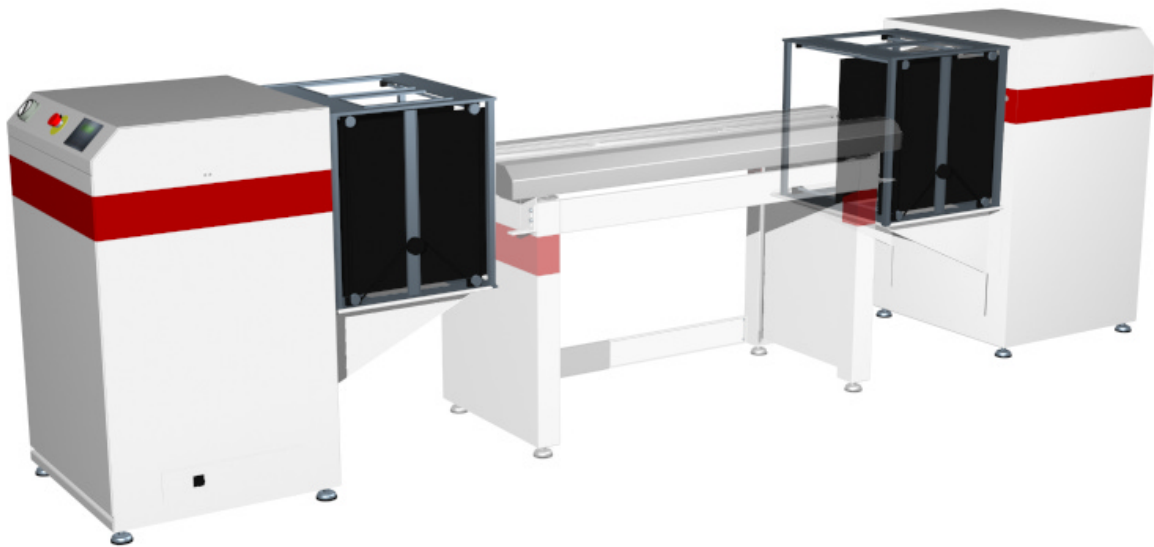


User's Manual

English



In-Line

***Light Manual Loader
Light Manual Unloader
Light Manual Reloader***

This manual is intended for the inline device specified on the previous page. The manual contains information to assist the operator to start and operate the device properly, and to maintain it. Hardware and software mentioned in this document are subjected to continuous development and improvement. Consequently, there may be minor discrepancies between the information in the document and the performance and design of the hardware and software. Specifications, dimensions and other statements mentioned in this document are subject to change without prior notice.

Conventions

In this manual angle brackets <> are used to indicate certain button names. Example: <Enter> stands for the ENTER button.

The manufacturer and its suppliers shall not be liable for any damages related to the software or hardware, or for any other damages whatsoever caused by the use of, or inability to use any manufacturers product. This is applicable even if the manufacturer has been advised of the damage risk. Under any circumstances, the manufacturer's entire liability shall be limited to replace such defective software or hardware, which was originally purchased from the manufacturer.
Printed in Sweden.

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1. Safety

Before starting the machine, it is necessary that the operator, foreman, and any other personnel involved in the machine operation, maintenance or service understand and obey the following:

- Trained personnel must operate the machine only.
- Anyone operating this machine must obey all warning signs.
- All personnel involved in machine operation must understand the use of the emergency stop button and how to move machine elements in case of emergency. See the following sections entitled *Emergency Stop Buttons* and *Emergency Movement of Machine Elements* in this chapter.
- Apart from weekly maintenance described in Chapter 5, *Maintenance*, the machine is to be serviced by authorised personnel only.
- No hands or fingers are allowed in the vicinity of moving parts.
- Ensure that all covers and shields are intact, mounted and closed while the machine is in operation.
- Do not disable or disengage any safety switches or sensors.
- Do not use chemicals or other substances that may have any influence on the operator or other personnel involved in machine operation.

Emergency stop button

There is an emergency stop button located at the cabinet, to the left of the control panel.

The emergency stop button is red and stops all machine movements immediately when pressed down.

The button is released by being pulled up and/or turned counter-clockwise.

The emergency stop button must always be pressed down when hands, fingers, tools or other objects are in the risk area of movable machine elements.

Restart

To restart the machine after an emergency stop:

1. Release the emergency stop button by pulling it up or turning it counter-clockwise.
2. Start the operation as normal.

Emergency movement of machine elements

The elevator unit cannot be moved by hand.



If an accident has occurred and an emergency movement of the elevator unit is required, use the following procedure:

1. Leave the power on. Do NOT turn off the main power switch.
2. Pull up the emergency stop button, if pressed down.
3. Press <F2> 'Hand' in *Main* menu to enter *Hand* mode.
4. Use buttons <F2> '-' and <F3> '-' to move the elevator.

Warning signs

The warning signs on the machine must be observed as this machine contains moving and electrically live parts.

All signs must be kept clean and readable. If a sign is missing, it must be replaced immediately.

Electric shock

The sign warns of electric shock. Units on which this sign is placed contain dangerous voltage levels. Power must be switched off before opening the unit. Only authorised service personnel are allowed to operate the machine when the unit is open.



Figure 1-1 Electric shock

This sign is applied as follows on the machine:

- One sign on the cabinet door

Moving parts, risk of injury

The sign warns of moving machine parts. If this sign is placed on the machine, there is a risk of injury if any body part is near moving parts. Power must be switched off before service or maintenance.



Figure 1-2 Moving parts, risk of injury

This sign is applied as follows on the machine:

- One sign on each side of the elevator unit

Warnings

Attention

Throughout the manual, this symbol is used to call your attention to commands that starts machine movements or other events that need special attention. The symbol often refers to the warning signs, which must be obeyed to eliminate the risk of injury. If there are instructions accompanying this symbol, they must be followed.



Figure 1-3 Attention

2. Installation

The machine is delivered on a pallet:

Before unpacking the machine, make sure that the site is prepared as described below.

Then, unpack and position the machine on the site. Lift and weight information is found below.

When the machine is located on its site, install it as described last in this chapter.

Site preparation

Prior to installing the machine, ensure that there is electric power and compressed air available on the site, see the requirements below.

Make sure the environmental conditions meet the requirements specified below.

Note that it must be a free space of at least one meter around the machine, except for other devices and machines included in the conveyor line.

Power supply requirements

Voltage

Supply voltage:	100-240 VAC
Voltage tolerance:	±10%
Frequency:	50/60Hz
Power consumption:	900 Watt maximum

Compressed air

The compressed air must be dry and clean.

Pressure:	6 bar
Largest particle size:	5 micron

Environmental requirements

Temperature

Operating: +5 to +40°C (41 to 104°F)
Storage: -40 to +60°C (-40 to 140°F)

Relative humidity

Operating: <95%, non condensing
Storage: 100%

Dust and dirt

The machine does not require a clean-room environment but the level of dust and dirt must be kept as low as possible. The maintenance intervals are shortened by high temperature and dusty or dirty environment.

Lifting information

The machine can be lifted with a forklift truck, if some wooden boards are put between the forks and the framework.

Weights

Loader: 90 kg
Unloader: 90 kg
Reloader: 90 kg

Installation



The installation must be carried out by authorised service personnel.

Placing the unit

Ensure that the floor is sturdy.

Place the machine on its site. To be able to install, maintain and service the machine, there must be a free space of at least one meter around it, except for other devices and machines included in the conveyor line.

Levelling

Level the complete line carefully along the conveyor belts. Let the pusher determine the height of the machine when adjusting levelling feet.

Use a spirit level across and along the elevator plate and adjust the feet of the machine. The machine must stay steady on all feet when the adjustment is finished.

Mains supply



Mains supply is to be connected by an authorised electrician.

The internal power supply can be adapted to two different mains voltage levels, 115 or 230 VAC. Use the selector switch on the front of the power supply to select correct setting according to available mains voltage. Disconnect mains supply using the main switch before changing selector switch position.

3. Product Description

This chapter describes the Loader/Unloader/Reloader. The description is divided into the following main sections:

- Main parts of the machine, page 9.
- General function, page 10.
- Control panel and buttons in the panel, page 12.
- Operation modes, page 13.
- Alarms and messages, page 23.
- Signal tower and buzzer, page 25.

Main parts

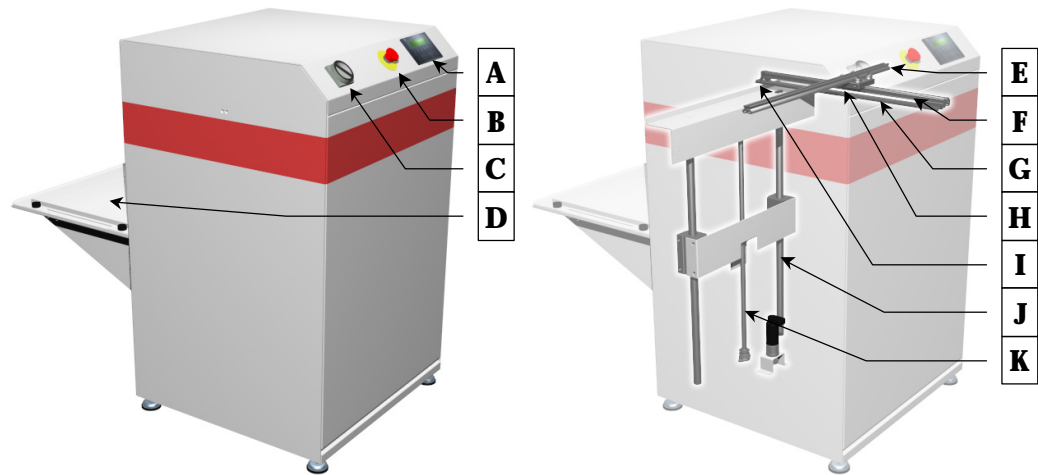


Figure 3-1 Loader/Unloader/Reloader main parts

The following main parts are pointed out in the figure above, by the letters.

Main parts

- A.** Control panel
- B.** Emergency stop
- C.** Main power switch
- D.** Elevator unit
- E.** Pusher guide
- F.** Pusher cylinder
- G.** Pusher arm
- H.** PCB release sensor (Unloader/Reloader)
- I.** Pusher PCB grip (Unloader/Reloader)
- J.** Elevator guide
- K.** Elevator lead screw

General function

The Loader is designed to move printed circuit boards from a PCB cassette to a board conveyor in a PCB assembly inline system.

The Unloader is designed to move printed circuit boards the other way round, i.e. from a board conveyor back to a PCB cassette.

The Reloader is designed to move printed circuit boards from a PCB cassette to a two-way board conveyor in a PCB assembly inline system, and receive the same board from the conveyor into the cassette slot it came from.

The PCB cassette maximum size is 570mm (H) x 580mm (W) x 535mm (D).

Letters within brackets in the following description refer to the main parts pointed out on the previous page.

Loader

A PCB cassette containing printed circuit boards is put on the elevator unit (D).

The pusher arm (G) pushes the printed circuit boards out of the cassette one by one, onto/into the following machine. The elevator unit moves the cassette vertically to the correct level for each board to be pushed out.

When the cassette is empty, the elevator unit moves it to a predefined cassette change level.

Unloader

If the Unloader is ready to receive a board, the pusher arm (G) is moved to its outermost position.

When the preceding machine has a board available, the pusher PCB grip (I) grabs the board and the pusher arm (G) is retracted. During retraction the pusher arm (G) reaches the position of the PCB release sensor (H) where the board is released.

When the pusher arm (G) is in its innermost position, the elevator unit moves the cassette vertically to the next level. When the cassette is full, the elevator unit moves it to a predefined cassette change level.

Reloader

A PCB cassette containing printed circuit boards is put on the elevator unit (D).

The pusher arm (G) pushes a printed circuit board out of a cassette slot, onto/into a two-way machine. The machine processes the board and makes it ready for transport back into the Reloader. When the preceding machine has a board available, the pusher PCB grip (I) grabs the board and the pusher arm (G) is retracted. During retraction the pusher arm (G) reaches the position of the PCB release sensor (H) where the board is released.

When the pusher arm (G) is in its innermost position, the elevator unit moves the cassette vertically to the next level. When all boards in the cassette are processed, the elevator unit moves it to a predefined cassette change level.

Control panel

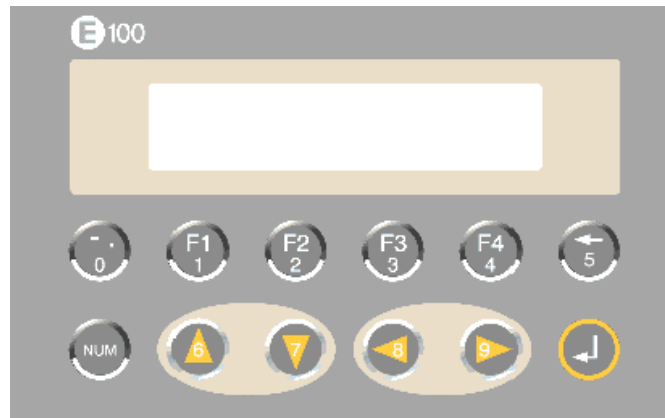


Figure 3-2 Control panel

General

The machine is controlled from a control panel. The various display views and operation modes are described in the following sections.

The control panel shown above, is located on the upper part of the control cabinet as shown on page 9.

The control panel buttons are described below.

Function Buttons

<F1>...<F4>:

Use these buttons to control the machine.

The buttons have different functions depending on mode and display view. A text/symbol describing the function in current display view is shown above each button on the lower text row. Buttons are indicated by bold angle brackets < > and text in this manual. Example: <F1> **Auto**.

Control Buttons

< ↵ >:

Also written as <Enter>, is used to enter password login in setup mode, to select setting options and to enter parameter values.

< ⌫ >:

Erases the character to the left of the cursor when entering parameter values.

Numerical Buttons**<NUM>:**

Hold this button while entering digits < 0...9 >.

Use together with <NUM> to enter values. Finish with <Enter>.

< - > :

Press once for hyphen. Shifts between positive and negative values.

< . > :

Press twice rapidly for decimal point.

Cursor Buttons (orange)**< ▲ > and < ▼ > :**

Move cursor up or down.

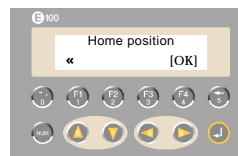
< ◀ > and < ▶ > :

Move cursor to the previous or next option.

Operation modes

Powering up

After completed initiation, a display view for home positioning is shown on the control panel.



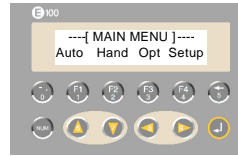
The operator can now execute a home positioning for the elevator unit by pressing <F4> 'OK', or skip home positioning by pressing <F1> '«'.

Generally, a home positioning is not necessary, but if service or maintenance of the machine is done, a home positioning is strongly recommended to guarantee correct elevator positioning.

This display view is not shown again until next power up, or if chosen from *Hand* menu.

Main menu

To control the machine, the following operation modes can be selected from the *Main* menu.



- *Automatic* mode
- *Hand* mode (Manual mode)
- *Option* menu
- *Setup* mode

These operation modes are described in the following sections.

Selecting operation mode

You can select the desired operation mode from *Main* menu as follows:

- To enter *Automatic* mode, press <F1> 'Auto'.
- To enter *Hand* mode, press <F2> 'Hand'.
- To enter *Option* menu, press <F3> 'Opt'.
- To enter *Setup* mode, press <F4> 'Setup'.

To exit the current operation mode and return to the main menu:

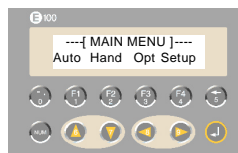
- Press <F1> '«' repeatedly, until *Main* menu is displayed on the control panel.



In case of emergency, use the emergency stop button to stop the movement immediately.

Automatic mode

Automatic mode is used for production, i.e. to provide the production line with printed circuit boards (Loader) and to gather them up at the end of the line (Unloader), or both (Reloader).



Select *Automatic* mode by pressing <F1> 'Auto' in the *Main* menu.

Load/Unload cycle descriptions are found on the following page.

Load cycle description, Loader and Reloader

This section is applicable to the Loader and Reloader only.

The cassette is positioned at the first PCB level and the boards are pushed out to the following machine.

When all boards have been pushed out, or if cassette change is selected in *Automatic* mode, the elevator moves to the cassette change level and a message on the control panel prompts the operator to change the cassette.

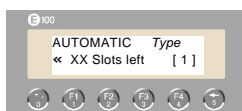
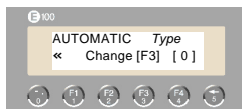
Unload cycle description, Unloader and Reloader

This section is applicable to the Unloader and Reloader only.

The cassette is positioned at the first PCB level and the boards are transported/retracted into the cassette.

When all available slots in the cassette are filled with boards, or if cassette change is selected in *Automatic* mode, the elevator moves to the cassette change level and a message on the control panel prompts the operator to change the cassette.

Automatic mode display views

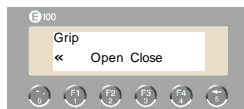
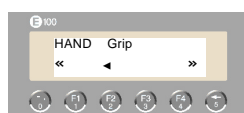
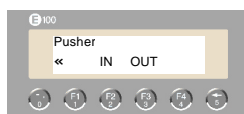
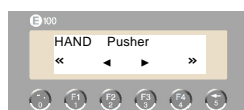
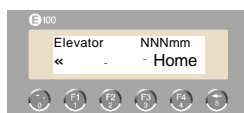
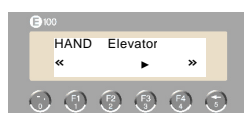
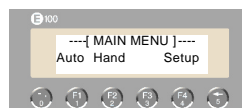


Parameter/ <Button>	Description
	<u>Automatic mode, production disabled</u> This display view is shown when entering <i>Automatic</i> mode.
<F1> <<	Return to <i>Main</i> menu. <i>Automatic</i> mode is set to OFF.
<F2>	Not used in this display view.
<F3> Change [F3]	Press <F3> to change cassette. This text is replaced by the message <i>Door open</i> when the magazine door is open. (Only on machines equipped with elevator cover.)
<F4> [0] [1]	Press <F4> to toggle state between [0] and [1]. [0]: <i>Automatic</i> mode is OFF. Production disabled. [1]: <i>Automatic</i> mode is ON. Production enabled.
Type	Shows current machinetype.
	<u>Automatic mode, production enabled</u> This display view is shown when <i>Automatic</i> mode is ON.
XX Slots left	Shows number of available slots in the cassette. If a cassette change is needed, the message <i>Change Mag!</i> is shown in this place, and if the magazine door is open, the message <i>Door open!</i> is shown. (Only on machines equipped with exhaust hood.)
<F1> <<	Return to <i>Main</i> menu. <i>Automatic</i> mode is set to OFF.
<F2>	Not used in this display view.
<F3>	Not used in this display view.
<F4> [0] [1]	Press <F4> to toggle state between [0] and [1]. [0]: <i>Automatic</i> mode is OFF. Production disabled. [1]: <i>Automatic</i> mode is ON. Production enabled.
Type	Shows current machinetype.

Hand mode

Hand mode is used to manually move the elevator unit, pusher arm, or Grip. Password login at level 3 or higher is required to move the pusher and to change state of the grip.

Select *Hand* mode by pressing <F2> 'Hand' in the *Main* menu.

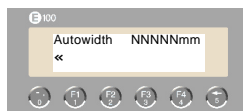
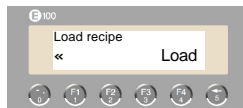
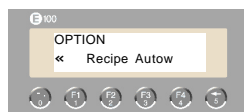
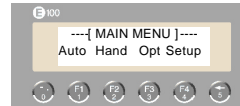


Parameter/ <Button>	Description
	<u>The first display view in <i>Hand</i> mode</u>
<F1> << > <F2> Not used <F3> ▶ > <F4> >> >	Return to <i>Main</i> menu. Not used in this display. Select next <i>Hand</i> sub menu (pusher). Enter selected <i>Hand</i> sub menu (elevator).
NNNmm	This value shows the current position of the elevator unit, in millimetres, with reference to the home position sensor that gives a signal to the PLC when the elevator unit is in its uppermost position. A lower position of the elevator unit will therefore show a higher value.
<F1> << > <F2> - > <F3> - > <F4> Home >	Return to previous display. Move the elevator unit upwards. Move the elevator unit downwards. Execute a home positioning cycle.
<F1> << > <F2> ◀ > <F3> ▶ > <F4> >> >	Return to <i>Main</i> menu. Select previous <i>Hand</i> sub menu (elevator). Select next <i>Hand</i> sub menu (grip). Enter selected <i>Hand</i> sub menu (pusher).
<F1> << > <F2> IN > <F3> OUT > <F4> Not used	Return to previous display. Retract the pusher arm to its innermost position. Extract the pusher arm to its outermost position. Not used in this display.
<F1> << > <F2> ◀ > <F3> Not used <F4> >> >	Return to <i>Main</i> menu. Select previous <i>Hand</i> sub menu (pusher). Not used in this display. Enter selected <i>Hand</i> sub menu (grip).
<F1> << > <F2> Open > <F3> Close > <F4> Not used	Return to previous display. Open the board grip. Close the board grip. Not used in this display.

Option menu

Option menu is used to load (recall) previously saved recipes or control width adjustment in a line equipped with automatic width adjustment. A recipe contains all magazine related settings made in *Setup* mode.

Select *Option* menu by pressing <F3> 'Opt' in *Main* menu.



Parameter/ <Button>	Description
<F1> << >	The first display view in <i>Hand</i> mode
<F2> Recipe >	Return to <i>Main</i> menu.
<F3> Autow >	Select <i>Load recipe</i> sub menu.
<F4> Not used	Select <i>Automatic width adjustment</i> sub menu.
<F1> << >	Not used in this display.
<F2> Not used	Not used in this display.
<F3> Not used	Not used in this display.
<F4> Load >	Load a previously saved recipe.
NNNNNmm	Use the numerical buttons and enter desired width in millimetres.
<F1> << >	Return to previous display.
<F2> Not used	Not used in this display.
<F3> Not used	Not used in this display.
<F4> Not used	Not used in this display.

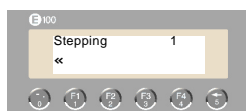
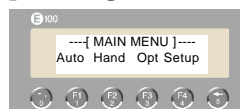
Setup mode

This mode is used to set up the machine for operation.

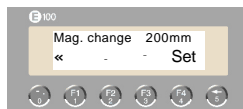
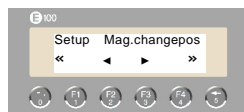
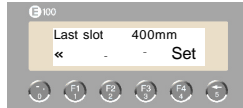
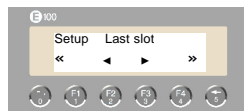
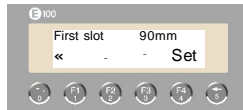
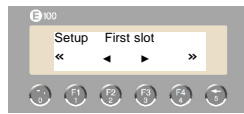
Password login is required to change most settings in *Setup* mode. Trying to modify a not modifiable parameter or to change a setting without entering correct *Password level* will generate the message "Access denied!" for a few seconds on the control panel.

Setup sub menus are described on the following pages.

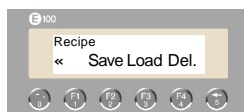
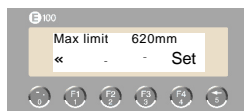
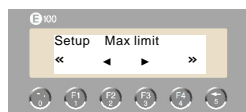
Select *Setup* mode by pressing <F4 Setup> in the *Main* menu.



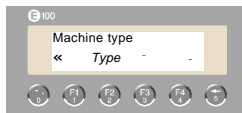
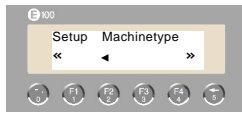
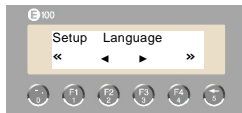
Parameter/ <Button>	Description
<F1 <> <F2> Not used <F3> ▶> <F4 >>	<u>Setup first display view.</u> This view is displayed when entering <i>Setup</i> mode. Return to <i>Main</i> menu. Not used in this display. Select next <i>Setup</i> sub menu. Enter selected <i>Setup</i> sub menu.
<F1 <> 0...50 Slots	Return to previous display. Total number of slots in the magazine. Required password level: 3
<F1 <> <F2> ◀> <F3> ▶> <F4 >>	Return to <i>Main</i> menu. Select previous <i>Setup</i> sub menu. Select next <i>Setup</i> sub menu. Enter selected <i>Setup</i> sub menu.
<F1 <> 1...9 Slots	Return to previous display. Number of cassette slots to move before next board is processed. A value of 2 will skip one slot between each board during cassette filling (Unloader/reloader) and emptying (Loader/Reloader). Required password level: 3



Parameter/ <Button>	Description
<p><F1 << >> <F2> ◀ ▶ <F3> ▶ ▶ <F4 >> >></p>	<p>Return to <i>Main</i> menu. Select previous <i>Setup</i> sub menu. Select next <i>Setup</i> sub menu. Enter selected <i>Setup</i> sub menu.</p>
<p><F1 << >> <F2> - > <F3> - > <F4 Set ></p>	<p>Return to previous display. Move the elevator unit upwards. Move the elevator unit downwards.</p> <p>Sets the current elevator unit level as the level of the first slot in the cassette that will be filled/emptied. If the uppermost cassette slot is set as first slot, cassette filling (Unloader)/emptying (Loader) will begin at that slot and proceed downwards. If the lowermost cassette slot is set as first slot, cassette filling (Unloader)/emptying (Loader) will begin at that slot and proceed upwards.</p>
<p>0...1000mm</p>	<p>Distance in millimetres, from home position to first slot. This value can be changed manually via the control panel. Do not press <F4 Set > after a manual change.</p> <p>Required password level: 3</p>
<p><F1 << >> <F2> ◀ ▶ <F3> ▶ ▶ <F4 >> >></p>	<p>Return to <i>Main</i> menu. Select previous <i>Setup</i> sub menu. Select next <i>Setup</i> sub menu. Enter selected <i>Setup</i> sub menu.</p>
<p><F1 << >> <F2> - > <F3> - > <F4 Set ></p>	<p>Return to previous display. Move the elevator unit upwards. Move the elevator unit downwards.</p> <p>Sets the current elevator unit level as the level of the last slot in the cassette that will be filled/emptied.</p>
<p>0...1000mm</p>	<p>Distance in millimetres, from home position to last slot. This value can be changed manually via the control panel. Do not press <F4 Set > after a manual change.</p> <p>Required password level: 3</p>
<p><F1 << >> <F2> ◀ ▶ <F3> ▶ ▶ <F4 >> >></p>	<p>Return to <i>Main</i> menu. Select previous <i>Setup</i> sub menu. Select next <i>Setup</i> sub menu. Enter selected <i>Setup</i> sub menu.</p>
<p><F1 << >> <F2> - > <F3> - > <F4 Set ></p>	<p>Return to previous display. Move the elevator unit upwards. Move the elevator unit downwards.</p> <p>Sets the current elevator unit level as the cassette change level. The cassette is automatically moved to this level when a cassette change is required.</p>
<p>0...1000mm</p>	<p>Distance in millimetres, from home position to cassette change level. This value can be changed manually via the control panel. Do not press <F4 Set > after a manual change.</p> <p>Required password level: 3</p>



Parameter/ <Button>	Description
<F1 << >> <F2> ◀ ▶ <F3> ▶ ▶ <F4 >> >>	Return to <i>Main</i> menu. Select previous <i>Setup</i> sub menu. Select next <i>Setup</i> sub menu. Enter selected <i>Setup</i> sub menu.
<F1 << >> <F2> - > <F3> - > <F4 Set >	Return to previous display. Move the elevator unit upwards. Move the elevator unit downwards. Sets the current elevator unit level as the maximum allowed travel distance for the elevator unit.
0...1000mm	Distance in millimetres, from home position to max limit. This value can be changed manually via the control panel. Do not press <F4 Set > after a manual change. Required password level: 5
<F1 << >> <F2> ◀ ▶ <F3> ▶ ▶ <F4 >> >>	Return to <i>Main</i> menu. Select previous <i>Setup</i> sub menu. Select next <i>Setup</i> sub menu. Enter selected <i>Setup</i> sub menu.
<F1 << >> <F2> Save > <F3> Load > <F4> Del. >	Return to previous display. Save current magazine settings as a recipe. Load a previously saved recipe. Delete a recipe. Following values are saved in the recipe: <ol style="list-style-type: none"> 1. Magazinesize (total number of slots in the magazine) 2. Stepping (number of slots to move before loading/unloading next pcb) 3. First slot (physical elevator level of the lowermost magazine slot) 4. Last slot (physical elevator level of the uppermost magazine slot) 5. Mag. change pos. (magazine change level)



<p><F1 <> <F2> ◀> <F3> ▶> <F4 >></p> <p><F1 <> <F2> ^> <F3> -> <F2> Not used</p> <p><i>Language</i></p>	<p>Return to <i>Main</i> menu. Select previous <i>Setup</i> sub menu. Select next <i>Setup</i> sub menu. Enter selected <i>Setup</i> sub menu.</p> <p>Return to previous display. Change language. Change language. Not used in this display view.</p> <p>Available languages are:</p> <ul style="list-style-type: none"> • English • Svenska • Spanish <p>Required password level: 1</p>
<p><F1 <> <F2> ◀> <F3> Not used <F4 >></p> <p><F1 <> <F2> Not used <F3> ^> <F4> -></p> <p><i>Type</i></p>	<p>Return to <i>Main</i> menu. Select previous <i>Setup</i> sub menu. Not used in this display view. Enter selected <i>Setup</i> sub menu.</p> <p>Return to previous display. Not used in this display view. Toggle machine type. Toggle machine type.</p> <p>Available machine types are:</p> <ul style="list-style-type: none"> • Loader • Unloader • Reloader <p>Required password level: 5</p>

Password

A password is required to change/view some of the settings under the *Setup* sub menu, and to manually move machine parts in *Hand* mode. A password is not required to operate the machine during production.

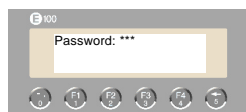
Automatic logout is made 5 minutes after login if no buttons are pressed on the control panel or if the power is switched off.

Password levels

Settings that require a password are assigned different password levels, depending on how critical the setting is.

Available password levels are:

- *Password 1.* User level 1. The password is "1" by default.
- *Password 2.* User level 2. The password is "2" by default.
- *Password 3.* Service level. The password is "3" by default.
- *Password 4.* Manufacturer level 1.
- *Password 5.* Manufacturer level 2.
- *Password 6.* Not used.
- *Password 7.* Not used.
- *Password 8.* Not used.



Parameter/ <Button>	Description
	<u>Password login view.</u>
<NUM> + <0...9>	Use the numerical buttons to enter password for desired security level and close with <Enter>. Return to <i>Setup</i> main view.
<F1 > < ı >	Close password login. The action taken depends on the following: - If no password is entered, this view is left without any action. - If wrong password is entered, it is deleted and a new password can be entered, or the view can be left by pressing <Enter> again. - If correct password for any security level is entered, the message "Level is..." will be displayed for a few seconds, showing the corresponding security level before the previous display view is shown again.

Alarms and messages

Alarms

An alarm that occurs in any mode is indicated with a buzzer sound (option), red warning light (option), and an alarm text on the control panel.

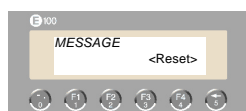
The alarm text remains on the control panel display until the alarm is reset by pressing <F4 Reset> or <Enter>, or the power is turned off.

Messages

Some events cause messages to be shown on the control panel display, but no alarm is generated. The message text remains on the control panel until it is reset by pressing <F4 Reset> or <Enter>, or the power is turned off.

Alarm and message table

The table below contains the alarms and messages that can be shown on the control panel.



Message/ <Button>	Description
<F4 Reset >	Press <F4 Reset> for reset and return to previous display view.
< ı >	Press <Enter> for reset and return to <i>Main</i> menu.
MESSAGE	See alternatives below.
<i>Access denied!</i> Cause:	Trying to modify a not modifiable parameter or to change a setting without entering correct <i>Password</i> level will generate this message for a few seconds on the control panel.
Action:	Enter a valid password before changing parameters.
<i>PLC not running!</i> Cause:	The PLC is in programming mode.
Action:	Flip the Stop/Run-switch on the PLC to Run position.
<i>Emergency stop!</i> Cause:	The emergency stop button is pressed down.
Action:	Pull up the emergency stop button. Restart the machine.
<i>Encoder alarm!</i> Cause:	The PLC is unable to interpret the position encoder signals, or, the PLC does not receive any position encoder signals within 0,3 seconds from elevator motor start.
Action:	Replace the elevator motor.

<p><i>Grip alarm!</i></p> <p>Cause:</p> <p>Action Unloader:</p> <p>Action Reloader:</p>	<p>(Unloader/Reloader only)</p> <p>The "board grip sensor" was not activated during the entire retraction.</p> <ol style="list-style-type: none"> 1. The Unloader/Reloader is not correctly aligned to the previous machine. 2. The board magazine is skewed. 3. The "board release sensor" is broken or not correctly adjusted. 4. Magazine levels are incorrectly configured. 5. Warped boards. 6. Conveyor speed is too high on the preceding machine, causing the board to "bounce" out of the grip. 7. Low or no air pressure. <p>Remove the jammed or partially retracted board, reset alarm and start production (Auto mode) again.</p> <p>Manually push the jammed or partially retracted board into the magazine, reset alarm and start production (Auto mode) again.</p>
<p><i>Error board transfer!</i></p> <p>Cause:</p> <p>Action Unloader:</p> <p>Action Reloader:</p>	<p>The Loader/Unloader/Reloader and the preceding/following machine did not complete a board transfer within 20 seconds.</p> <p>Unloader/Reloader:</p> <ol style="list-style-type: none"> 1. The board grip sensor was not activated. 2. The "pusher home sensor" is broken or not correctly adjusted. 3. Low or no air pressure. <p>Loader/Reloader:</p> <ol style="list-style-type: none"> 1. Low or no air pressure. 2. The "pusher out sensor" is broken or not correctly adjusted. <p>Remove the jammed or partially retracted board, reset alarm and start production (Auto mode) again.</p> <p>Manually push the jammed or partially retracted board into the magazine, reset alarm and start production (Auto mode) again.</p>
<p><i>Close the door!</i></p> <p>Cause:</p> <p>Action:</p>	<p>The magazine door was opened during elevator movement, or an attempt to start production (Auto mode) was made when the magazine door was open. This alarm is only valid on machines equipped with elevator cover.</p> <p>Close the door, reset alarm and start production (Auto mode) again.</p>
<p><i>Board jam!</i></p> <p>Cause:</p> <p>Action:</p>	<p>A board is blocking the board jam sensor, and a manual or automatic elevator movement was requested. This alarm is only valid on machines equipped with a board jam sensor.</p> <p>Remove the jammed board, reset alarm and start production (Auto mode) again.</p>
<p><i>Elevator limit</i></p> <p>Cause:</p> <p>Action:</p>	<p>The elevator has reached the maximum allowed (software) distance away from the home position sensor.</p> <p>Shut down the machine at the main switch, back on again, and perform the prompted home positioning.</p>

Signal tower

The machine can be equipped with a signal tower (option), positioned above the control cabinet.

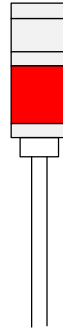


Figure 3-3 Signal tower

Buzzer

A built-in buzzer is on when an alarm is active. The buzzer is reset by pressing <F4 Reset> or <Enter> when an alarm message is shown on the control panel.

Red light

Red light indicates active alarm. The red light may also be lit shortly during start-up and shutdown.

4. Operation Setup

Setting up the machine for operation

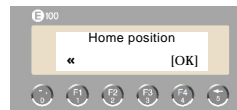
The setup procedures in this chapter are intended to be performed in a continuous sequence. Therefore, the activity numbering is made consecutively throughout the chapter.

Pusher Arm Position

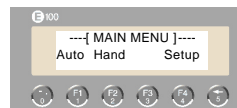
1. Set the pusher arm horizontal position by loosening the hand wheel and adjust the pusher arm sideways to touch the PCBs in the centre.
2. When ready, tighten the hand wheel.

Starting Up

3. Switch on the machine with the main power switch.
4. Press <F4 'OK'> to start a home positioning of the elevator unit. The elevator unit will then search for the home position sensor located near its physical uppermost position.



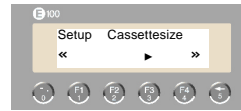
5. Select *Setup* mode by pressing <F4 'Setup'> in the *Main* menu.



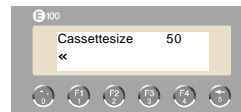
Setting the Cassette Size

The Cassette size is the total number of slots in the cassette.

6. Press <F4 >>> to enter *Cassettesize* sub menu.



7. Type in a new value and press <Enter>. The new value is automatically saved in the PLC memory. Instructions on how to use the numerical buttons are found on page 13.



8. Press <F1 <<> to go back to the previous screen.

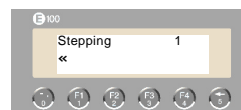
Setting the step value

The step value determines how many slots the cassette is moved before accepting (Unloader)/pushing out (Loader) a new board.

9. Press <F4 >>> to enter *Stepping* sub menu.



10. Type in a new value and press <Enter>.



11. Press <F1 <<> to go back to the previous screen.

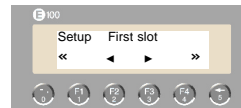
Setting first slot level

First slot level is the level of the first slot in the cassette that will be filled/emptied.

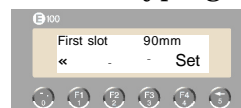
If the uppermost cassette slot is set as first slot, cassette filling (Unloader)/emptying (Loader) will begin at that slot and proceed downwards.

If the lowermost cassette slot is set as first slot, cassette filling (Unloader)/emptying (Loader) will begin at that slot and proceed upwards.

12. Press <F4 >> to enter *First slot* sub menu.



13. Use <F2> -> and <F3> -> buttons to move the elevator to desired level and press <F4> Set>, or type in a new value using the numerical buttons and press <Enter>. By modifying the value, you can make fine adjustments of the level. Instructions on how to use the numerical buttons are found on page 13. Do not press <F4> Set> after typing in a new value.

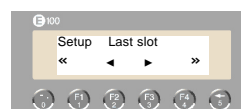


14. Press <F1 <<> to go back to the previous screen.

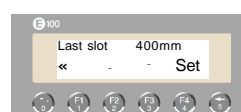
Setting last slot level

Last slot level is the level of the last slot in the cassette that will be filled/emptied.

15. Press <F4 >> to enter *Last slot* sub menu.



16. Use <F2> -> and <F3> -> buttons to move the elevator to desired level and press <F4> Set>, or type in a new value using the numerical buttons and press <Enter>. By modifying the value, you can make fine adjustments of the level. Do not press <F4> Set> after typing in a new value.

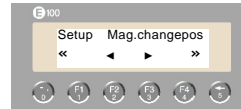


17. Press <F1 <<> to go back to the previous screen.

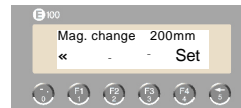
Setting cassette change position

Cassette change position is the desired level where cassette changing is done. The cassette is automatically moved to this level when a cassette change is required.

18. Press <F4 >>> to enter *Cassette change position* sub menu.



19. Use <F2> -> and <F3> -> buttons to move the elevator to desired level and press <F4> Set>, or type in a new value using the numerical buttons and press <Enter>. By modifying the value, you can make fine adjustments of the level. Do not press <F4> Set> after typing in a new value.



20. Press <F1 <<> to go back to the previous screen.

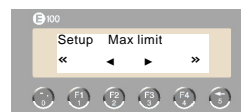
Setting max. limit

Max. limit is the maximum allowed moving distance (stroke length) for the elevator unit. The distance is measured from the home position.

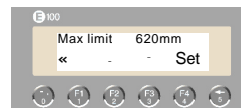


*Max. limit is always set at the manufacturer.
A manufacturer password is required to change it as an incorrect distance can cause machine damage.*

21. Press <F4 >>> to enter *Max. limit* sub menu.



22. Use <F2> -> and <F3> -> buttons to move the elevator to desired level and press <F4> Set>, or type in a new value using the numerical buttons and press <Enter>.



23. Press <F1 <<> to go back to the previous screen.

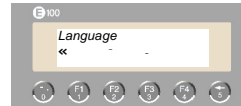
Setting the menu language

The language used in the operators panel can be changed. Available languages are: English, Svenska, and Suomi.

24. Press <F4 >> to enter *Language* sub menu.



25. Press <F2> -> or <F3> -> until desired language is shown.



26. Press <F1 <<> to go back to the previous screen.

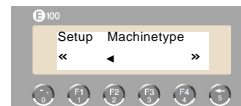
Setting machinetype

The control software for the Loader, Unloader, and Reloader is the same. Available machinetypes are: Loader, Unloader, Reloader.

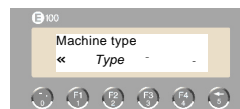


Machinetype is always set at the manufacturer. A manufacturer password is required to change it.

27. Press <F4 >> to enter *Machinetype* sub menu.



28. Press <F3> -> or <F4> -> until desired machine type is shown. Available types are: Loader, Unloader, and Reloader.



29. Press <F1 <<> twice to go back to *Main* menu.

Finishing the Setup

The operation setup is now completed. Set the machine in production mode as described in the section *Automatic mode*, in Chapter 3, page 14.



The machine contains moving parts that can cause damage and personal injury, if handled incorrectly. Read the safety instructions in Chapter 1, Safety.

5. Maintenance

The maintenance instructions in this chapter comprise weekly, monthly and six month maintenance for the machine.

The maintenance is very important for a continuous operation without unintentional stops.

Follow the maintenance instructions carefully and keep the machine clean.

Lubricants

Unless other is stated, use the OKS 270 grease.

Grease should be applied in small amounts, just to give a thin film.

Specifications and part #'s for the lubricants are found in the end of this chapter.

Weekly

Clean the machine.

Clean the machine all over.

Monthly

Lubricate elevator lead screw.

Apply grease to the whole length of the lead screw.

Six month

Lubricate elevator guides.

Apply a small amount of grease to the whole length of the two guides.

Lubricate pusher guide.

Apply a small amount of grease to the whole length, and both sides of the pusher guide.

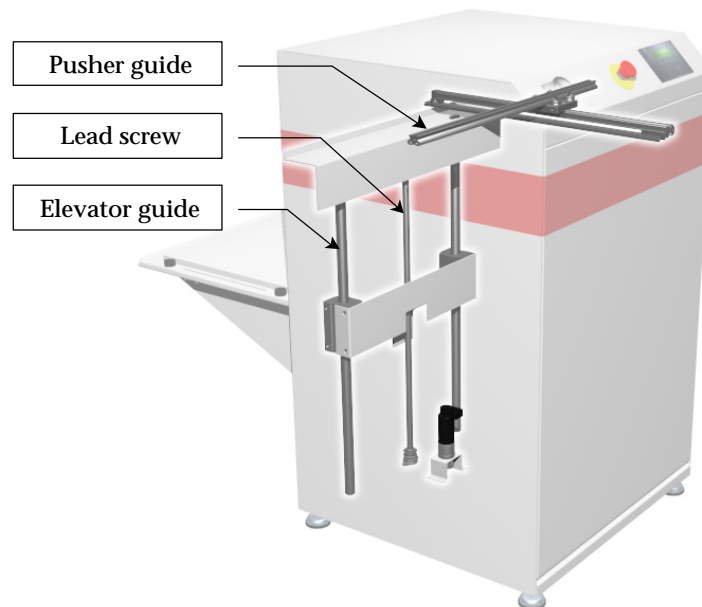


Figure 5-1 Lubrication

Lubricant specifications

This section contains lubricant data for:

- OKS 270 grease
- Esso Grease LT2

OKS 270

OKS 270 is the base lubrication grease for the machine.

Data

Full product name: OKS 270

Type: Grease paste

Colour: Whitish

Flash point: >210°C

Supplier in Sweden

TriboTec AB

Box 203

S-435 24 Mölnlycke, Sweden

Phone: Nat. 031-88 78 80 Int. +46 31 78 80

www.tribotec.se

Manufacturer

OKS Spezialschmierstoffe GmbH

Triebstraße 9

D-80993 München

Phone: Nat. 089-14 98 920 Int. +49 89 14 98 920

www.oks-germany.com

Alvania EP (LF) 2

Alvania EP (LF) 2 is the lubrication grease for the elevator linear unit.

Data

Full product name: Shell Alvania EP (LF) 2

Type: Grease paste

Workingtemp: -20/+120

Supplier in Sweden

Shell

Phone: Nat. 020-27 10 00 Int. +46 20-27 10 00

www.shell.com