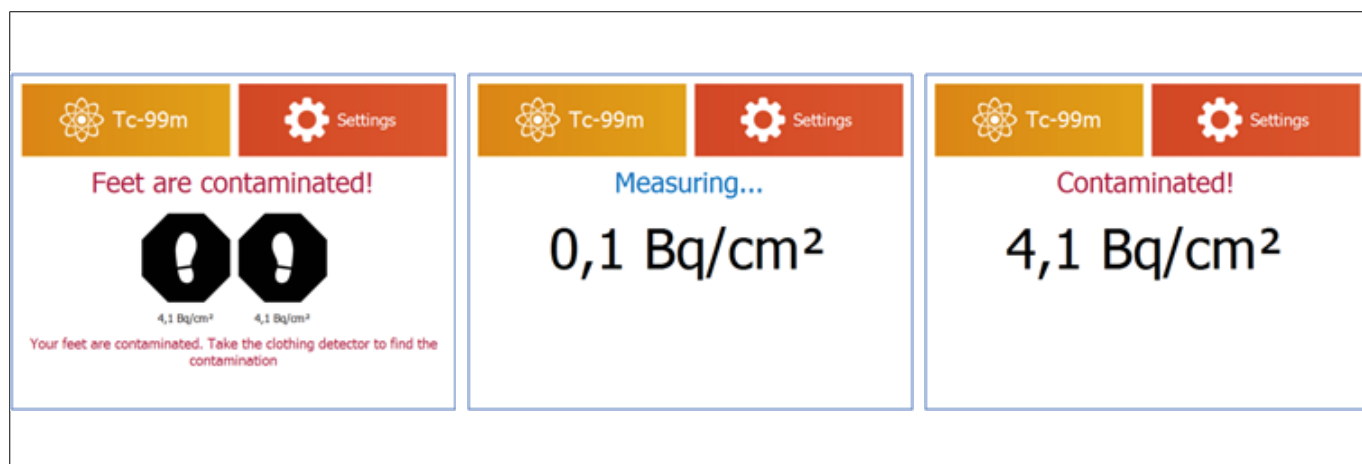


Fig. 5 Sequence of screenshots in case of feet contamination (VLB-303-2 model)

### 3.2 CHANGING THE SELECTED ISOTOPE

In the system there are 19 isotopes pre-configured. To view them, the operator should press the “Isotope” button.

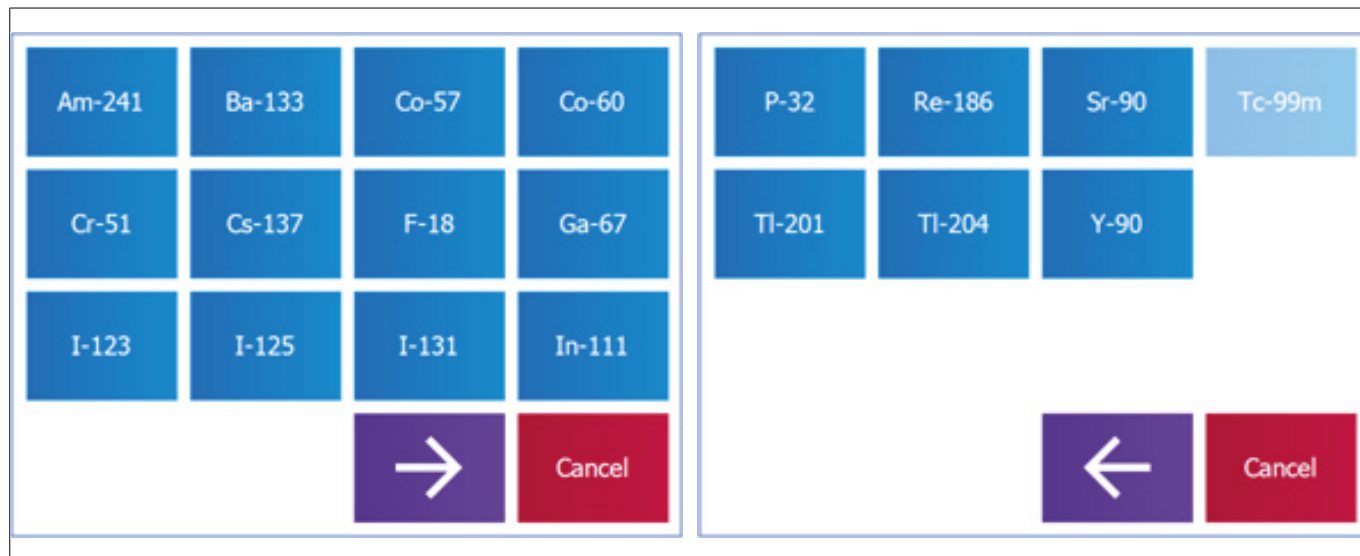


Fig. 6 Isotopes list

#### 3.2.1 Efficiency factors

Isotope	Efficiency foot detector (%)	Efficiency hand detector (%)
Am-241	1.9	2.7
Ba-133	32	21.2
Co-57	15.5	11.3
Co-60	28.9	19.2
Cs-137	15.4	9.9
Cr-51	1.2	0.6
F-18	21.5	11.8
Ga-67	10.2	7.3
I-123	11.1	7.4
I-125	4.1	4.3
I-131	22.9	12.3
In-111	20.9	13.2
P-32	8.9	13.8
Re-186	4.5	4.6
Sr-90	4.8	6.9
Tc-99m	11.7	7.6
Tl-201	6.6	6.8
Tl-204	1.6	2.4
Y-90	4.8	6.9

### 3.3 SETTINGS MENU

After pressing the “Settings button”, the system asks the password to enter in the Settings menu. After authentication the Settings menu will be available.

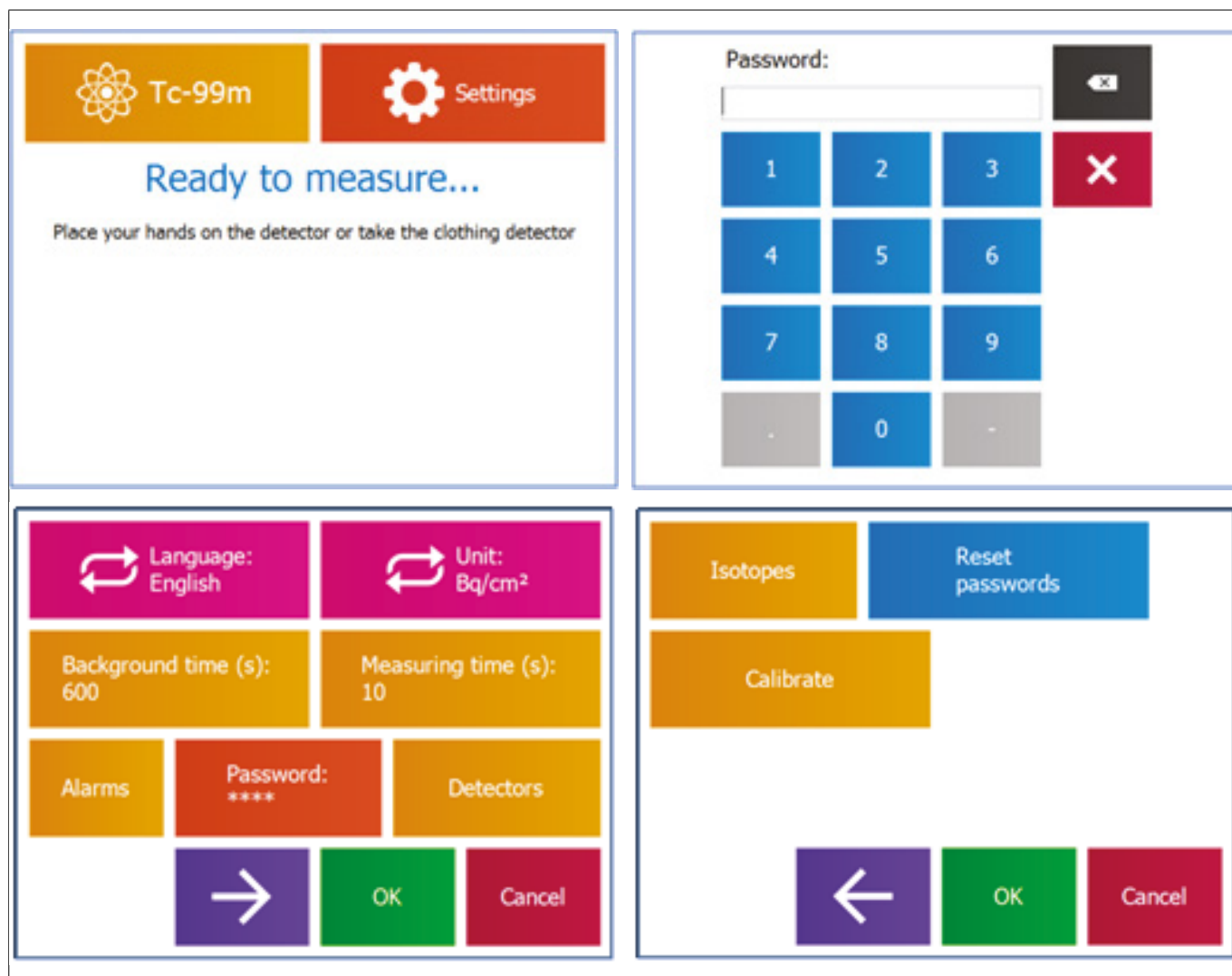


Fig. 7 Sequence of screenshots to enter in the settings menu

From the Settings menu is possible to:

- Select language
- Change the unit of measurement (Bq/cm<sup>2</sup> or CPS)
- Change the background time (adjustable between 60-600 seconds)
- Change the measuring time (adjustable between 1 and 99 seconds)
- Manage contamination alarms (adjustable per detector between 1-9999 CPS or 0.1 – 999 Bq/cm<sup>2</sup> (default 4 Bq/cm<sup>2</sup>))
- Change password
- Disable detector (useful when a detector is out of order)
- Set unlimited user-definable efficiency factors
- Reset passwords
- Calibrate the system

### 3.3.1 Changing time

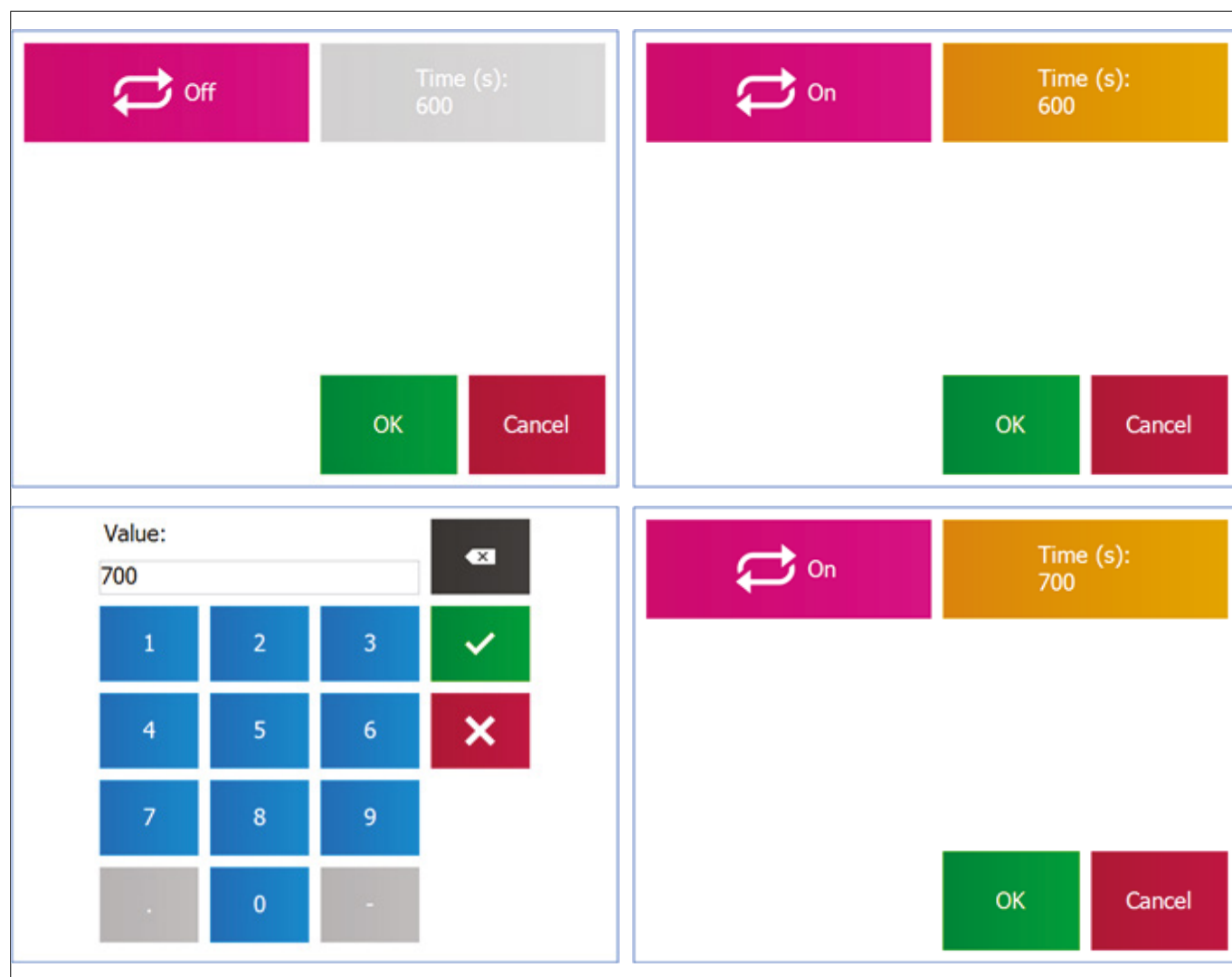


Fig. 8 Sequence of screenshots to change background or measurement time

### 3.3.2 Manage contamination alarms

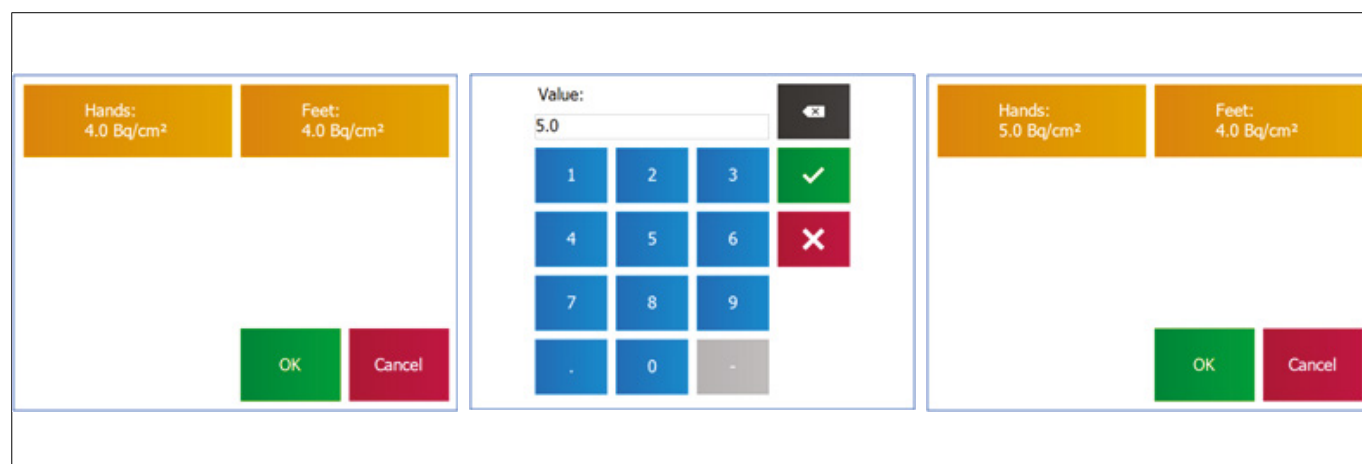
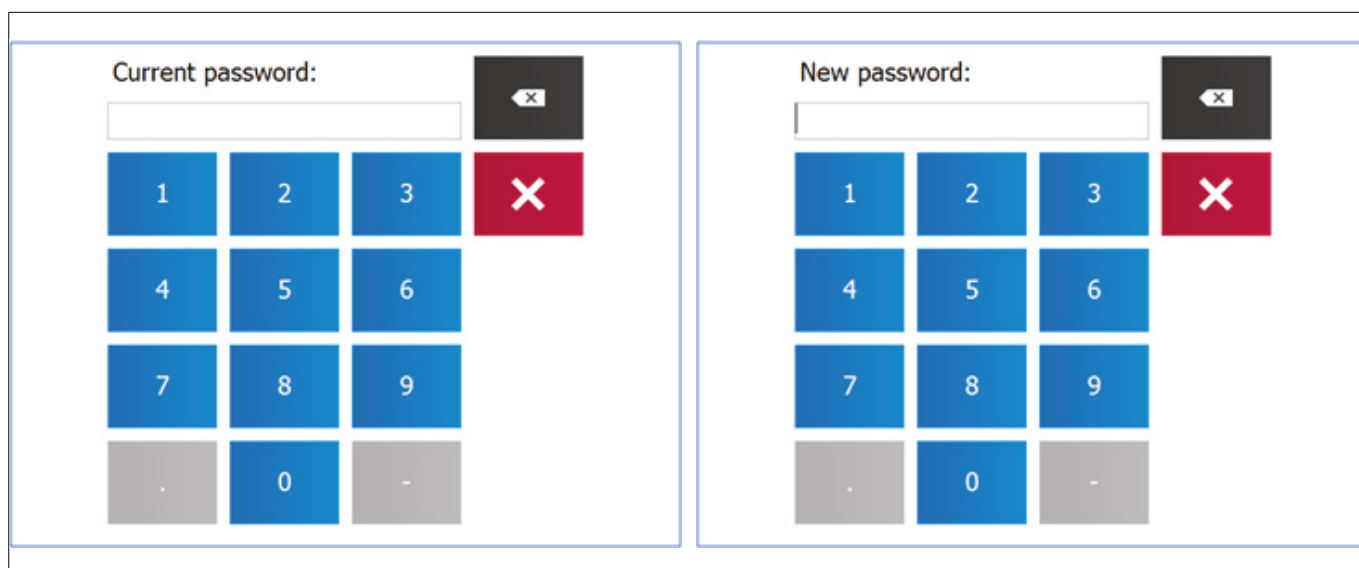


Fig. 9 Sequence of screenshots to manage contamination alarms

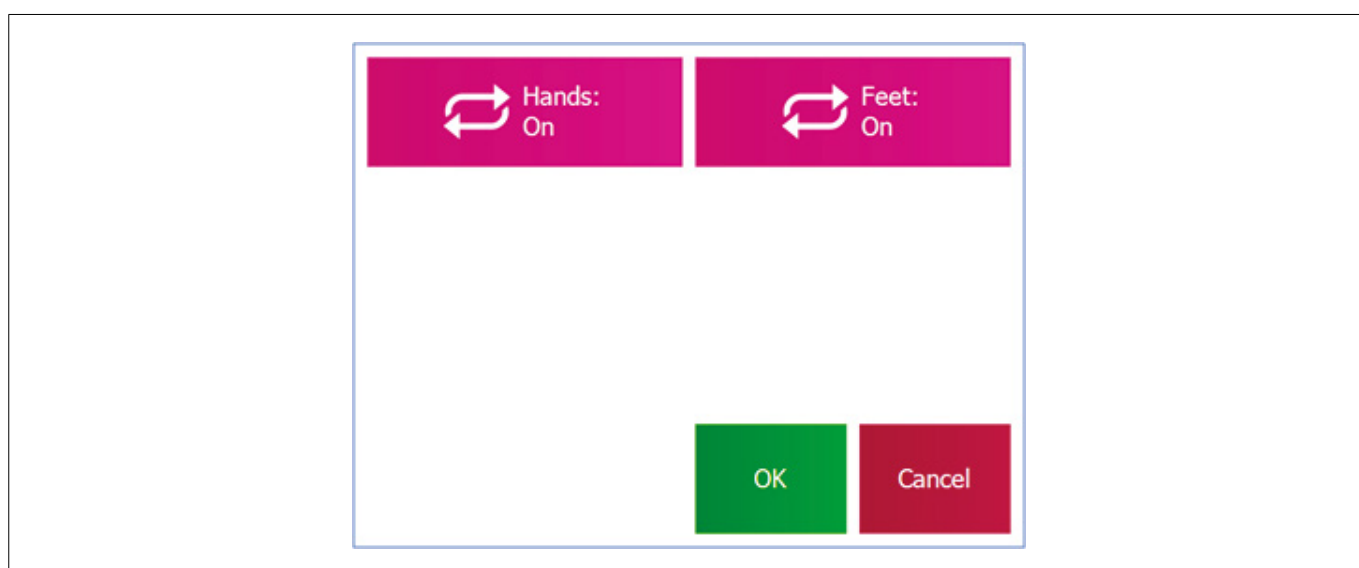
### 3.3.3 Change password



The figure shows two side-by-side screenshots of a password change interface. Each screenshot features a text input field at the top, a black button with a white 'X' icon to its right, and a numeric keypad below. The keypad consists of blue buttons for digits 1-9 and 0, and grey buttons for a decimal point and a minus sign. A red button with a white 'X' icon is positioned to the right of the keypad. The left screenshot is labeled 'Current password:' and the right is labeled 'New password:'.

Fig. 10 Sequence of screenshots to change password

### 3.3.4 Disable detector

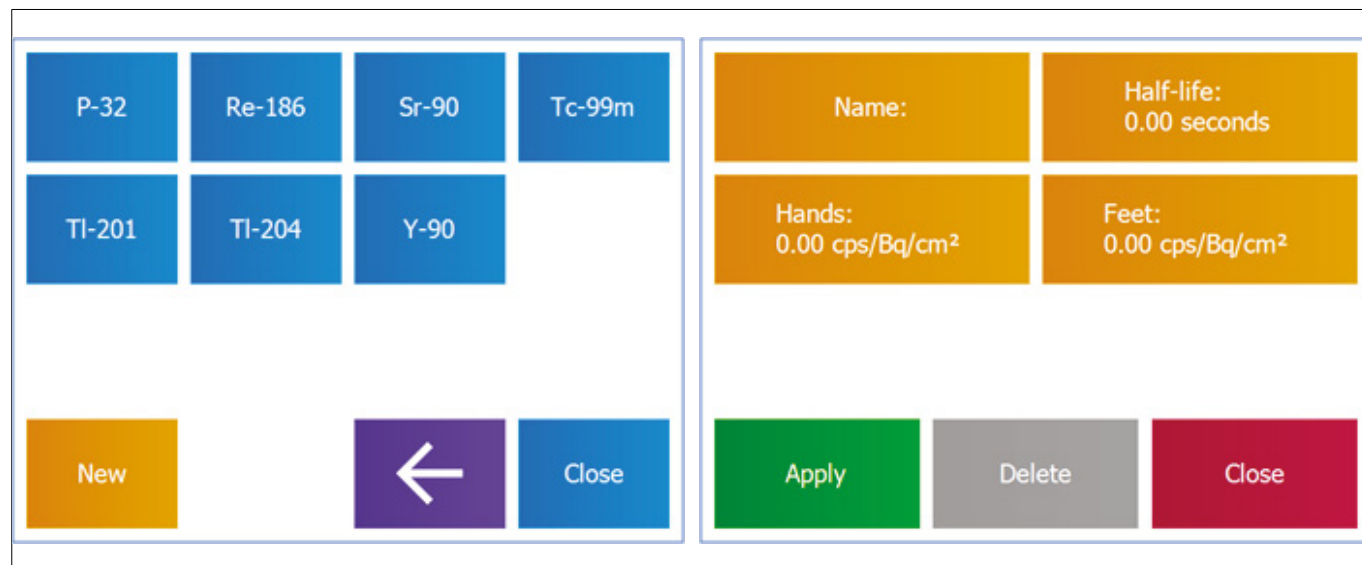


The figure shows a single screenshot of a dialog box. At the top, there are two pink buttons. The left button has a circular arrow icon and the text 'Hands: On'. The right button has a circular arrow icon and the text 'Feet: On'. At the bottom right, there are two buttons: a green 'OK' button and a red 'Cancel' button.

Fig. 11 Screenshot for VLB-303-2 to disable detector

### 3.3.5 Set user-definable isotopes

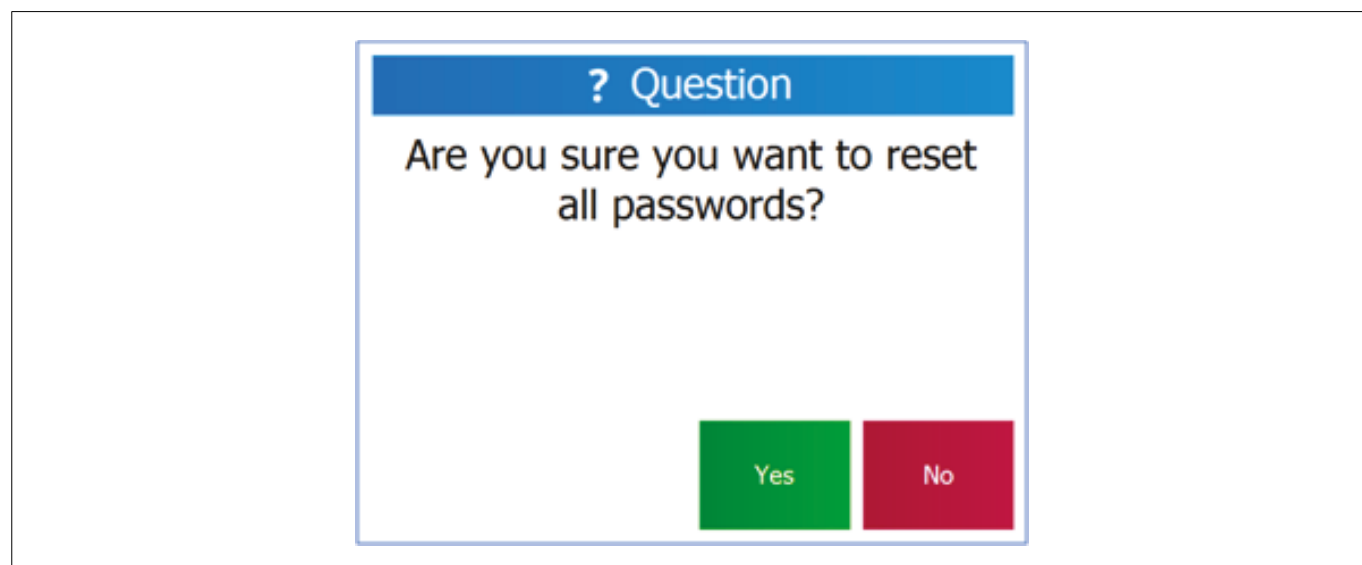
Each parameter is user-definable.



The figure shows two screenshots of the 'Set user-definable isotopes' interface. The left screenshot displays a grid of isotope buttons: P-32, Re-186, Sr-90, Tc-99m, Tl-201, Tl-204, and Y-90. Below the grid are buttons for 'New', a back arrow, and 'Close'. The right screenshot shows the configuration fields for a selected isotope. It includes 'Name:' and 'Half-life: 0.00 seconds' in the top row, and 'Hands: 0.00 cps/Bq/cm²' and 'Feet: 0.00 cps/Bq/cm²' in the bottom row. At the bottom of this screen are buttons for 'Apply', 'Delete', and 'Close'.

Fig. 12 Sequence of screenshots to set a new isotope

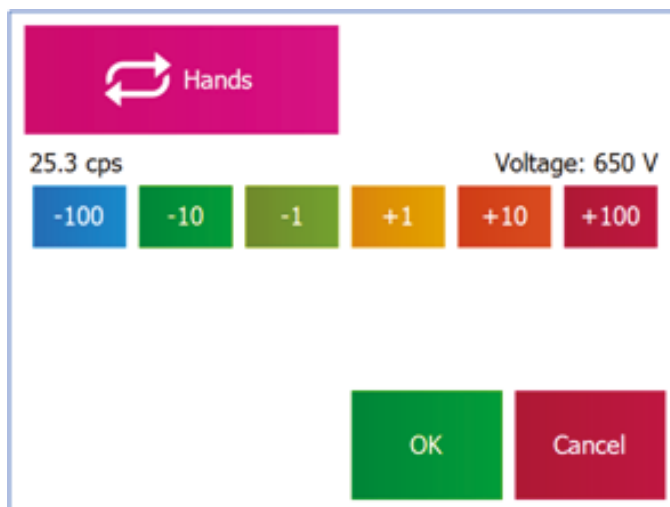
### 3.3.6 Reset passwords



The figure shows a confirmation dialog box titled '? Question'. The text inside the dialog asks: 'Are you sure you want to reset all passwords?'. At the bottom right of the dialog are two buttons: 'Yes' (green) and 'No' (red).

### 3.3.7 Calibrate the system

Calibration is done with a test source at a defined distance from the detector and adjusting the voltage in accordance with known value.



### **4.1 VERA 303 SOFTWARE**

VERA 303 SOFTWARE is an easy-to-use data management software. Is designed to manage VLB-303-X measurements for single users or for a group of users (a department, for example) at one time. VERA 303 Software and Database are stored in a PC connected to the VLB-303-X with an Ethernet connection. This PC manages all the VLB data.

To work with VERA 303, a RFID reader is mounted on the display of the VLB. Every user (or every group) has a dedicated badge to access the VLB. To start the measurement the user should pass his badge in front of the RFID reader: the system recognizes the user, starts the measurements and stores the data.

It is possible to create temporary access for visitors. Those data will be also stored in the VERA Database.

With VERA 303 is possible to create reports for risk analysis. Standard reports are:

- All users in a certain period of time. Alarms and measurements are summarized for each user.
- All the measurements for a specific user in a certain period of time. All measurements are shown.

### **4.2 COLLIMATOR PROTECTION FOIL**

This special protection foil can be applied on the feet detectors to protect the detectors from the ingress of dirt.

## 5 TECHNICAL DATA

	<b>VLB-303-2</b>	<b>VLB-303-4</b>
Number of channels	2, up to 10000 cps.	4, up to 10000 cps.
Hand detector	Plastic scintillator, 240 cm <sup>2</sup> , sensitive on both sides.	2 x Plastic scintillator, 240 cm <sup>2</sup>
Foot detector	Plastic scintillator, 1050 cm <sup>2</sup>	2 x Plastic scintillator, 525 cm <sup>2</sup>
Clothing detector	The hand detector functions as clothing detector when lifted from the VLB-303.	The right hand detector functions as clothing detector when lifted from the VLB-304.
User interface	5.7" LCD, 640 x 480 pixels color display with touch screen.	5.7" LCD, 640 x 480 pixels color display with touch screen.
Parameter setting	Secured with password.	Secured with password.
Interfaces	Ethernet 1 Gbps.	Ethernet 1 Gbps.
Temperature range	0 – 40 °C.	0 – 40 °C.
Relative humidity	Maximum 90%, non-condensing.	Maximum 90%, non-condensing.
Power supply	15 W, 84 -264 VAC, 47 – 63 Hz.	15 W, 84 -264 VAC, 47 – 63 Hz.
Measurement time	Adjustable between 1 and 99 seconds.	Adjustable between 1 and 99 seconds.
Background measurement	Moving average with adjustable time window (60 – 600 seconds)	Moving average with adjustable time window (60 – 600 seconds)
Background subtraction	Detector specific according to factors determined during a background calibration cycle.	Detector specific according to factors determined during a background calibration cycle.
Minimum alarm	Occurs when in a period of 10 seconds no pulses were received from one of the detectors.	Occurs when in a period of 10 seconds no pulses were received from one of the detectors.
Contamination alarm	Per detector adjustable between: \$1 – 9999 cps. \$0.1 – 999 Bq/cm <sup>2</sup> (default 4 Bq/cm[4:2]).	Per detector adjustable between: \$1 – 9999 cps. \$0.1 – 999 Bq/cm <sup>2</sup> (default 4 Bq/cm[4:2]).
Dimension	345 x 800 x 1230 mm (w x d x h)	410 x 800 x 1230 mm (w x d x h)
Weight	32 kg	35 kg

## 5.1 OVERALL DIMENSIONS

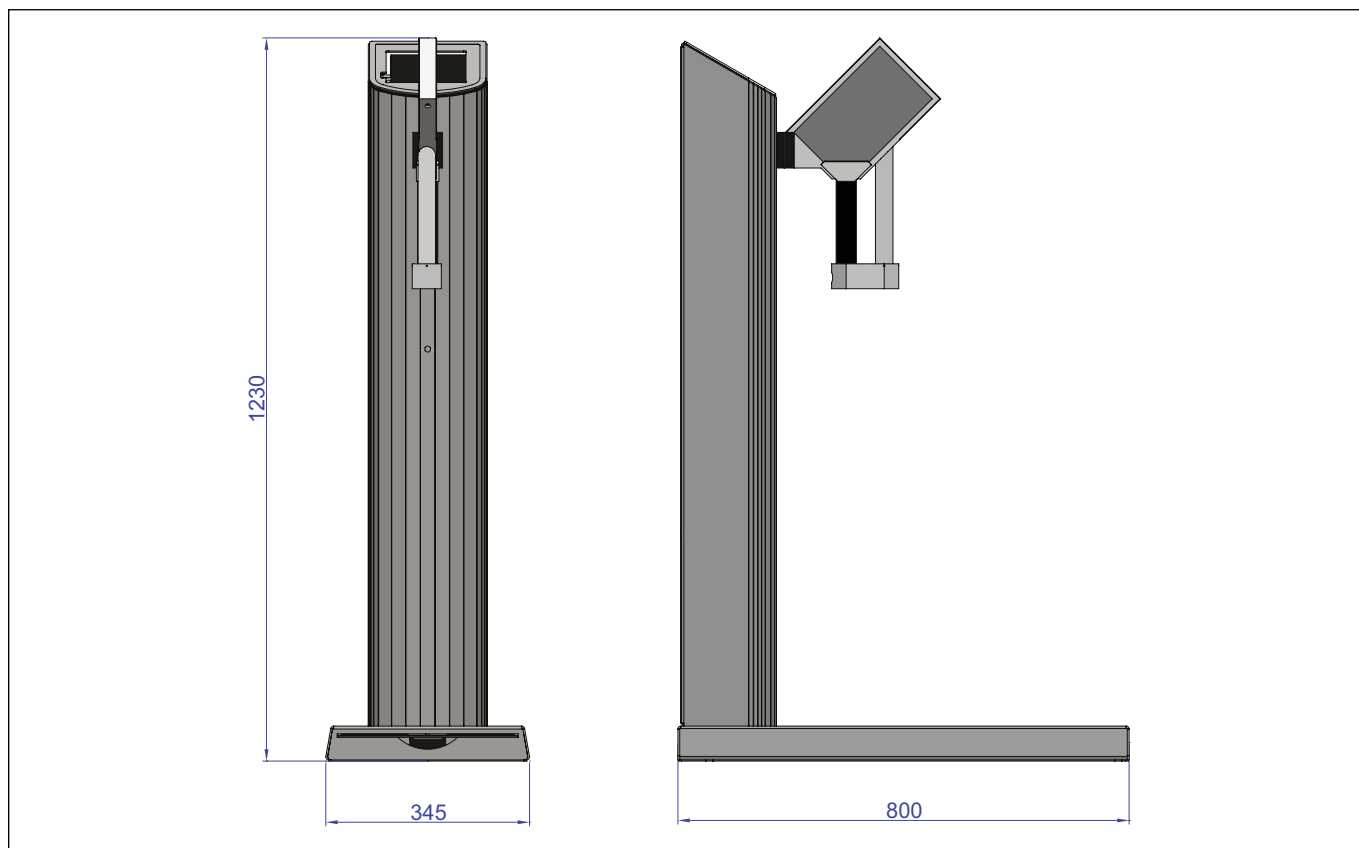


Fig. 13 VLB-303-2

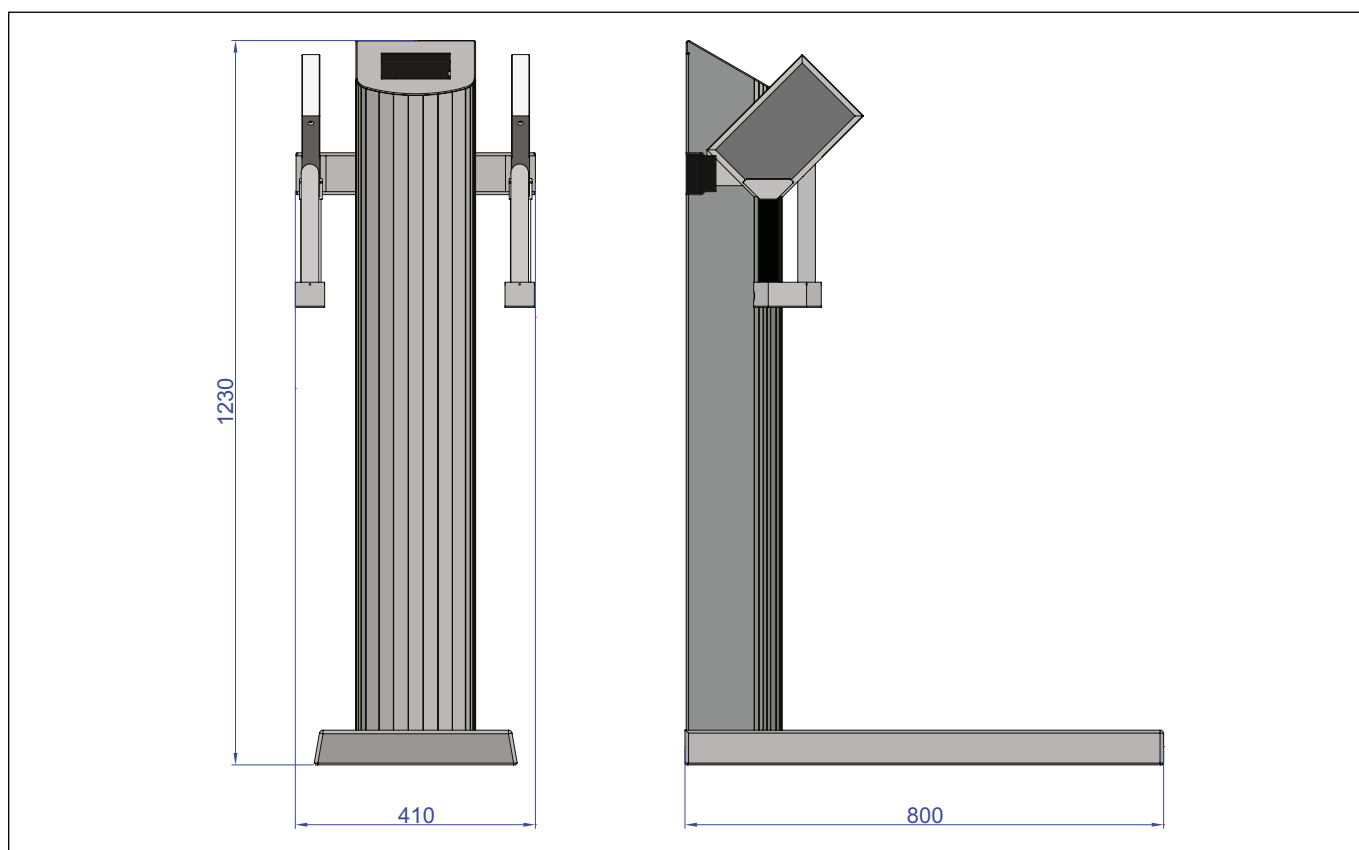


Fig. 14 VLB-303-4

## 6

## AFTER-SALES SERVICE

### 6.1 MAINTENANCE SERVICES

The system needs periodical check and cleaning.

The periodical check is suggested at least every year, using a check source and comparing this with the expected value.

General cleaning of the unit is carried out using a wetted cloth. Thoroughly cleaning can be done using stainless steel polish/oil (buy separately). The foot detector protector plate can be removed for cleaning purposes. This can be done through the slot in the front of the floor stand.

Contamination's can be removed fast by using Collimator Protector foil over the detectors (optional). This foil protects the foot detector from ingress of dirt.

### 6.2 REMOTE ASSISTANCE / HELP DESK

The service allows connecting to the Comecer computer to access directly all machine functions and verify their proper operation.

Maintenance Contracts offer

Standard: preventive maintenance + ON CALL (secured lead time).

Full Risk: preventive maintenance + ON CALL (secured lead time) + Spare parts.

### 6.3 TRAINING & CONSULTING

Additional training for users.

Level 1 maintenance training.

Helping the customer to find the best solution ensuring that both operational and economical needs are optimally met.

### 6.4 UPGRADE & RETROFIT

We propose constant updates on the equipment to increase durability and reliability both in terms of operational safety.

### 6.5 SPARE PARTS

Critical Spare Parts always available

Comecer warehouse.

Stock of parts as close to customers as possible using service providers warehouses.

### 6.6 SERVICE AS A CONTINUOUS SUPPORT TO CUSTOMERS

From the SAT (Site Acceptance Test), Comecer Service takes care of its customers for the entire duration life of the equipment, by supporting them either during the normal processing or maintenance operations or for extraordinary service.

## **6.7 IMMEDIATE RESPONSE TO THE REQUESTS OF THE CUSTOMER.**

Our service engineering office handles over 1,000 worldwide technical support requests a year, either via telephone or on-line.

Presence in the field

Comecer Field Engineers and authorized local Service Providers authorized and certified, manage over 1,500 interventions a year, at the customer premises in short time, with high professionalism and expertise level in order to ensure top equipment efficiency.

## **6.8 PLANNING**

Our planning office ensures an optimized service planning, by assigning priority levels, according to the customer's requirements.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



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