Operating Instructions

Control Unit

PRIMUS+

We reserve the right to change the contents due to product innovation or technical improvement.

Please state type of equipment and serial number when contacting us.

Please read these instructions and keep the manual safe!

Please observe and follow the safety notes!

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1 General information

1.1 Introduction

The texts and illustrations in this instruction manual are for the exclusive purpose of explaining how to operate and handle the control unit. The manufacturer accepts no responsibility for damage resulting from the use or misuse of this equipment. All appropriate safety rules and regulations for the use of this equipment must be adhered to. If you have any questions with regard to the installation and operation of this equipment please do not hesitate to contact us.
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1.2 Field of application

The PRIMUS+ control unit is used in combination with Sesotec metal detectors and separators in the plastics, wood, food, chemical, and in a special version also in the pharmaceutical industry. Depending on the respective version, these systems inspect packed, unpacked, or piece products, and bulk materials for magnetic and non-magnetic metal contaminations.
Of course they also are suitable for similar applications in other branches of industry.

1.3 Application reasons

- Product liability
- ISO 9000
- TQM (Total Quality Management)
- Protection of machines and quality assurance

1.4 System identification

The information in this instruction manual only applies to the PRIMUS+ control unit. A label with the respective data is attached at every system.

1.5 Symbols used

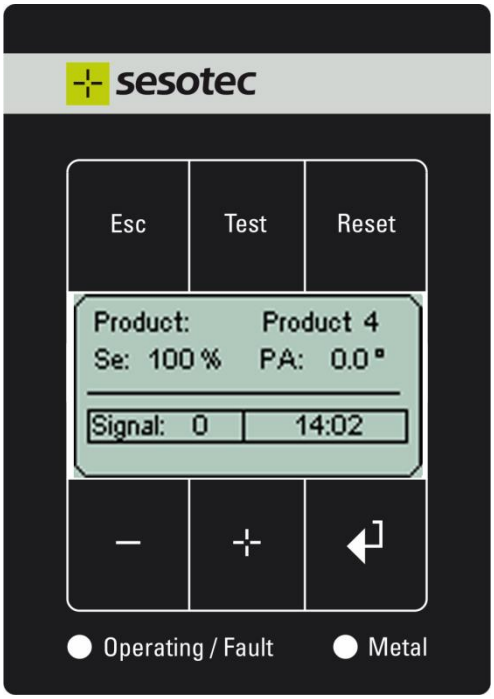
Symbol	Signal word	Meaning
	Danger	Warning: Possibility of severe or even fatal personal injuries.
	Danger	The lightning symbol is an explicit warning that there is danger from electric current.
	Warning	Warning: Possibility of minor personal injuries or property damage.
	Caution	Warning: Possibility of defects or destruction of the equipment.
	Important information	Indicates an important information for the function.
	Important hint	Indicates an important hint for the function.

1.6 EC DECLARATION OF CONFORMITY

(See annex – EC DECLARATION OF CONFORMITY)

1.7 Overview

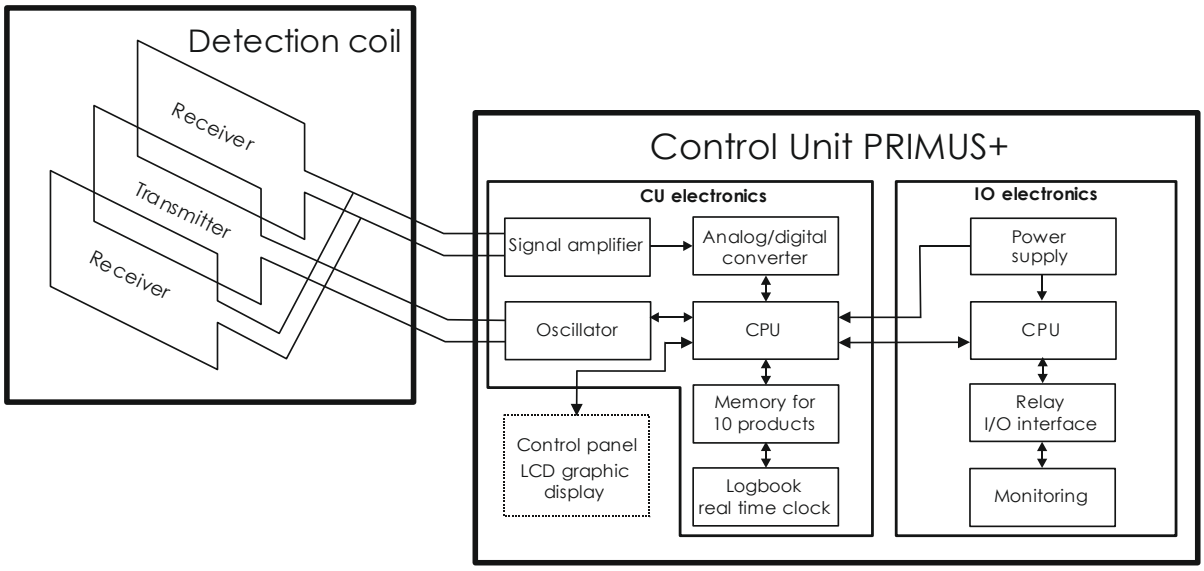
PRIMUS+ Control Unit



Graphic display

2 Design and method of operation

2.1 Functional principle



The metal detector works with the so-called "balanced coil" principle:
The transmitter winding in the search coil creates a high-frequency electromagnetic field, which is received by symmetrical placed receiver windings. The windings are connected against each other; when undisturbed, the system is in balance.

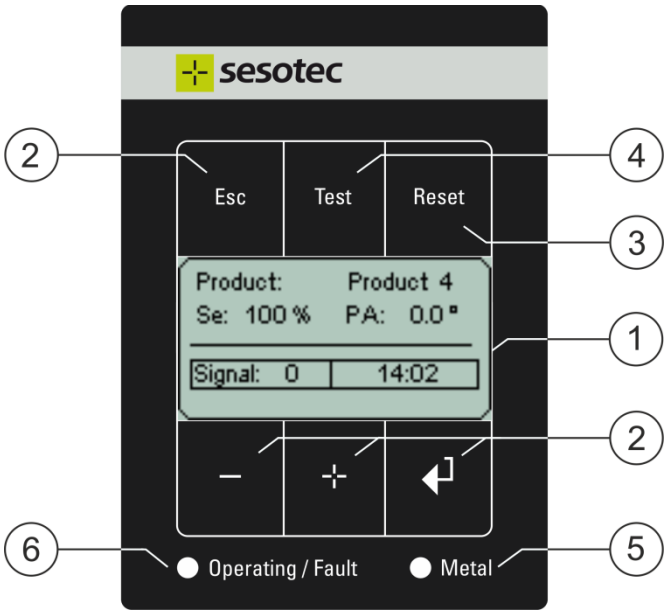
An electrically conductible object within the detection area disrupts this balance and the electronic creates a switch signal.
A "teach in process" allows to suppress the conductivity of the product itself. Deviations from the taught-in product are usually caused by metal contaminants, which are detected by the device with high precision.

The metal detector is equipped with comprehensive test and analysis software to ensure fault-free operation and retracing of product errors.

	For reasons of the employed technology it is not possible to guarantee 100% metal detection.

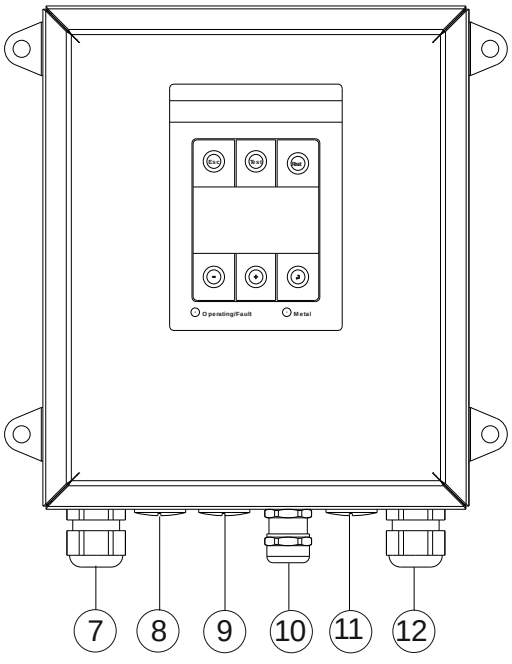
2.2 Functional and control elements

2.2.1 Operating module with LCD graphic display



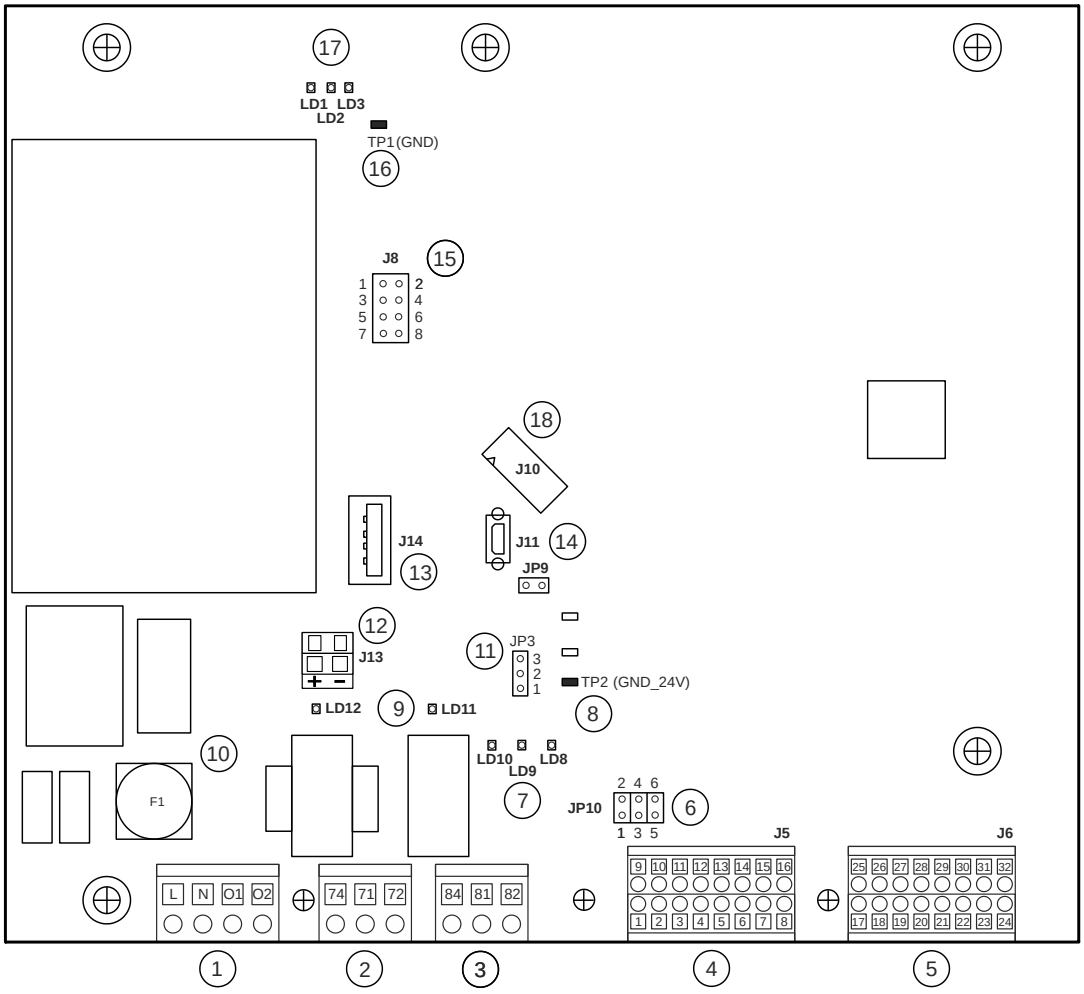
1	Graphic display	LCD module	Display of operating and input masks
2	Operator keys	+ , - , ↵ , Esc	For operation and machine setting
3	Function key	Reset	Reset to restore the unit after metal or fault signal
4	Function key	Test	Test function for metal detectors
5	Metal LED	Metal	Lights red when metal detected
6	Operating / Fault LED	Operating	Lights green in normal operating mode, metal detection active
6	Operating / Fault LED	Fault	Lights red in case of fault and error

2.2.2 Cable glands



(7) Cable gland for the mains cable
(8), (9), (11) Cable gland for option
(10) Cable gland for free use
(12) Cable gland for connecting the detector coil

2.2.3 PRIMUS+ / IO electronics board



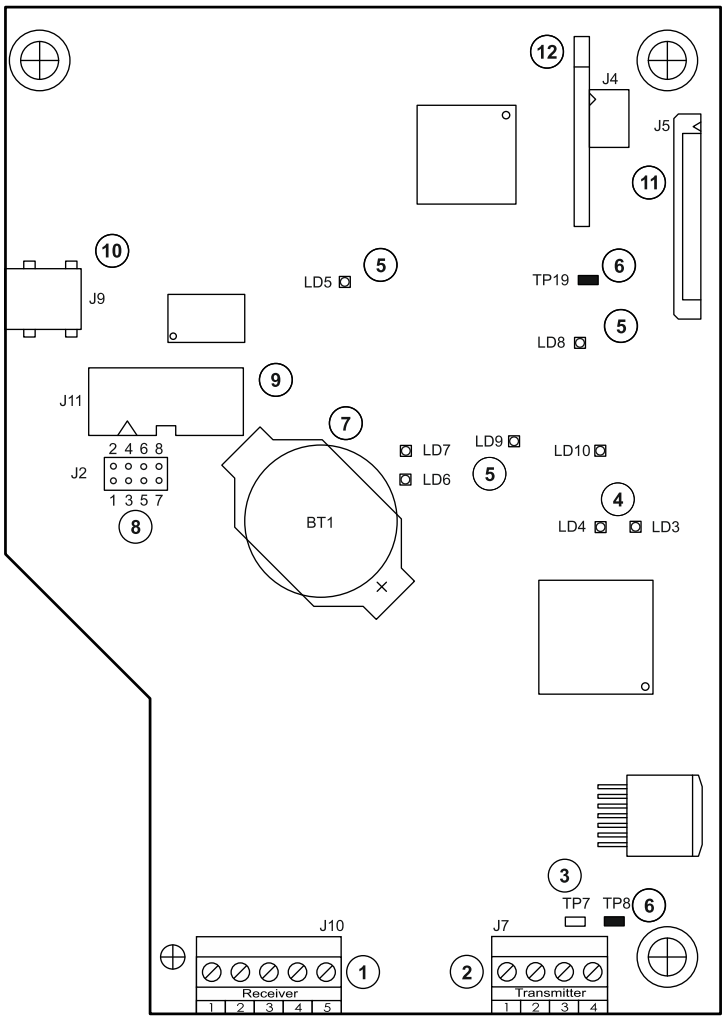
Connectors and terminals:	(1) "Mains/Option"	L/N: Control unit power supply O1/O2: Optional 24V module power supply
	(2) "Relay metal"	Potential free change over contact
	(3) "Relay fault"	Potential free change over contact
	(4) "Switching outputs"	J5, connector, magnetic valves, signal combi., etc.
	(5) "Switching inputs"	J6, connector, sensors, switches, etc.
	(12) "MV voltage external"	J13, connector 24V external (option)
	(18) "CU connection"	J10, plug connection to CU electronics
Elements connected to mains voltage:	(1) "Connector, Mains/Option" (10) "Mains fuses"	
Elements connected to external voltage:	(2) "Connector, relay metal" (3) "Connector, relay fault"	
Light diodes:	(7) "Monitor LED, MV1-3"	LD 10, magnetic valve (MV1) LD 9, magnetic valve (MV2) LD 8, magnetic valve (MV3)
	(9) "Monitor LED, relay"	LD 11, relay fault (84, 81, 82) LD 12, relay metal (74, 71, 72)

	(17) "Monitor LED, Vcc"	LD 1, +24V
		LD 2, +10V
		LD 3, +3.3V

Jumper:	(6) "MV connection monitor"	JP10, 1-2, MV1 JP10, 3-4, MV2 JP10, 5-6, MV3
	(11) "MV voltage supply"	JP3, 2-1 external 24V (connector J13 +/-) JP3, 2-3 internal, 24V (default)
	(15) "Service jumper"	J8, 5-6, plugged, enable, program update
Test points:	(8) "GND_24V"	TP2, magnetic valves (MV1- MV3)
	(16) "GND"	TP1, IO electronics
Interface/plug connectors:	(14) "Program update"	J11, mini USB, (only for trained staff) JP9, USB selection (jumper plugged)
	(13) "Data backup"	J14, USB interface (system / product data) JP9, USB selection (jumper open)

Fuse	**Description**	**Type**
F1	Mains supply	1.6A slow-blowing 1500A @ 250VAC 5x20mm

2.2.4 PRIMUS+ / CU electronics board



Connectors and terminals:	(1)	"Receiver"	J10, input signal from the detection coil
	(2)	"Transmitter"	J7, output signal to the detection coil
	(9)	"Service interface"	J11, diagnostics interface
	(11)	"FFC connector"	J5, ribbon cable connector to the display module
	(12)	"Memory"	J4, system / product data
Test points:	(3)	"Transmitter signal"	TP7, sine signal (25Vss) to the detection coil
	(6)	"GND"	TP8, TP19, reference ground for all signals
Jumper:	(8)	"Service jumper"	J2, 5-6, plugged, enable, program update
Interface/plug connectors:	(10)	"Program update"	J9, mini USB, (only for trained staff) (JP2, observe jumper position)

Light diodes:	(5)	"Monitor LED,s, Vcc"	LD 5, +24V
			LD 6, +5V
			LD 7, -5V
			LD 8, +15V
			LD 9, -15V
			LD 10, 3.3V

	(4)	"Monitor LED's"	LD 4, green, operating status LD 3, red, fault status
Memory:	(12)	"Memory devices"	J4, device and product data
	(7)	"Battery"	BT1, for real-time clock

3 Dimensions and technical data

3.1 Technical data sheet, see annex

3.2 Supply connections, see technical data sheet in the annex

3.3 Environmental conditions for operation, storage, and transport

The environment of the control unit should be free of any chemical vapours such as softeners, chlorine, or similar substances. The control unit must not be exposed to direct sunlight or to other environmental influences (rain, snow and storm). For ambient temperature conditions for operation, storage, and transport please refer to the technical data sheet in the annex.

3.4 Noise levels

Sound pressure level measurements (in acc. with DIN 45 635)

Peak value of sound pressure level at a distance of 1m from the machine surface and 1.60m above the floor, LpA, 1m, max.

Result:
Idling: < 70 dB(A)
Activated: < 90 dB(A)

We reserve the right to change the contents due to product innovation or technical improvement.

4 Safety

Our equipment conforms to all official technical safety regulations. However, as a manufacturer we believe it is our duty to make you aware of the following information.

The following safety and danger notes are intended for your protection, for the protection of third parties, and for the protection of the equipment. The safety notes therefore should always be observed!	

4.1 Intended use

The equipment is intended for use in the following fields of application and only in combination with a corresponding detection coil of series GLS, C-SCAN DLS, P-SCAN RP: Suction/pressure conveyor applications, free-fall applications, and applications at a conveyor belt. The equipment can be used in the plastics, food, animal feed, recycling, and chemical industry. Basically it is possible to also use the system in other applications than the intended use stated herein, but such applications always require the prior consultation and approval of Sesotec GmbH.	

4.2 Safety signs

Symbol	Signal word	Location	Meaning
	Mains voltage	Cover of the electronics housing	This symbol indicates that mains voltage is used in the electronics housing, and that any connected external circuits (e.g. at the metal relay) also may be energised. There is danger of electric shocks due to the presence of mains voltage. Connection symbols: "Mains" (1) "Metal" (2) und "Fault" (3)

4.3 Dangers arising from non-compliance with safety notes

Any non-observance of safety notes constitutes a danger for life and health.	

4.4 Safety information for operators

The control unit PRIMUS+ may only be operated in the intended purpose and in a perfect functioning condition, especially the cover of the electronic housing has to be closed during operation. Entered moisture has to be removed! All fixed warning signs on the equipment may not be removed and have to be in a well recognizable condition. The operating instructions always have to be in a legible condition and complete available. Prior to commissioning always make sure that the applicable accident prevention regulations are observed. If the control unit is not mounted at the detection coil, it must be properly and firmly fastened by means of the four screws. The operator must make sure that the equipment is mounted at an ergonomic height for operation. The operator may only appoint qualified personnel for operation, maintenance and repair work. If potentially explosive materials are examined, the pertinent regulations must be observed.	
Emitted interference Test report according to the provisions of: BGV B11:2001-06 — Regulations of the professional association for safety and health at work. Accident prevention regulations for electromagnetic fields. E DIN VDE 0848-3-1: 05-2002 — Safety in electrical, magnetic, and electromagnetic fields, part 3-1: Protection of persons with active implants in the frequency range of 0Hz to 300 GHz.	
In the area where the operating personnel is working the electromagnetic field of the metal	

detector or separator does not exceed the limits stated in the provisions. Therefore there are no health impairments due to electromagnetic fields in this area for persons and for wearers of medical implants such as cardiac pacemakers. Inside the coil of round or closed tunnel coils, or on the surface of flat coils, the limits may be exceeded depending on design and system version. If work is to be performed inside or at the search coil, persons and wearers of medical implants such as cardiac pacemakers may only enter the equipment when it is turned off, provided that size and design allow this.	

4.5 Safety information for operation, maintenance and cleaning

Because of energised components in the electronics housing there is a risk of injuries due to electric shock or burns. During operation the cover of the electronics housing must be kept closed. Only qualified personnel may operate and clean the equipment.	
If the electronics housing must be opened for maintenance or cleaning purposes, remove any dirt and moisture from the electronics housing, so that no larger amounts may get into the interior. Always disconnect the power supply and any connected external circuits before opening the cover. Any moisture that has penetrated into the interior must be removed from the electronics housing. If any maintenance work must be performed in energised condition, e.g. battery replacement, such work may only be performed by a qualified electrician under strict observation of the attached warning labels and with due regard to standard approved rules of electrical engineering.	
No safe condition is established when outputs are switched "inactive" (with "Disable Outputs", "Bypass", or "Output level inactive". For any maintenance work the compressed-air and power supply of the machine must always be disconnected, and any existing pneumatic cylinders must be vented.	

4.6 Safety information for commissioning

To avoid any injuries due to energised parts in the electronics housing, the information in 5.1 and 5.2 must always be observed.	

4.7 Safety information for storage and transport

Always observe the information in paragraph 10 to avoid any transport damage and personal injuries.	

4.8 Notes on residual risks

Electrical circuits may still be live even after having been isolated from the mains. Switch off immediately if a fault occurs.	

4.9 Notes on stable standing requirements

To avoid any loss of stable standing, the information for transport, commissioning and operation must always be observed. Always make sure that the fastening screws of the control unit are tight during operation. When storing or transporting the control unit, place it on the closed rear panel of the housing.	

4.10 Consequences of unauthorised modification

Unauthorised modification or repair will invalidate all manufacturer declarations and guarantees.	

4.11 Improper use

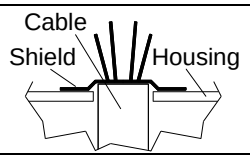
For other applications as enumerated in 4.1 the control unit PRIMUS+ intended for – that is regarded as inadmissible operation. Improper use also includes operating the equipment with excessive mechanical, static or dynamic loads (e.g. heavy machine parts or strong vibration). It is furthermore not permitted to inspect any aggressive materials on the conveyor, such as materials containing lyes, acids, and solvents, or materials that react to electromagnetic fields, or living persons or animals, and to operate the system in an Ex protection area.	

5 Commissioning

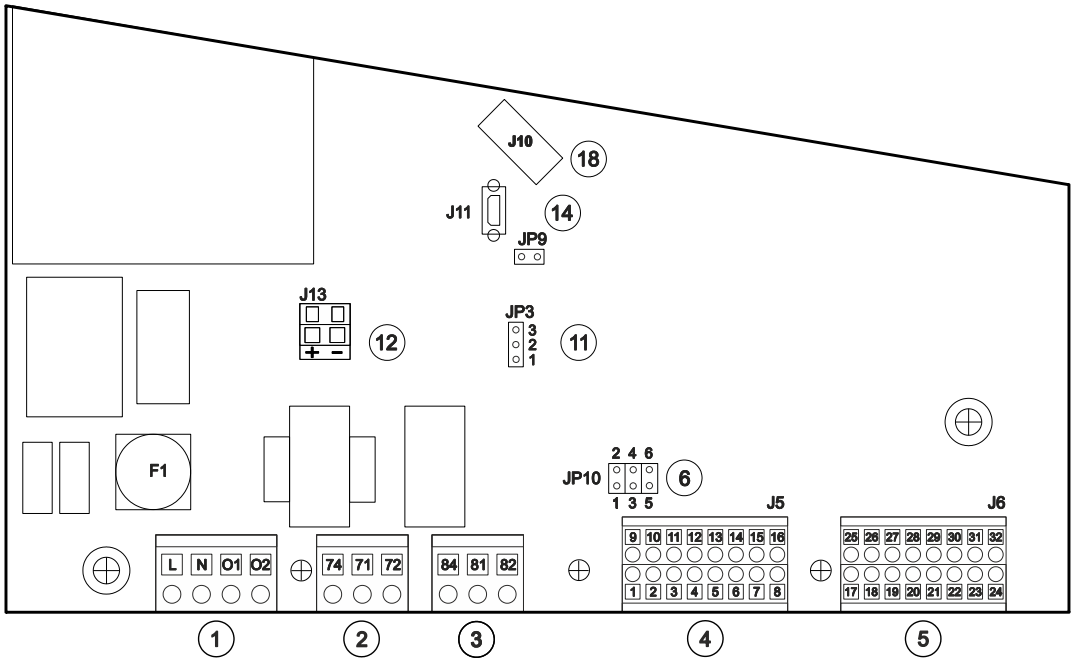
5.1 Mechanical mounting

- Ensure stable and non-vibrating installation! In house mounting and operation. Do not install the system in an explosion proof zone.
- Do not install the detection coil and the electronic unit in the vicinity of interference fields (large electric motors and frequency converters!) The distance depends on the power consumption of the motor or of the frequency converter (value for orientation: 5 m).
- Mount the control cabinet by using the provided bores. I.e. at a wall or frame (dimensions are shown in the outline drawings). Pay attention to good stability, as the weight of the control unit is approx. 4 kg.
- Never install the electronic unit in other switchgear cabinets, because this may lead to interference effects. (E.g. from contactor controls)!
- Cable lengths may only be modified after consultation with "Sesotec". Use only original cables. Lay the connecting cable in fixed installation apart from other cables (e.g. fix it with nailing clips or lay it in a cable duct).
- If several metal detector systems are used, the distance of the detection coils must not be less than 2m, if these coils stand side by side. If the coils are arranged opposite to each other, the distance must not be less than 10 m. These values apply to large systems; for smaller systems the distances may be reduced to 50 cm. If, for reasons of space, these distances cannot be observed, please contact Sesotec service!
- Do not install the equipment in such a way that operation of the mains cut-off switch is hindered in any way!

5.2 Connection of the equipment

	In order to meet CE conformity all cable outside of the housing has to be shielded. The shields must be grounded immediately after the cable gland.	

5.2.1 PRIMUS+ / IO electronics board (control electronics board)



5.2.2 Electrical connections

Pos.	Connection	Type of connection	Function
(1)	**"Mains/Option"**	Connector for mains supply	L/N: Electronics power supply O1/O2: Optional 24V module power supply connector
(2)	**"Relay metal"**	Voltage free relay contact	Normal operation: Contacts 71 and 72 closed On metal detected Contacts 71 and 74 closed
(3)	**"Relay fault"**	Voltage free relay contact	Normal operation: Contacts 81 and 84 closed In case of fault: Contacts 81 and 82 closed
(4)	**"Outputs"**	Switching outputs 24V	

J5

9	10	11	12	13	14	15	16
GND	LM	LB	LF	Mz	GND	GND	GND
FU	24V	24V	24V	24V	MV1	MV2	MV3
1	2	3	4	5	6	7	8

J5	Switching functions MV = magnetic valve connection (↓ =24V to GND or ↑ = 0V to 24V)
1 – 9	↑, FU: Not assigned
2 – **10**	↓, LM: Lamp metal
3 – **11**	↓, LB: Lamp operation
4 – **12**	↓, LF: Lamp fault
5 – **13**	↓, Mz: Ext. metal counter
6 – 14	↓ or ↑, MV1, (after system setup)
7 – 15	↓ or ↑, MV2, (after system setup)
8 – 16	↓ or ↑, MV3, (after system setup)

(5)	**"Inputs"**	Switching inputs 24V

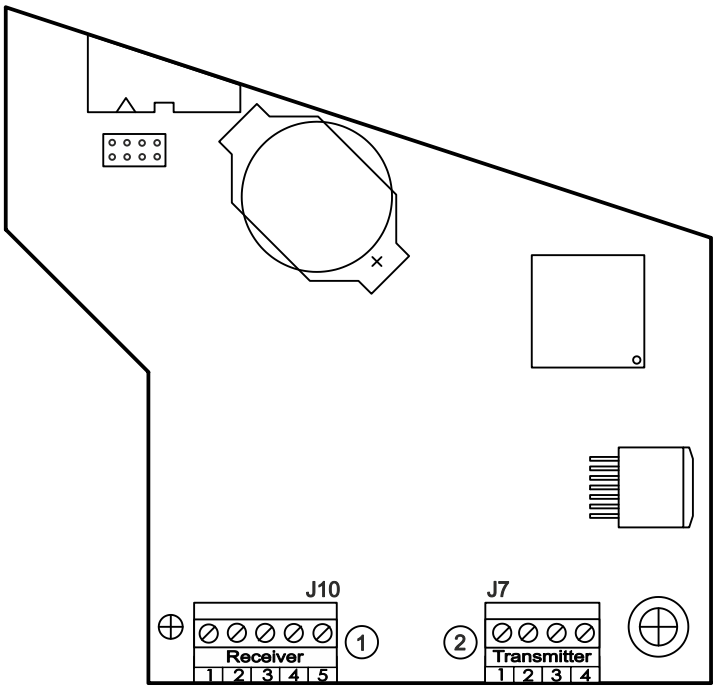
J6

25	26	27	28	29	30	31	32
GND	FEX	GND	DÜ	TEX	REX	MAN	MD
24V	KÜ	24V	24V	24V	24V	24V	24V
17	18	19	20	21	22	23	24

J6	Switching functions 24V, NPN or PNP switching
17 – **18** – 25	KÜ: Flap monitoring PNP or NPN (dep. on application)
19 – **26** – 27	FEX: Fault external PNP or NPN (dep. on application)
20 – **28**	DÜ: Compressed-air monitoring NPN
21 – **29**	TEX: Test external NPN
22 – **30**	REX: Reset external NPN
23 – **31**	MAN: Manual separation NPN
24 – **32**	MD: Deactivate metal detection NPN

<table>
<tr><th>Pos.</th><th>Connection</th><th>Type of connection</th><th>Function</th></tr>
<tr><td>(6)</td><td>"Jumper JP10"</td><td>Placement, connection monitoring MV1 – MV3 active / inactive</td><td>
<table>
<tr><th>JP10</th><th>Functions
Jumper plugged, monitoring inactive
Jumper open, monitoring active</th></tr>
<tr><td>1 – 2</td><td>MV1 connection monitoring</td></tr>
<tr><td>3 – 4</td><td>MV2 connection monitoring</td></tr>
<tr><td>5 – 6</td><td>MV3 connection monitoring</td></tr>
</table>
Remove jumper when valve is connected</td></tr>
<tr><td>(12)</td><td>"+24V external"</td><td>+24V, external supply of magnet valve connection</td><td>Supply MV1 / MV2 / MV3 with external 24V.
Necessary when high-power valves are used, if total valve power >6W
<table>
<tr><th>JP3</th><th>Function
Selection, supply of magnet valve connection</th></tr>
<tr><td>2 – 3</td><td>MV supply 24V internal</td></tr>
<tr><td>2 – 1</td><td>MV supply 24V external through connector J13</td></tr>
</table></td></tr>
</table>

5.2.3 PRIMUS+ / CU electronics board (evaluation electronics board)



<table>
<tr><th>Pos.</th><th>Connection</th><th>Type of connection</th><th>Function</th></tr>
<tr><td>(1)</td><td>"Receiver"</td><td>Connection for detection coil: Receiver</td><td>
<table>
<tr><th>JP10</th><th>Functions</th></tr>
<tr><td>1</td><td>Receiver signal</td></tr>
<tr><td>2</td><td>Receiver signal</td></tr>
<tr><td>3</td><td>Reference ground for receiver signal</td></tr>
<tr><td>4</td><td>- 5V</td></tr>
<tr><td>5</td><td>+ 5V</td></tr>
</table></td></tr>
<tr><td>(2)</td><td>"Transmitter"</td><td>Connection for detection coil: Transmitter</td><td>
<table>
<tr><th>JP7</th><th>Functions</th></tr>
<tr><td>1</td><td>Transmitter voltage</td></tr>
<tr><td>2</td><td>Reference ground for transmitter voltage</td></tr>
<tr><td>3</td><td>Not assigned</td></tr>
<tr><td>4</td><td>Transmitter switch-over signal</td></tr>
</table></td></tr>
</table>

5.2.4 Electrical performance

Potential-free relay contacts	250V 3A with alternating voltage 120V 3A with direct voltage

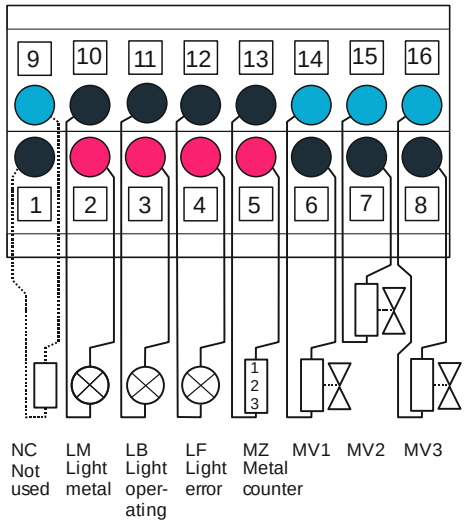
	For the potential-free relay circuits fusing must be provided outside the equipment.

Switching outputs (MV1, MV2, MV3) **Switching outputs (LM, LB, LF, Mz)**	Maximum current load: 250 mA Maximum current load: 150 mA
Switching inputs	Connection of make contacts against+24 V, connection of sensors (PNP, NPN) total max. permissible current load 24V / 150 mA

5.2.5 Drawing of input / output connections

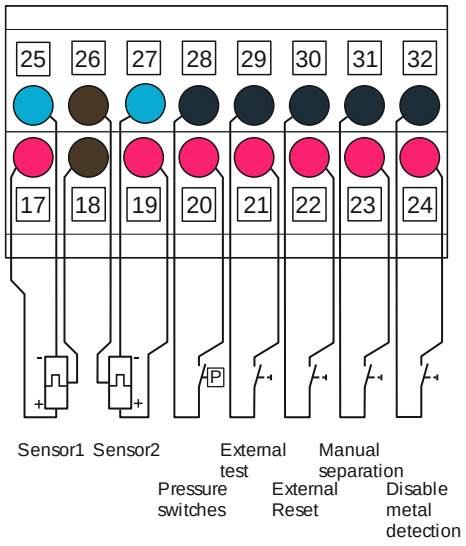
Switching outputs

J5



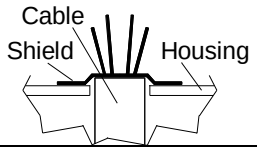
Switching inputs

J6

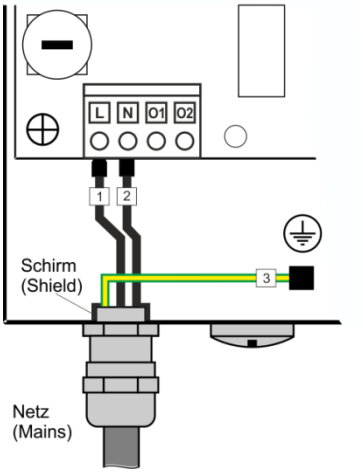


	At J5, J6 only circuits that are isolated from the mains supply by way of double insulation (SELV circuits) may be connected.

5.2.6 Electrical connection of the equipment

	Maximum cable length for external components, **switches** and **sensors** is 15 m. Only shielded cables should be used. The shields must be attached directly to the electronics housing.	

Mains supply via control electronics board



1	Conductor 1 (black)	to terminal L
2	Conductor 2 (black)	to terminal N
3	Conductor PE (yellow/green)	to earth connection

5.2.6.1 Mains supply via safety socket

1. Connect the cable with mains plug to an existing socket.
2. After approximately 5 seconds the machine is ready for operation.

5.2.6.2 Mains supply via terminal box

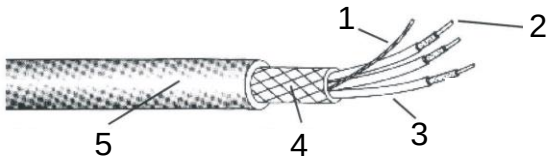
	The following procedures should only be undertaken by qualified personnel. Before removing cover plates etc. make sure the equipment is isolated from mains or external voltage.

	If the mains plug is removed, a terminal box and a suitable mains disconnector switch with corresponding labelling/marking must be installed! This disconnector switch must be easily accessible and must disconnect all poles from the mains.

	If mains supply connection is effected by way of a terminal box, external fusing with 16A(T) must be provided outside the equipment.

1. Remove mains plug.
2. Strip 5 cm length of insulation from cable and 1 cm from leads and attach cable cores.

Mains cable

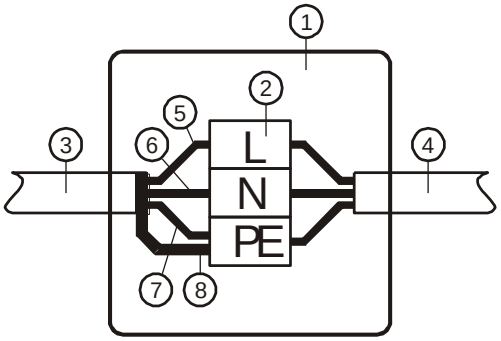


1	Shield
2	Conductor
3	PVC insulation
4	Isolation
5	PVC covering

3. Feed cable into connection box according to diagram below.

	Make sure that the mains supply is switched off.

	Use a suitable shutdown unit i.e. emergency switch.



1	Terminal box	
2	3 pin terminal	
3	Control unit mains cable	
4	Main supply	
5	Conductor 1 (black)	To terminal L
6	Conductor 2 (black)	To terminal N
7	Conductor PE (yellow/green)	To terminal PE
8	Shield	To terminal PE

4. Close the terminal box
5. The unit is ready for operation approximately 5 seconds after switching it on.

	IMPORTANT! Connect the shield to PE

Note:

The mains cable has a wire cross-section of 1.5 mm². The mains supply fuse protection should be set accordingly.
The electronic board contains no alternating mains fuse.

5.2.7 Behaviour of machine at start up

Lamps and outputs during start-up phase:

Output	Contact status with parameter "Metal at power on = [ ]"
LED Operation / Fault	"off"
LED Metal	"off"
Metal relay	Contacts 71 and 72 closed (equal to no metal alarm)
Fault relay	Contacts 81 and 82 closed (consistent with fault status)
MV1 / MV2 / MV3 switching outputs	High active or Low active, depending on system setup
Lamp interface	LM = Lamp metal "on" LB = Lamp operation "on" LF = Lamp fault "on" Mz = Metal counter "inactive"

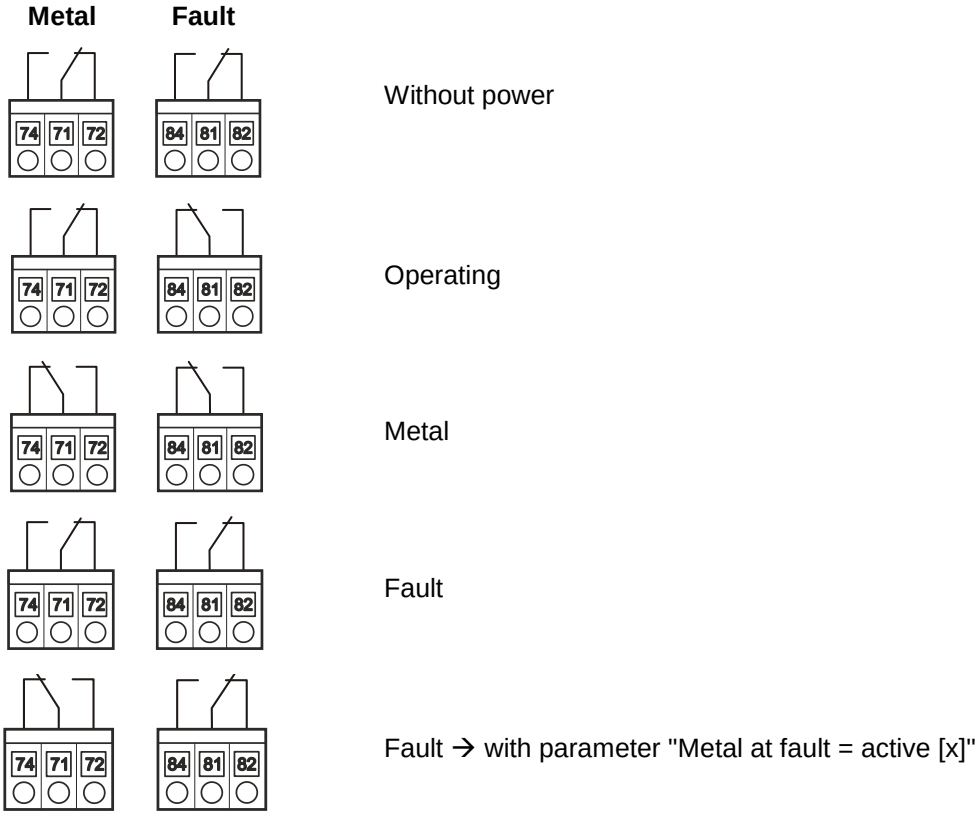
LM, LB and LF „on“ → Function test lamp in the start-up phase.

Output	Contact status with parameter "Metal at power on = [x]"
LED Operation / Fault	"off"
LED Metal	"on"
Metal relay	Contacts 71 and 72 closed (consistent with metal alarm)
Fault relay	Contacts 81 and 82 closed (consistent with fault status)
MV1 / MV2 / MV3 switching outputs	High active or Low active, depending on system setup
Lamp interface	LM = Lamp metal "on" LB = Lamp operation "on" LF = Lamp fault "on" Mz = Metal counter "inactive"

Lamps and outputs after start-up phase (approx. 5 seconds)

Output	Contact status
LED Operation / Fault	"on" green illuminates
LED Metal	"off"
Metal relay	Contacts 71 and 72 closed (equal to no metal alarm)
Fault relay	Contacts 81 and 84 closed (equal to no fault status)
MV1 / MV2 / MV3 switching outputs	High active or Low active, depending on system setup
Lamp interface	LM = Lamp metal "off" LB = Lamp operation "on" LF = Lamp fault "off" Mz = Metal counter "inactive"

5.2.8 Relays – operating status



6 Menu / Operation PRIMUS+

This chapter starts with a short manual and cross references in order to familiarise the reader with the most important settings. Following this, all setup menus are described.

6.1 General Operation

The control unit can be operated with 4 keys of the membrane keypad. These keys are used both for navigation in menu selections and for setting parameters.

Key	Function	Comment / Example
	Several functions	Menu selection → down
		Parameter → decrease the value
	Several functions	Menu selection → up
		Parameter → increase the value
	Several functions	Back to the next highest menu level
		Exit parameter settings without any changes
	Several functions Confirm / Accept / Select function	Menu selection → confirm
		Parameter → accept
	Select individual menu items by pressing the key	☐ Function 1 ☐ Function 2 Reset mode Autom.
	☑ Activate a function	Displayed function → activate
	☐ Deactivate a function	Displayed function → deactivate
	Function key	Activates the separation process at metal separators
	Function key	Resets a metal message Resets a fault message

6.2 Quick Start

6.2.1 Language Selection

(If required)

1. Turn on device, operating mask is displayed.
2. Press the key.
3. Press the key until you reach the end of the menu list ("Setup" menu item) and confirm this with the key.
4. Press the key until you reach the menu item that is marked with *) (Language*) and confirm this with the key.
5. Use the or keys to select the desired language and again confirm your selection with the key.

Please note:
For the PRIMUS+ control unit there are two language versions with the following languages.

Language version 1

- German
- English
- French
- Italian
- Spanish
- Dutch
- Japanese
- Czech
- Russian
- Greek
- Swedish
- Turkish
- Polish
- Hungarian

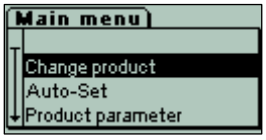
Language version 2

- English
- Chinese traditional
- Chinese simplified
- Korean
- (Japanese will still be added in this language version)

6.3 Menu Structure

Overview of menu items and setting masks, starting from the main menu.

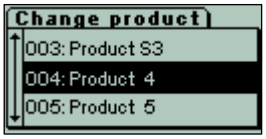
6.3.1 Main menu



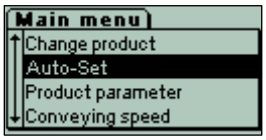
Menu items:

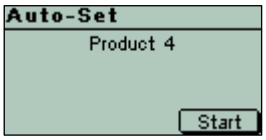
- Change product
- Auto-Set
- Product parameter
- Output
- Conveying speed
- Setup

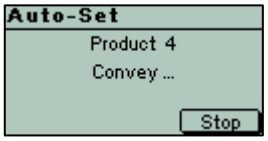
6.3.2 Function menu items

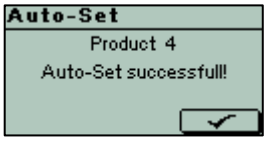


Product selection:
001: to 010:

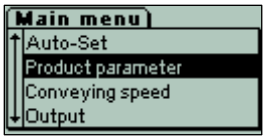


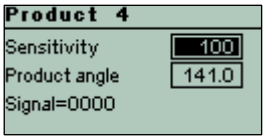


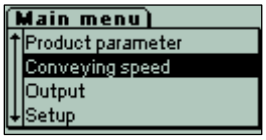


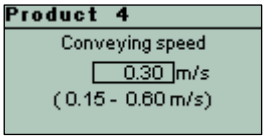


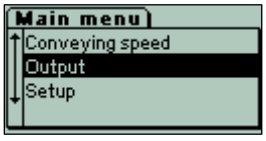
6.3.3 Settings menu items

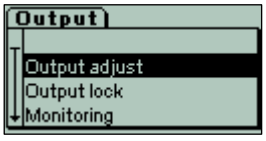






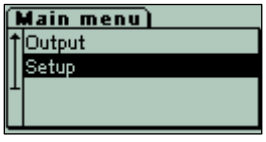


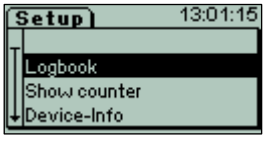




Output menu

- Output adjust
- Output lock
- Monitoring
- Output level
- Output options

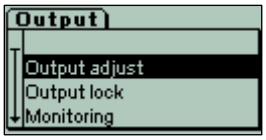


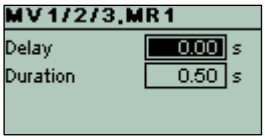


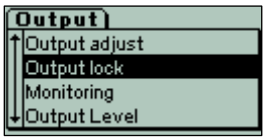
Setup menu

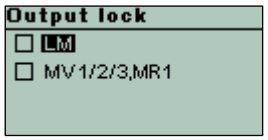
- Logbook
- Show counter
- Device-Info
- Revision
- Language*)
- Login
- Logout

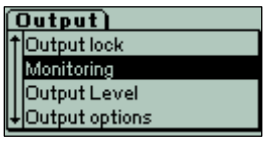
6.3.4 Output menu

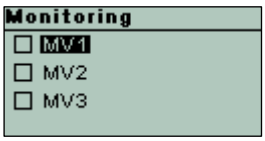


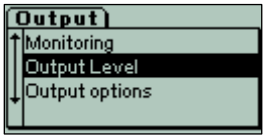


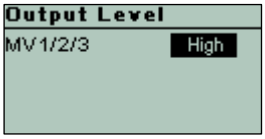


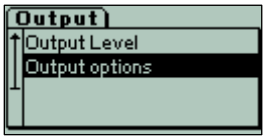


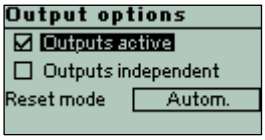


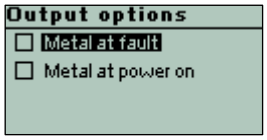












6.3.5 Setup menu

Setup levels

There are currently **three** setup levels.

Level 0 -> "Setup level standard" without "Code-No."
The following options are available:

- Logbook
- Show counter
- Device-Info
- Revision
- Language*)
- Login
- Logout

Level 1 -> "Setup level" with code "1000"
The following options are available:

- Logbook
- Clear logbook [1000])
- Show counter
- Device-Info
- Revision
- Change password [1000])
- Language*)
- Clock/Date [1000])
- Setup options [1000])
- Units [1000])
- Frequency deviation [1000])
- Factory settings [1000])
- Login
- Logout

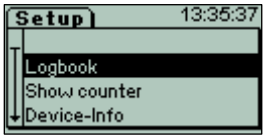
[1000]) Additional menu items with login 1000

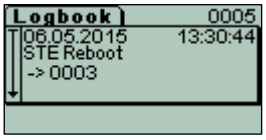
Level 2 -> Setup level" with code "2000" (IO level)
The following options are available:

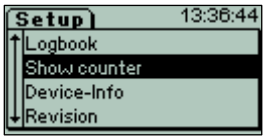
- Logbook
- Clear logbook
- Show counter
- Device-Info
- Revision
- Language*)
- Air pressure monitoring [2000])
- Flap monitoring or "Initiator" or "Light barrier" [2000])
- External error or "Eject/filling level" or "Eject" or "Filling level" or "Clip detector" [2000])
- Setup options
- Login
- Logout

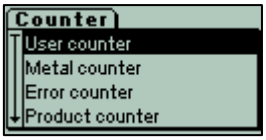
[2000]) Additional menu items with login 2000 and depending on the set and activated options in the Service menu (factory settings, device and system specific).

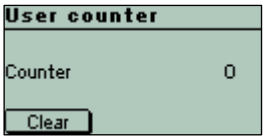
Overview 1

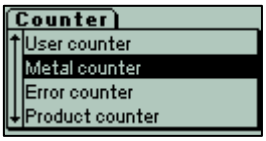


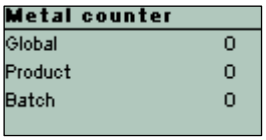


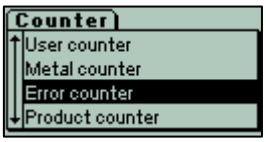


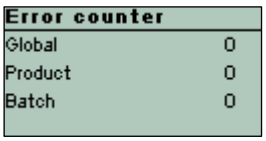


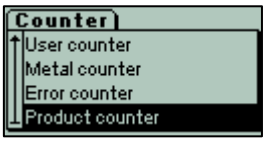


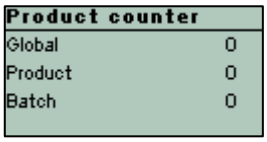


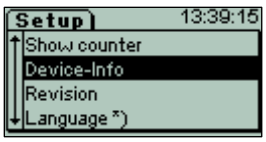


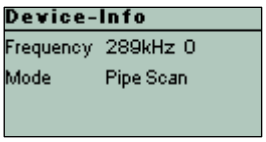


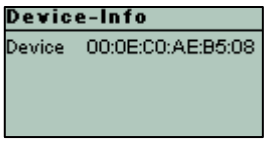


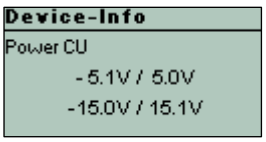


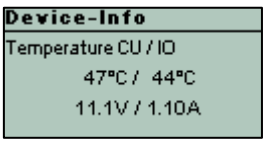


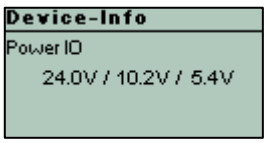


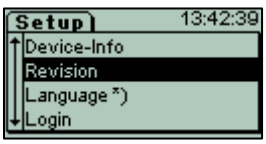


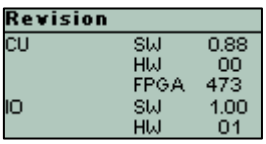


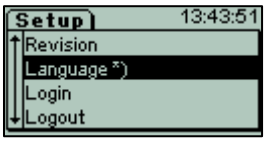


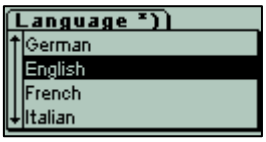








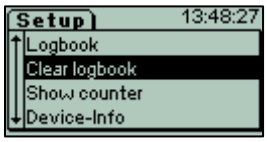


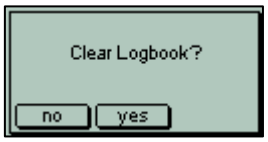


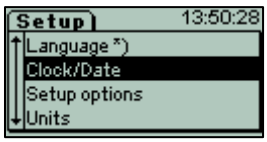
- German
- English
- French
- Italian
- Spanish
- Dutch
- Japanese
- Czech
- Russian
- Greek
- Swedish
- Turkish
- Polish
- Hungarian

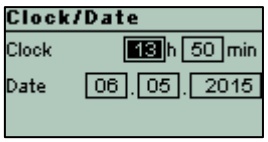
Overview 2
In addition to the standard menu items the following menu items can be selected in setup level 1.

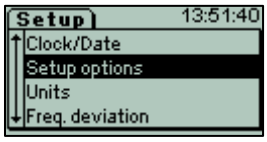
Setup level 1, **code 1000**

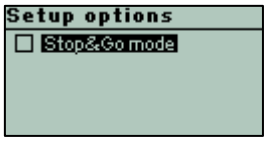


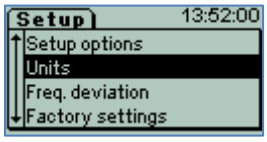


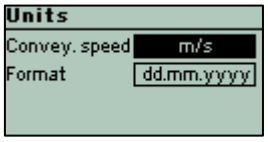


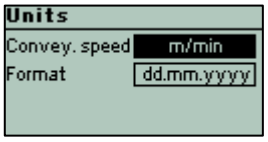


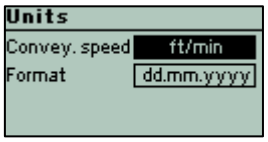


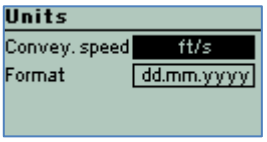


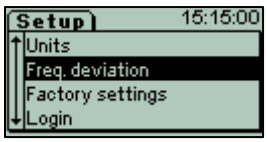


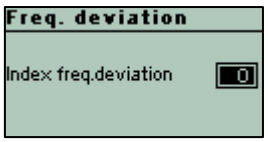


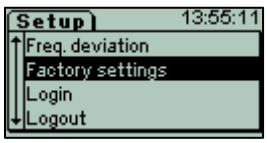






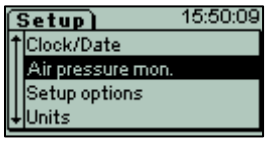


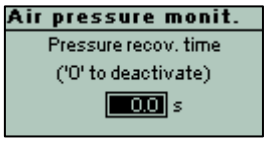




Overview 3
In addition to the standard menu items the following menu items can be selected in setup level 2.

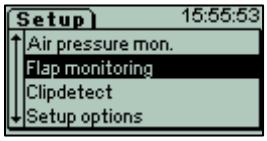
Setup level 2, **code 2000**

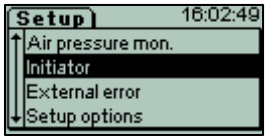


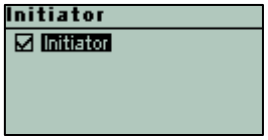


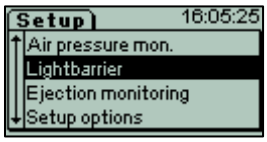
The PRIMUS+ control unit has two inputs. Depending on the factory settings and function corresponding settings can be made in the setup menu for sensor 1 and sensor 2.

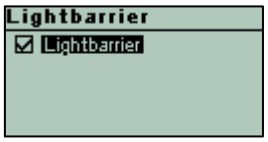
Sensor 1



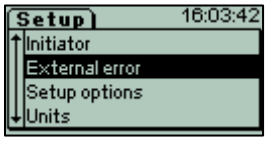


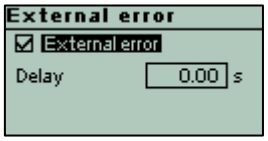


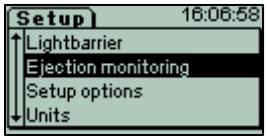


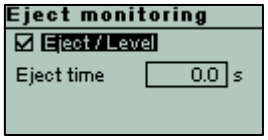


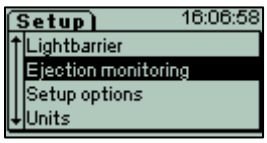
Sensor 2

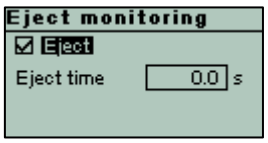


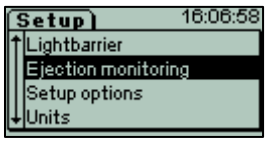


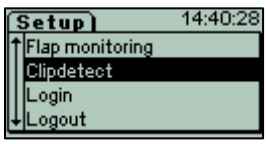


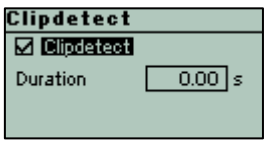




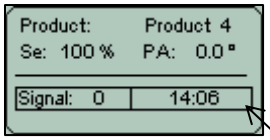


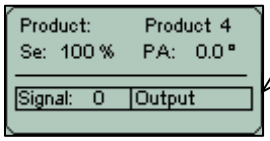






6.3.6 Operating mask



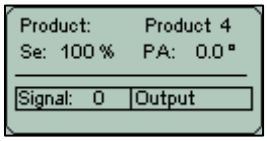


Displayed in normal operation mode.
Displayed information:
Current product name (top right)
Se: Sensitivity (0 - 100%)
PA: Product angle (0° - 180°)
Info field: Current time, status of outputs etc….

Signal: Current signal of the metal detector
Signal value >100 → Metal signal

Different displays:

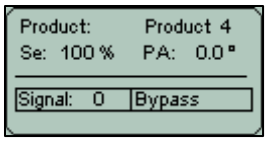
The Control Unit PRIMUS+ needs approx. 5 sec. for the start-up process.



If the outputs are disabled via menu settings, the display will illustrate this by showing

Output OFF

In addition, the green operating/fault light is off and a log entry is created.

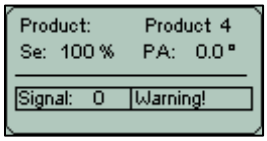


If metal detection is deactivated over the digital bypass, the display shows

ByPass

The Operation/Fault LED goes off (not operating), and an entry is made in the logbook.

This display appears in case of an error message. The Operation/Fault LED flashes red, and a corresponding entry is made in the logbook.
This example shows an error from air pressure monitoring.
When the cause of the error has been remedied, the error message can be reset by pressing the hardware RESET key.

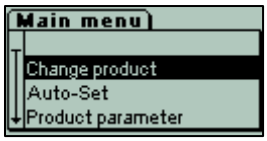


Warning messages have no influence on the operation of the system.
Warning in case of
- Battery power too low or battery missing.

The Operation / Fault LED flashes green.

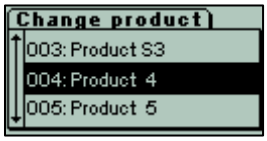
On detection of metal, the mask on the left is displayed, the red metal light comes on and a log entry is created.

6.3.7 Change product

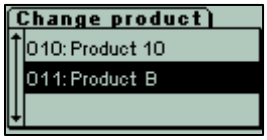


- Starting from the operating mask, press the ↵ key in the main menu to select the Change product menu item.

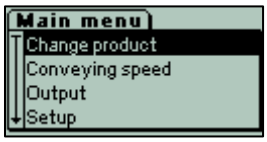
PRIMUS+ can save up to 10 different products and their corresponding parameters. This functionality enables quick product changes.



- Select the desired product from the list with the ⊕ and ⊖ keys, and confirm your product selection by pressing the ↵ key.
- The system automatically changes back to the operating mask.

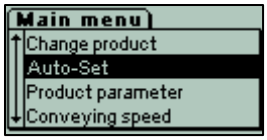


- Press the ↵ key to return to the operating mask without changing the product.
- Product B can be used to change the system to factory settings without being able to make changes at the product parameters.



The menu items Auto-Set and Product parameter in the main menu can no longer be selected.

6.3.8 Auto-Set

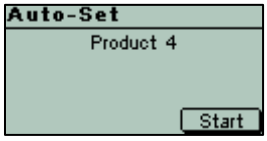


- Starting from the operating mask, press the ↵ key in the main menu to select the Auto-Set menu item.

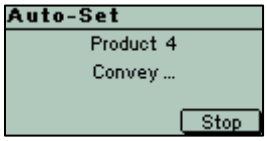
- This input mask is displayed, if the menu level is password-protected. Passwords are set by the customer.

This function is used to quickly set the metal detector to the properties of a new product or of the operating environment.
Product memories 1 to 3 have fixed preset product parameters. Auto-Set **only** is possible for product memories **4 – 10**.

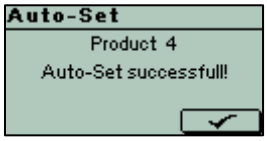
ℹ	**Ensure that only metal-free products are being used.**



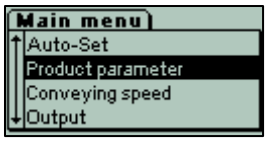
- Starting from the main mask, press the ↵ key to confirm your selection.
- Press the ↵ key to start the function, then convey the respective product several times, at least twice.



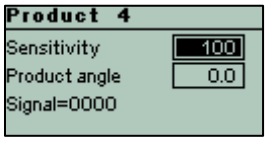
Press the ↵ key to stop the function. If you continue to convey the product additional times, this has no influence on the result of the product parameters.



Press the ↵ key to close the function.



- In the Product parameter menu the "Sensitivity" and "Product angle" parameters can be further optimised manually.
- Use the ⊕ and ⊖ keys to change the respective parameter, and then press the ↵ key to confirm the value.



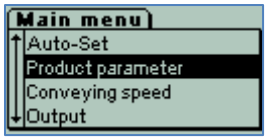
The signal display illustrates how recent changes affect the system's performance.

PRIMUS+ is now optimised for the product and the environment.

Test the device with a metallic object.

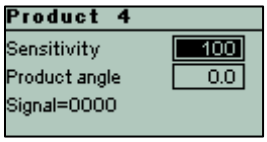
6.3.9 Product parameter

Starting from the operating mask, press the ↵ key to select the Product parameter menu.



- In the Product parameter menu the "Sensitivity" and "Product angle" parameters can be further optimised manually.

- This input mask is displayed, if the menu level is password-protected. Passwords are set by the customer.

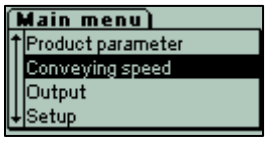


- Use the ⊕ and ⊖ keys to change the respective parameter, and then press the ↵ key to confirm the value.

The signal display illustrates how recent changes affect the system's performance.

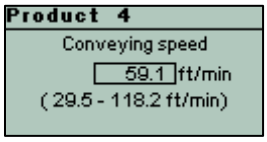
ℹ	**Changes in this menu are only applied for the current product.**

6.3.10 Conveying speed



- Select "Conveying speed" with ↵.

- This input mask is displayed, if the menu level is password-protected. Passwords are set by the customer.



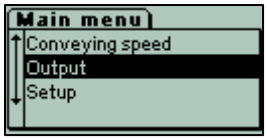
- Use the ⊕ and ⊖ keys to set the conveying speed, and press ↵ to confirm the value. Press the Esc key to cancel the process without making any changes.

The two figures in brackets show the optimal speed range that can be covered with the above setting.

ℹ	**Changes in this menu are only applied for the current product.**

6.3.11 Output

Starting from the operating mask, press the ↵ key to select the Output menu.



Output menu for setting the outputs **MV1/2/3** and **MR1.**

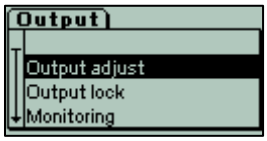
Use the + and − keys to select individual menu items, and then press ↵ to open the menu item.

Press Esc to exit the sub-menu and change back to next higher menu level.

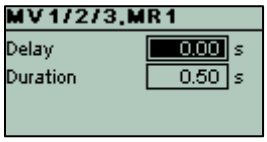
- This input mask is displayed, if the menu level is password-protected.
  Passwords are set by the customer.

Output menu
- Output adjust
- Output lock
- Monitoring
- Output Level
- Outputs options

6.3.11.1 Output adjust

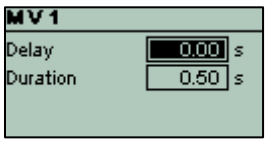


Depending on the settings under menu item **"Output options"** the switching times for delay and duration of the outputs can be set here in a range from 0 to 60s in 50ms steps.



MV1/2/3 (magnet valves, 24VDC outputs) and **MR1** (metal relay 1).
Example:
[ ] Outputs independent
All the times for delay and duration apply to all the outputs.

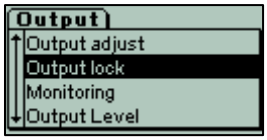
- Use the + and − keys to set the respective times.
- Confirm **both** input fields with ↵ to save the times.
- Press Esc to cancel the process without making any changes.



Example:
[x] Outputs independent

MV1, set delay and duration only for MV1
(MV2, MV3 and MR1 can be set in the same way).

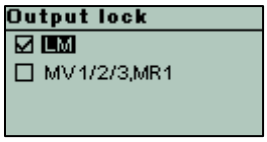
6.3.11.2 Output lock



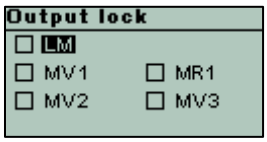
- Output lock means that after a metal event the outputs are activated for the set delay time, but are not automatically reset.
- Resetting must be done by pressing the Reset key.
- The option can be set for MV1/2/3 and MR1, and for the LM output (lamp metal).

Comment:
With "Reset mode [Manual]" all the outputs are "Locked“ and the menu thus is not available.

Mask 1



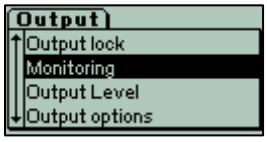
Mask 2

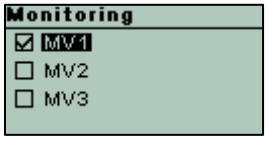


Mask 1 with [ ] Outputs independent
Mask 2 with [x] Outputs independent

- With + key [x] LM → Output "Lamp Metal" locked.
- With − key [ ] LM → Output "Lamp Metal" without lock function.
- Confirm **all** input fields with ↵ to save the functions.
- Press Esc to cancel the process without making any changes.

6.3.11.3 Monitoring



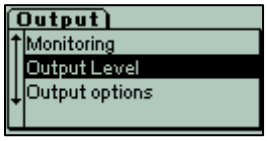


- Monitoring can be set for the connection of magnet valve **MV1/2/3**.
- The connection is monitored for broken cable and short-circuit.

Example for MV1:

- With + key [x] MV1 → MV1 monitoring activated.
- With − key [ ] MV1 → MV1 monitoring deactivated.
- Confirm **all** input fields with ↵ to save the settings.
- Press Esc to cancel the process without making any changes.

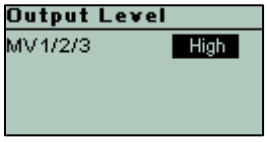
6.3.11.4 Output Level



- Output level means that in case of a metal event the respective output is activated depending on the setting.

  "High" output is activated.
  "Low" output is deactivated.
  "Inactive" no output level.

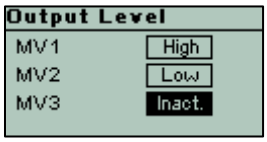
Mask 1



Mask 1 with [ ] Outputs independent

- With + or − key MV1/2/3 [High] → All outputs high-active.
- With − or + key MV1/2/3 [Low] → All outputs low-active.

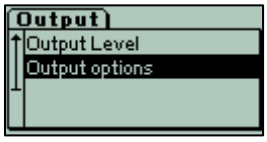
Mask 2



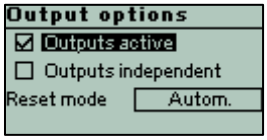
Mask 2 with [x] Outputs independent

- MV1/2/3 can be set independently.
- MV2 and MV3 in addition can be set to [inactive].
- Confirm **all** input fields with ↵ to save the settings.
- Press Esc to cancel the process without making any changes.

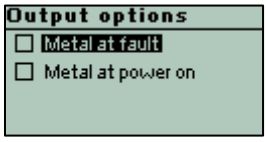
6.3.11.5 Output options



In the "Output options" menu several functions can be set for the outputs MV1/2/3, MR1 and LM.
These functions have an influence on the masks and settings in other menu items.



[x] Outputs active → Switching function in case of metal as set
[ ] Outputs active → **No** switching functions in case of metal
No entry in the logbook
"Output OFF" display in the operating mask



[x] Outputs independent → Duration and delay for every output
[ ] Outputs independent → Duration and delay for all outputs

Reset mode [Autom.] → Duration and delay
(metal message is reset automatically)
Reset mode [Manal] → Only delay
(metal message is reset manually)

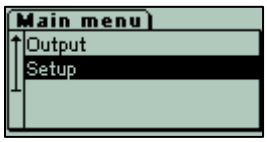
[x] Metal at fault → Metal message also in case of a fault.
[x] Metal at power on → Metal message until operating status.

Example:

- With ⊕ key [x] Outputs active
- With ⊖ key [..] Outputs inactive
- Confirm **all** input fields with ↵ to save the settings.
- Press Esc to cancel the process without making any changes.

6.3.12 Setup

Starting from the operating mask, press the ↵ key to select the Setup menu.



Use the ⊕ and ⊖ keys to select individual menu items, and then press ↵ to open the menu item.

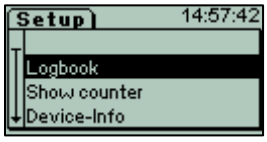
Press Esc to exit the sub-menu and change back to next higher menu level.

Setup menu
- Logbook
- Show counter
- Device-Info
- Revision
- Language*)
- Login
- Logout

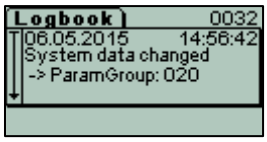
This input mask is displayed, if the menu level is password-protected.
Passwords are set by the customer.

!	**Changes in this menu are effective for all products.**

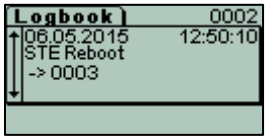
6.3.12.1 Logbook



- Select "Logbook" with ↵.



- Scroll through the saved incidents with ⊕ and ⊖. All incidents are in chronological order and displayed with date and time.
- Leave "Logbook" with ↵.



The logbook contains 100 entries which are permanently saved.

The following information is available:

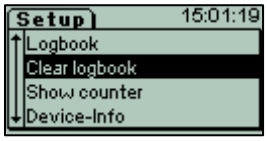
- Running number of the entry.
- Date and time of the incident.
- Message (error messages are marked with a).
- Optional: 2 lines of additional information (depending on entry).

	Attention When the maximum number of entries is reached, the oldest entries will be deleted without asking.

The following messages and information are displayed in the logbook:

Type	Incident	Additional Information	Comment
Metal	Metal	- Global metal counter - Metal signal	
Info	Mains on/off		
	Product change	- Old Product number - New Product number	
	Change of product data	- Current Pd. number - Product data group	For learning, product angle and sensitivity are also displayed
	Charge change	- Charge number	
	Outputs on/off		
	Metal incident	- Metal signal	Active during test
	Time /date settings		
	Change of system data	- System data group	
	EEPROM Grundinit		
	Bypass active		
	RESET error		
	Login	ID	
	Logout		
	Transmitter temperature		
	Receiver too high		
	EEPROM		
Error	Receiver too high	- Error counter (global)	
	Transmitter over-temperature	- Error counter (global)	
	Flap position	- Error counter (global)	
	Air pressure	- Error counter (global)	
	Reject container full	- Error counter (global)	
	Reject control	- Error counter (global)	
	Light barrier	- Error counter (global)	
	EEPROM	- Error counter (global)	
	External error	- Error counter (global)	

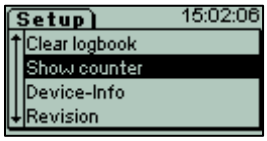
6.3.12.2 Clear logbook (Menu item requires login)



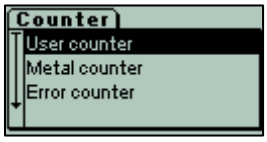
- Select "Clear logbook" with ↵.

- Deleting the logbook requires confirmation
- Cancel with ⊖ "no" and retain logbook.
- Delete logbook with ⊕ "yes".

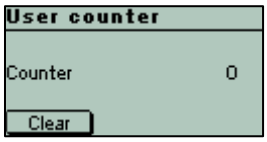
6.3.12.3 Show counter

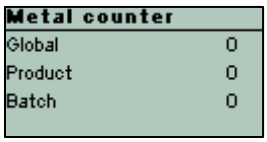


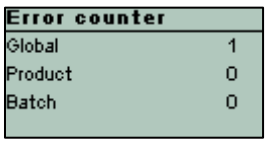
- Select "Show counter" with ↵.



- Use the ⊕ and ⊖ keys to select the respective counter, and then press ↵ to open the counter.





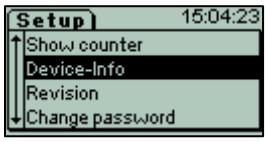


Available counters:

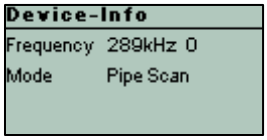
- **User counter**
  Sums up all metal incidents regardless of product of batch changes until reset by user.
- **Metal counter**
  Sums up all metal incidents.
- **Error counter**
  Sums up all error incidents.
- **Product counter** (only in combination with trigger light barrier)
  Sums up all conveyed products.

- **Global**
  All incidents since launch of device
- **Product**
  All incidents since selection of current product
- **Batch**
  All incidents since start of current charge

6.3.12.4 Device-Info

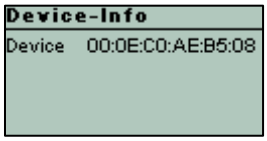


- Select "Device-Info" with ↵.

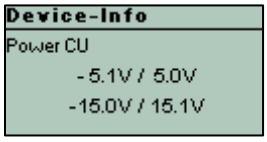


The display shows the currently set detection frequency and the currently set operating mode.

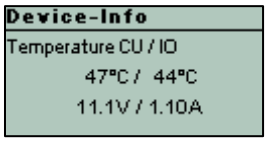
- Pipe Scan
- RAPID
- Vacuum/pressure conveying
- PROTECTOR
- Belt conveyor
- C-SCAN DLS



Serial number of the CU electronics board

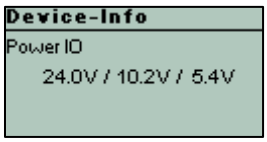


Voltage values of the CU electronics board
Nominal values
- 5V, +/- 0.1V +5V, +/- 0.1V
-15V, +/- 0.3V +5V, +/- 0.3V



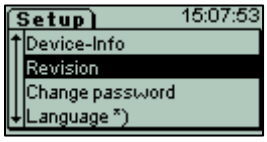
Temperature values of CU and IO electronics boards
Nominal < 80° C Nominal < 80° C

Voltage values of the coil connection
Nominal >11V Nominal < 1.2A

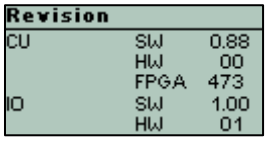


Voltage values of the IO electronics board
Nominal values
24V, +/- 0.4V +10V, +/- 0.4V 5.5V +/- 0.2V

6.3.12.5 Revision



- Select "Revision" with ↵.

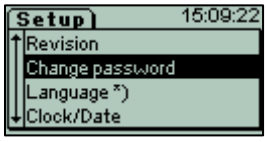


The display shows the revision numbers of the installed hardware and software components of CU electronics board and IO electronics board.

Info about the operating system that is used (licence).

- Press ↵ to exit the menu.

6.3.12.6 Change password (menu item requires login)



- Select "Change password" with ↵.

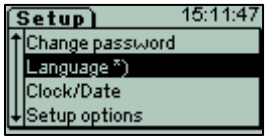
Available passwords:

- **Change product** for menu
  - „Change product“
- **Auto-Set/Product** for menu
  - „Auto-Set“
  - „Product parameters“
  - „Conveying speed“
- **Parameter** for menu
  - „Outputs“
- **Setup** for menu
  - „Setup“
  - „Service“

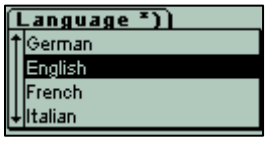
- Use the ⊕ and ⊖ keys to enter the figures, and confirm each with ↵.
- Press Esc to exit the sub-menu and change back to next higher menu level.

A password assigned previously has to be entered before a new one can be assigned.

6.3.12.7 Language

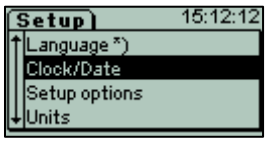


- Select "Language" with ↵.

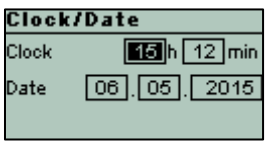


- Use the ⊕ and ⊖ keys to select the desired language, and confirm it with ↵.

6.3.12.8 Clock/Date (menu item requires login)

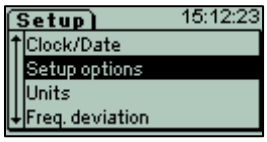


- Select "Clock/Date" with ↵.

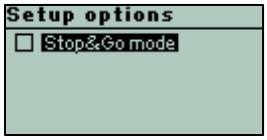


- Change digits with ⊕ and ⊖.
- Press ↵ to jump to the next value,
  after setting the year, save changes and exit the menu ↵.
- Cancel without changes with Esc.

6.3.12.9 Setup options (menu item requires login)



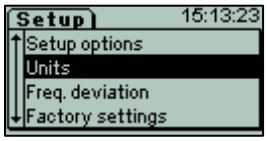
- Select "Setup options" with ↵.



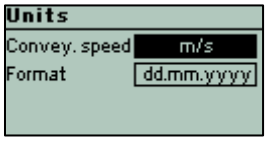
- With + key [x] Stop&Go mode active.
- With − key [ ] Stop&Go mode inactive.
- Confirm with ↵.

[x] Stop&Go mode: This option is necessary if products, for example due to a belt stop, can stop in the coil.

6.3.12.10 Units (menu item requires login)



- Select "Units" with ↵.



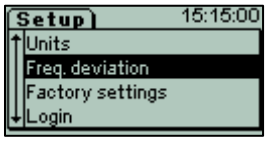
This menu item can be used to configure the country-specific format of the conveying speed unit and of the date/time format.

- Use the + and − keys to set the respective unit.
- Confirm **both** input fields with ↵ to save the settings.
- Press Esc to cancel the process without making any changes.

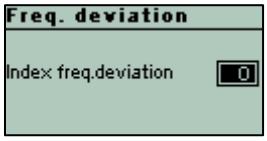
Formats for conveyor speed:	Formats for date and time:
- m/s - m/min - ft/s - ft/min	- dd.mm.yyyy - yyyy-mm-dd - mm/dd/yyyy

6.3.12.11 Frequency deviation (menu item requires login)

When several Sesotec metal detectors or metal separators with the same search frequency are used near each other, an interference in the signal can occur. To prevent this, a frequency deviation can be selected. Changes of pre-installed values should only be made after consulting Sesotec.



- Select "Freq. deviation" with ↵.

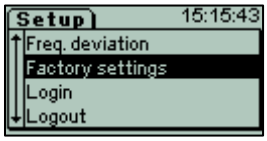


- Use the + and − keys to set the desired value, and confirm it by pressing ↵.
- Exit without changes with Esc.

The maximum approved range has been defined by Sesotec in final clearance.

6.3.12.12 Factory settings (menu item requires login)

With this menu item the system can be reset to the factory settings at the time of delivery.
System data an all product memories will be reset to factory settings, i.e. to the settings at the time of delivery.

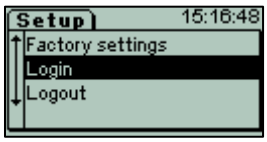


- Select "Factory settings" with ↵.

- For safety reasons you will be prompted to confirm the process.
- Press ⊖ "No" to cancel the process, the current settings will remain unchanged.
- Press ⊕ "Yes" confirm the process, system and product data will be reset to the settings at the time of delivery.

6.3.12.13 Login

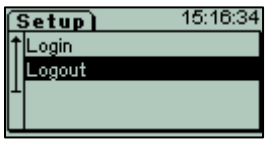
Protected parts of the **Setup** menu can be access by way of the **"Login"** and **"Logout"** menu items.
In every-day operation these items usually are not needed and are therefore hidden.



- Select "Login" with ↵.

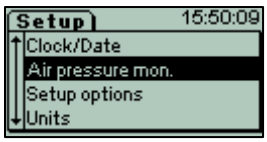
- Use the ⊕ and ⊖ keys to enter the respective figure and confirm each with ↵.
- To exit the menu, sign out or restart the device.

6.3.12.14 Logout

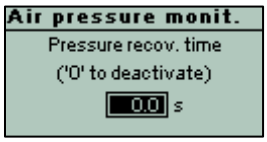


- Select "Logout" with ↵.
- Changes to operating mask and deactivates the entered code.

6.3.12.15 Air pressure monitoring (option) (menu item requires login)



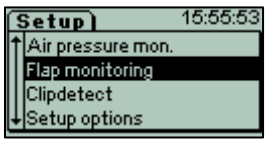
- Select "Air pressure mon." with ↵.



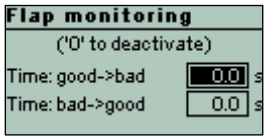
The air pressure can be monitored.
0.0s deactivates the monitoring.
A value different to 0 sets the maximum time, in which the air pressure can drop below the limit set in the pressure controller without creating an error message.

The value can be varied in steps of 2.5s up to a maximum of 10.0s.
Changing the factory pre-set value is usually.

6.3.12.16 Flap monitoring (option) (menu item requires login)



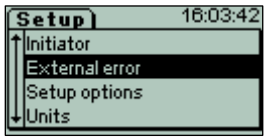
- Select "Flap monitoring" with ↵.



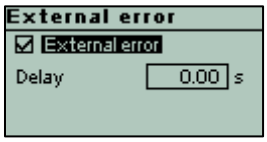
Flap monitoring can be configured in this menu.
0.0s deactivates the monitoring.
Values different to 0 set the time, which the flap may not extend when switching from normal position to reject position and vice versa.

The value can be varied in steps of 0.1s up to a maximum of 10.0s.
Changing the factory pre-set value is usually not required.

6.3.12.17 External error (option) (menu item requires login)

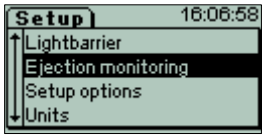


- Select "External error" with ↵.



This menu item is used to configure the external error input.
[x] Activated
[ ] Deactivated
The error signal only is accepted after the set delay time (error filter).
The value can be set up to 25.0s in 0.05s steps.

6.3.12.18 Ejection monitoring (option) (menu item requires login)



- Select "Ejection monitoring" with ↵.

In the ejection monitoring menu item the input, depending on the application, can be assigned different functions, e.g. level monitoring.

This item is used to configure level monitoring.
[x] Activated
[ ] Deactivated

- Level monitoring
  Shows whether the reject container still has free capacity.

7 Errors and error remedying

	If you should have any questions, or if there should be any malfunctions, please contact the manufacturer.

	If you have any questions, please state the equipment type and serial number!

Service telephone: +49 (0) 85 54 - 30 8-180

7.1 Error messages

In case of an error the Operating/Fault LED at the control panel flashes red, a corresponding error message appears on the display, and the fault relay (see page 24) drops. If the system is correspondingly configured, a metal alarm will also be activated.

7.1.1 Receiver voltage too high

This message appears if the signal that is received from the detection coil has a too high voltage.

Possible causes	Remedy
Big metal part (e.g. aluminium ladder, screwdriver, hammer, bracelets) directly beside or in the detection coil.	Check the detector head and the surrounding. Sometimes metal parts can be found inside or underneath the belt.
Improper installation of the search coil.	See operating instructions Detection coil: "Installation".

7.1.2 Receiver faulty

This message appears if the receiver connection cable is interrupted.

Possible causes	Remedy
Receiver cable between control unit and detection coil is interrupted.	Check the receiver cable for interruptions. Replace it, if necessary. Check the connectors of the connection cable. If necessary, plug them on/fix them again.

7.1.3 Transmitter faulty

This message is displayed if the transmitter signal is not detected or the connection to the detector is broken.

Possible causes	Remedy
Transmitter cable between control unit and detector has a short circuit or transmitter frequency is incorrect.	Disconnect transmitter cable at the detector (triax cable) and measure with Ohm meter: replace if necessary or check transmitter frequency.

7.1.4 Transmitter over temperature

Possible causes	Remedy
CU electronics board defective.	Replace the CU electronics board.
Coil or transmitter connection board defective.	Contact Sesotec service.

7.1.5 Hardware CU

Possible causes	Remedy
Self-monitoring (self-test) has detected an error on the CU electronics board.	Replace the CU electronics board.

7.1.6 Hardware IO

Possible causes	Remedy
Self-monitoring (self-test) has detected an error on the IO electronics board.	Replace the IO electronics board.

7.1.7 Communication IO

This message appears if communication between CU electronics board and IO electronics board is interrupted (see spare parts drawing 9.1) and data exchange is no longer possible.

Possible causes	Remedy
Interface module defective.	Replace the CU and/or IO electronics board.

7.1.8 Watchdog

Possible causes	Remedy
Software error of the CU electronics board.	If this occurs several times, contact Sesotec service.

7.1.9 Memory error

Possible causes	Remedy
System and product data memory defective.	Check whether the memory module is properly inserted in the socket (see page 12).
	If necessary, replace the memory module. Then select menu item "Factory settings".
	Replace the CU electronics board.

7.1.10 Short circuit MV

This message is displayed if there is a short circuit in the magnetic valve switching outputs.

Possible causes	Remedy
Short circuit or connection broken to magnetic valve 1.	Check valve cable for breaks and renew if necessary. Check valve cable plug and socket connections, remove and reinsert if necessary.

7.1.11 Connection MV

This message is displayed if there is a break in the magnetic valve switching outputs.

Possible causes	Remedy
Short circuit or connection broken to magnetic valve 2.	Check valve cable and connectors with Ohm meter for short circuit, replace if necessary. Check magnetic valve resistance which should be 320...340 Ω (or 100...140 Ω for pusher application).

7.1.12 Air pressure

Possible causes	Remedy
Appears on display if the air pressure monitor responds or the connection to the sensor is interrupted.	Check the connection cable to the pressure sensor.
No air pressure or air pipe broken.	Check air supply.
Operating threshold of pressure monitor is set too high.	Adjust pressure monitor.

7.1.13 Diverter position

Possible causes	Remedy
Appears during reject operation of the diverter, if signal timing is not correct, diverter is broken diverter too slow Forward and return time set too short. Connection to the sensors defective.	 Fix the diverter mechanics Check diverter if tight or wedged pieces Check air pressure (min. 5 bars) Caution! Danger of accident! Disconnect air supply! Prolong the time settings. Check cable and sensors.

7.1.14 Sensor 1 faulty

Possible causes	Remedy
Error signal at the sensor 1 connection on the IO electronics board (terminal 18). Sensor connection for flap monitoring. Sensor connection for initiator – distance measurement. Sensor connection for sync – light barrier.	Find the cause of the error and remedy it. Replace the sensor.

7.1.15 Sensor 2 faulty

Possible causes	Remedy
Error signal at the sensor 2 connection on the IO electronics board (terminal 26). Sensor connection for external error. Sensor connection for initiator – filling level. Sensor connection for initiator – clip detector.	Find the cause of the error and remedy it. Replace the sensor.

7.1.16 Filling level

Possible causes	Remedy
The container is full.	Empty container.
Is the sensor faulty?	Change sensor.
The sensor is not connected, or the connection cable is interrupted.	Check the sensor connection.

7.1.17 External error

Possible causes	Remedy
Error signal at the external error input of the IO electronics board. Alarm message of the frequency inverter. For example: Thermal contact of motor protection.	Find the cause of the external error and remedy it.

7.2 Undefinable activation of the switching outputs

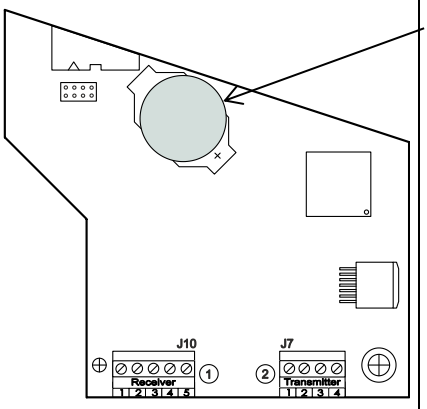
Possible causes	Remedy
Improper installation of the search coil	See operational manual detector coil: "Mounting"
Conveyor belt systems: Intermittent contacts on the conveyor frame for example due to: • Loose guide plates • Loose screw connections on the frame parts Changing contact resistance on the tension and deflection roller bearings or on the drive roller Certain parts of the conveyor belt are conductive: • Contaminated with metal (welding spatter, metal chips, abraded material….). • Belt junction causing metal alarm to signal even when no product on moving conveyor.	Check and tighten all screw connections If necessary weld frame parts. Insulate cross connections or tension and deflection rollers on one side. Clean conveyor belt of all residue. If necessary replace conveyor belt.
Circular coils: Mechanical contact between scanning pipe and detection coil.	Observe a minimum distance of 10mm between pipe and coil. If necessary use a scanning pipe with smaller diameter.
Sensitivity setting too high.	Repeat product teach-in procedure, if necessary reduce sensitivity manually.
Metal particles hard to identify due to corrosion or encapsulation.	Check processed material carefully, if necessary pass through detector again.
Loose contact at the detector cables.	Check connections.
Material or conveyor statically charged (cracking sound heard at the detection coil).	Prevent static by additional earthing (please consult manufacturer) or by using ion spraying devices.

7.3 Replacing the backup battery

	Because of energised components in the electronics housing there is a risk of injuries due to electric shock or burns. Therefore such work may only be performed by a qualified electrician under strict observation of the attached warning labels and with due regard to standard approved rules of electrical engineering.

1. As a precaution, make a backup copy of the logbook entries.
2. **Do not** turn off the power supply to avoid any loss of data.
3. Open the cover of the electronics housing.

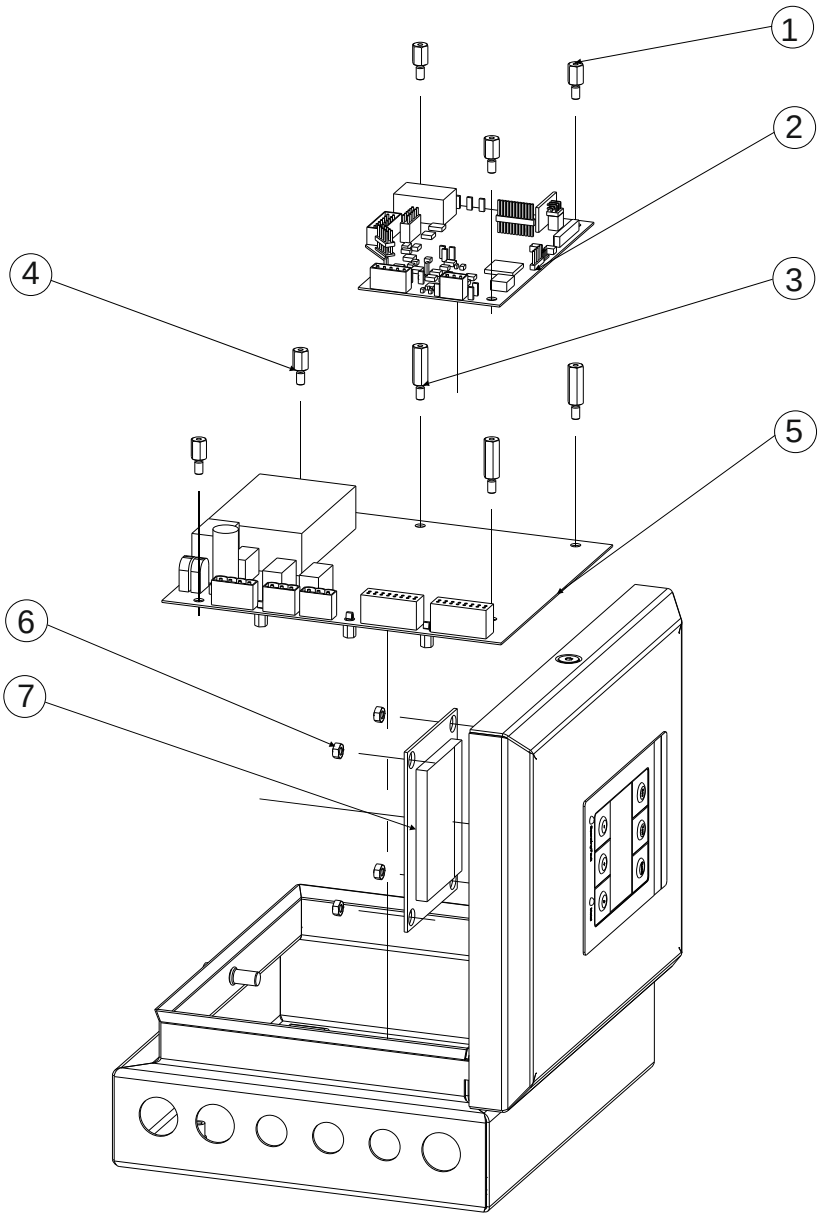
Procedure - Replacing the backup battery:

	Button cell CR2032 (for STE article number 33011070): 1. Carefully remove the old backup battery a) from its holder 2. Insert the new backup battery. 3. Always observe the correct polarity (positive pole on top)! 4. Close the cover of the electronics housing again. 5. Check whether the date and time settings are still correct, and whether the logbook entries are still there.

	If the backup battery is not replaced in time, the following data will be lost: Date and time.

7.4 Replacement of electronic boards

The Control-Unit PRIMUS+ consists of the following three boards: **CU electronics board** (2), **IO electronics board** (5) and **display board** (7).

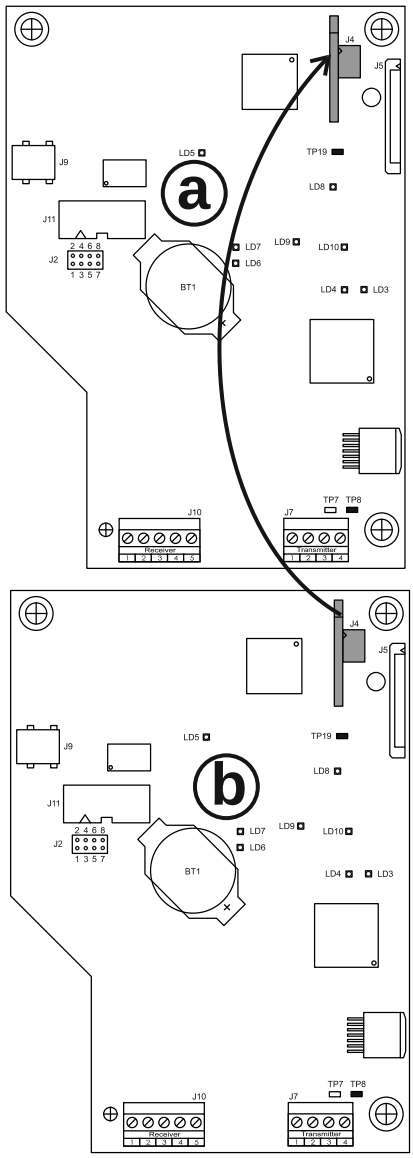


7.4.1 Replacing the CU electronics board PRIMUS+

1. Disconnect voltage supply and external circuits and open the cover at the electronics housing.
2. Remove connectors and remove the fastening screws (1).
3. Remove the CU electronics board (2).
4. Install the new board in reverse order, **but do not connect mains power supply!**

	The data memory is located on the CU electronics board (evaluation electronics board). The memory contains all device and product parameter settings. If this memory device is transferred to a new board no new settings must be performed.

Transferring all settings



(a) New controller board

(b) Old controller board

Procedure:

1. Remove the data memory module from the new (already installed) CU electronics board (a) and place it aside.
2. Remove the data memory module from the old CU electronics board (b) and insert it in the memory socket of the new CU electronics board (a).
3. Switch on power supply. The new board runs with the "old" settings.

When the system and product data memory module is replaced, the date and time information will **not** be adopted (because this information is saved in the battery-powered memory):

7.4.2 Replacing the IO electronics board PRIMUS+

1. Disconnect voltage supply and external circuits and open the cover at the electronics housing.
2. Remove the used connectors and remove the fastening screws (1), (3) and (4).
3. Remove the CU electronics board (2).
4. Remove the IO electronics board (5).
5. Install the new IO electronics board (5) and the other components in reverse order!

7.4.3 Replacing the display board

1. Disconnect voltage supply and external circuits and open the cover at the electronics housing.
2. Remove the used connectors and remove the fastening screws (6).
3. Take out the display board (7).
4. Install the new board in reverse order!

8 Maintenance and cleaning

Prior to cleaning turn off the system with the master switch and disconnect the system from the mains voltage.

8.1 Maintenance

The PRIMUS+ control unit is maintenance-free, yet it is still appropriate to inspect the equipment in regular intervals:

- Are all the fastening screws tight?
- Is the housing seal in perfect condition, and does it provide proper sealing?
- Also check all the cables for possible damage (e.g. at the cable sheath).

8.2 Cleaning

8.2.1 Hints for cleaning

- Please ensure you follow the instructions below.
- Specific machine components must be cleaned with specific substances. Please use the correct materials and clean at regular intervals as suggested.
- If the building is being cleaned ensure the machines are covered up.

The following must not be used for cleaning:

- Sharp, hard or pointed objects
- Water or steam jet appliances
- Compressed air
- Hazardous and solvent-containing materials
- Cleaning agents that may attack the materials used

8.2.2 Cleaning instructions

For cleaning purposes we recommend that you use warm water with approved cleaning agents for the respective application, and a soft, lint-free cloth. Once every week the coil shaft should be thoroughly cleaned, removing any dirt accumulations and deposits. After cleaning wipe up any remaining drops of water with a dry, non-fibrous cloth until the coil shaft is dry. From time to time apply oil to the stainless steel framework (e.g. Nirostol 55 cleaning and maintenance oil which meets food industry standards).

8.2.3 Care advice for stainless steel

Only high-quality stainless steel is used in the systems. To prevent rust on the high-grade steel parts do not use substances containing chloride (e.g. cleaning or disinfecting products) or operate the machine in an atmosphere containing chloride. If this is unavoidable the steel parts must be thoroughly rubbed down immediately afterwards with cleaning oil e.g. Nirostol 55 cleaning and maintenance oil (which meets food industry standards).

Important information for stainless steel models

Stainless steel models are extremely weatherproof and are therefore able to withstand most environmental conditions.

However, even stainless steel can be susceptible to a slight film of rust.

These deposits are caused by contact corrosion and can be removed by following the instructions below:

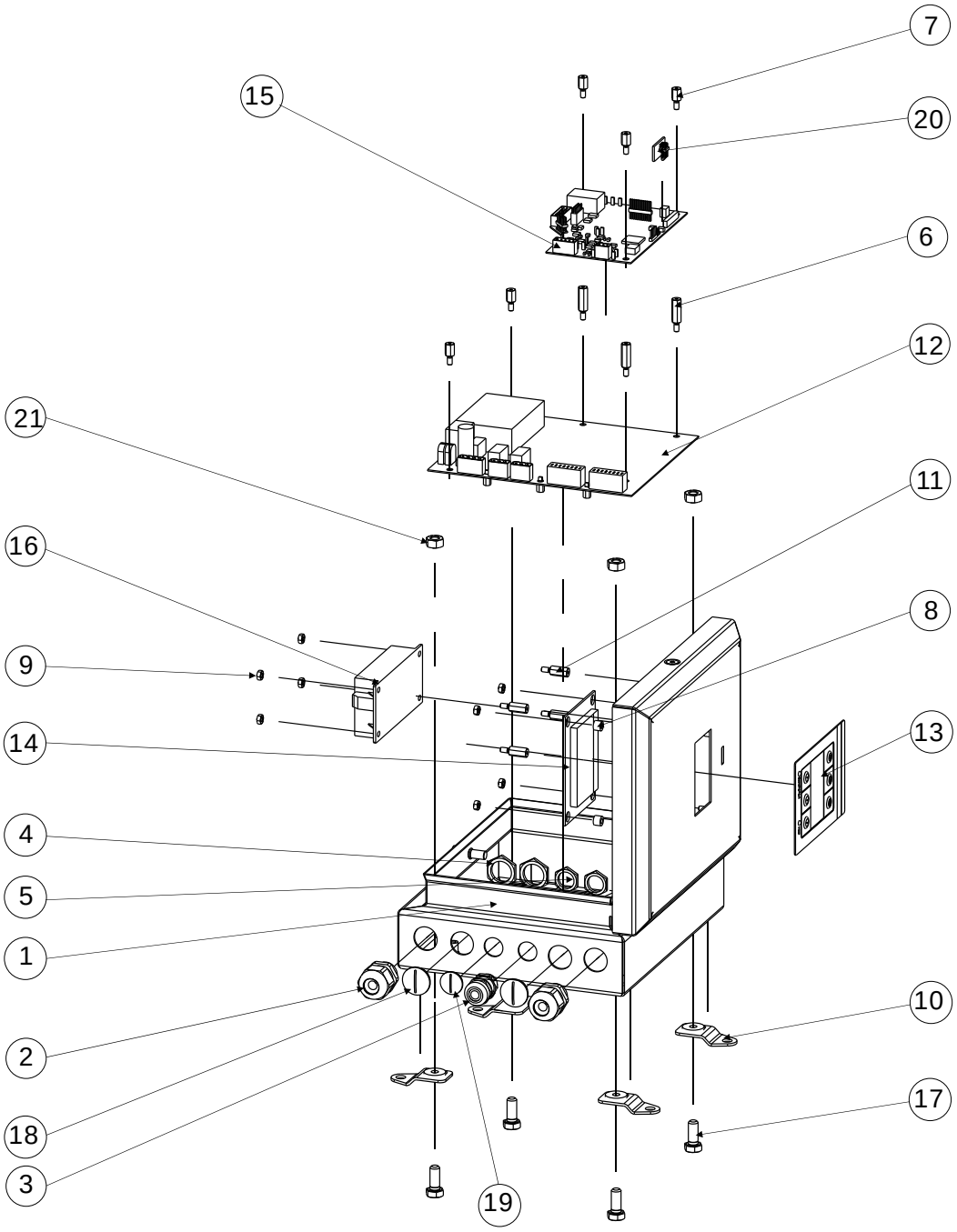
- Use a stainless steel cleaner: in principle any stainless steel cleaner may be used. Please ensure you read the instructions prior to use.
- Use only cleaning agents that are halogen-free (i.e. without chlorides and fluorides), and salt and hydrofluoric acid free.
- After each cleaning rinse the machine thoroughly with tap water
- Do not use the following: non-alloy materials or substances, abrasive cloths, cleaning agents containing salt or hydrofluoric acid, chrome, silver or brass cleaners.

9 Spare parts

If you should have any questions please state equipment type and serial number!

	Spare parts and wearing parts must always be obtained from the manufacturer of from a supplier that is certified by the manufacturer.

9.1 Spare parts view



9.2 Spare parts list

Item No.	Part	Part No.	Material	Art. No.	Sp/Con
1	Electronics housing PRIMUS+	Z0065803		77080254	Sp
2	Cable threaded joint MS-M 20x1.5			33001012	Sp
3	Cable threaded joint MS-M 16x1.5			33001010	Sp
4	Nut 50220 M for cable threaded joint			33001004	Sp
5	Nut 50216 M for cable threaded joint			33001002	Sp
6	Distance bolt M4x20			31160822	Sp
7	Distance bolt M4x10			31160820	Sp
8	Bush			77101378	Sp
9	Hexagon nut M4			31160908	Sp
10	Wall mount for control cabinet (accessory)			08006717	Sp
11	Distance bolt M4x15			08023239	Sp
12	IO electronics board PRIMUS+			77103219	Sp
13	Membrane keypad PRIMUS+ Sesotec			77100328	Sp
13	Membrane keypad PRIMUS+ Neutral			77100326	Sp
14	Display PRIMUS+			33015460	Sp
15	CU electronics board PRIMUS+			33015446	Sp
16	AC/DC converter (option)			33013134	Sp
17	Hexagon screw M8x20			15090400	Sp
18	Screw plug M20x1.5			33001018	Sp
19	Screw plug M16x1.5			33001016	Sp
20	Memory module (data memory)			77100949	Sp
21	Hexagon nut M8x8			15083200	Sp

*Sp/Con = Spare part / Consumable

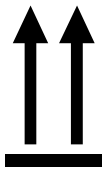
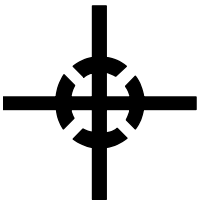
10 Shipping, preservation, waste disposal, transport, storage

10.1 Shipping, preservation, waste disposal

1.	Choose packing that is suitable for the type and size of unit, taking into account whether the shipment is for export by sea or airfreight, or for national or international road transport The packing material must protect the goods from all damage under normal transport conditions.	
2.	Depending on the size, weight and nature of the goods packing in cardboard boxes, boxed pallets etc is only suitable for road transport. Use reinforced card, corrugated cardboard, blister packing and shredded paper to fill and protect the goods. Electrostatic sensitive components (electronic boards, electronic modules, etc.) must be packed in antistatic foil or foil bags prior to packing! **(this is essential!)** Stick additional warning labels on the outside of the packaging e.g. "Attention, electronic equipment, do not drop," etc. The packing should be sealed with adhesive tape and, where the weight exceeds 50 kg, additionally with wrapping tape..	
2a.	When packing for international road transport use the instructions above (see point 2). Larger and heavier shipments must also be protected as for export in wooden crates. Care must be taken to ensure that the goods inside the packing are protected against corrosion. Any parts that will corrode easily must be wrapped in oil paper or corrosion-protective foil. Care must be taken to prevent the components moving around within the packaging.	
2b.	International air freight shipments must be packed in wooden crates or on export paltainers. Care must be taken that the goods are secure and well-protected inside the packing. Any parts liable to corrode must be wrapped in oil paper, protective foil or sprayed with anti-corrosion spray.	
2c.	Sea-freight must be packed in seaworthy export crates. These crates can be obtained from specialist suppliers. The crates must be lined with oil paper to make them resistant to sea water and prevent corrosion. In addition the goods must be protected against corrosion by use of a spray or be wrapping in protective foil. Care must be taken to ensure that the goods cannot move around inside the crate. After packing the sea-freight crates must be properly closed. The sea crates must also be fastened externally with securing tapes. During loading care must be taken not to damage the external packaging. The carrier must certify that the shipment has been accepted and loaded correctly by detailing this on the bill of lading, loading list etc.	
3.	Waste disposal: Observe the national waste disposal regulations.	

10.2 Transport

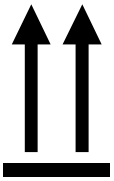
- In order to avoid injury or damage to the unit it must be handled properly. In addition to following the instructions below, general health and safety good practice and specific accident prevention guidelines should be observed.
- For correct handling and storage comply with the following symbols:

			
Protect against moisture	Careful: glass	Up	Centre of gravity

- Do not compress the side walls of the unit or any attached parts by pulling obliquely on ropes or chains.
- Only remove handling safeguards once all installation work has been completed.
- When handling in a loading area make sure the unit cannot topple over or slip.
- Damage caused during transportation must always be reported to the manufacturer.

10.3 Storage

- If possible the unit should be stored in a closed room until final installation.
- If the unit is stored in the open it must be covered over with tarpaulins and open underneath to allow condensation to drain off.
- Avoid any higher temperature fluctuations. It is possible that condensed water that has formed in the packing cannot properly drain and may corrode equipment surfaces. If a formation of condensed water cannot be avoided, suitable desiccants e.g. in the form of bags must be placed in the packing.
- If the unit has been packed for transportation by sea the packaging must not be damaged or opened during transit and storage.
- For storage temperature and permissible air humidity please refer to the technical data sheet.
- For correct storage comply with all storage and handling symbols:

		
Protect against moisture	Careful: glass	Up

11 Annex

- EC DECLARATION OF CONFORMITY
- Technical data sheet

Accessories:

- UL/CSA certificate