XN running iPC

User manual

11 - 2014 | XN

ESKO

Contents

1. Preface

User Manual
for
Kongsberg XN
running **iPC**

Note: We remind you that only the Esko staff, or persons having received appropriate training, are allowed to handle, manipulate or do repairs on the system.

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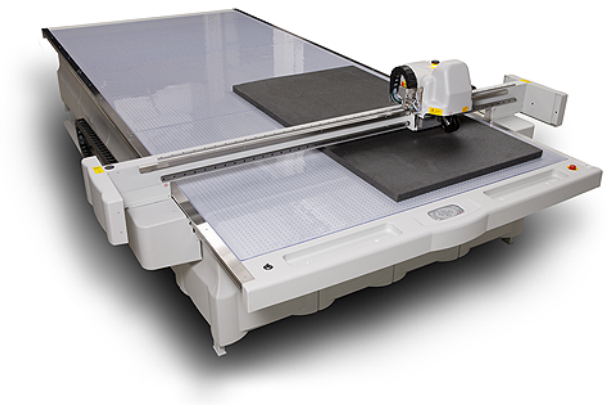
2. Change Record

Date dd-mm-yy	By	Description
06-10-2014	jhbe	First edition of this document

3. Welcome



Welcome to the **User Manual for Kongsberg XN running iPC**.

This manual will provide a complete and detailed description of cutting table functions.

There is a separate user manual for i-cut Production Console (iPC). Thus, actual GUI functions will be referenced in this manual, but the complete and comprehensive description is available in the **iPC User Manual**.

This manual is aimed for operators of **Kongsberg Cutting Tables** and people preparing files for such equipment.

Note: Some of the functions and equipments described in this manual are optional.

4. Using this manual

4.1 Main Sections

The manual is divided into the following **Main Sections**:

Safety Regulations

- All safety related issues are discussed.

System Description

- This chapter provides basic knowledge about the machine.

Basic Operations

- This chapter provides basic knowledge about how to operate the machine.

Prepare for a Job

- A typical workflow is described, with detailed information about each step.

How to Procedures, Advanced

Optional functions for the advanced user:

- **Cutting Thick Materials** - advices.
- **Hard Board Production** - advices
- **Multi Pass Milling** - how to.

Tool Configuration and Adjustment

- General information about the tooling and adjustment of tools.

Tooling System

- Tool descriptions.

Maintenance

- This chapter describes maintenance to be carried out by the customer.

Fuse Replacement

- Fuse location and specification.

Appendices

- *Roll Feeder* - basic information.
- *Vacuum Cleaner* - basic information.
- *FAQ* - Frequently Asked Questions

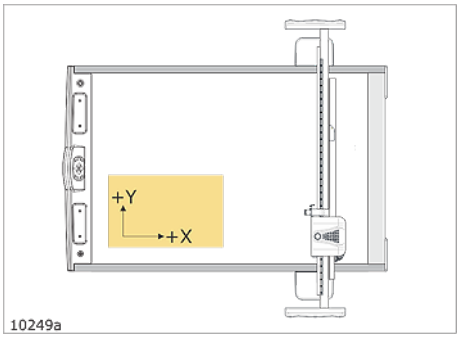
4.2 Name Styles and Symbols

Name or style	Description
Pop-up dialog	This is the dialog that appears when you click the Right mouse button.
Start button	The italic style indicates this is a button on the Operator panel.
OK	The bold style indicates this is a button or function in the GUI.
Maintenance	Link to topic.
Options->System Option	Menu selection: From the **Options** menu, select **System Option**.
HW	This symbol indicates that the function depends upon actual hardware. If hardware is not available, this functions is hidden.
	This symbol indicates that the function is license dependant.

4.3 Pictures and Illustrations

Orientation

Pictures and illustrations related to the **Cutting Table** are viewed as illustated here:



4.4 Local Languages

This manual is available in a wide range of local languages.

Screen pictures and illustrations remains in English language.

5. Safety Regulations

5.1 Introduction

The XN table is designed to conform to **Safety Regulation** standards.

Nevertheless, operating the table can involve hazards if:

- The operator does not follow the **Operating Instructions**.
- The table is used for non-intended purposes.

In addition to the **Safety Regulation** described below, you will find safety warnings in the respective topics.

5.2 Responsibilities

5.2.1 The Manufacturer

The Manufacturer is responsible for delivering the system according to **Safety Regulation** standards.

5.2.2 The Customer

The Customer is responsible for:

- Ensuring that the system is used for it's intended use only
- Allowing that only authorized and trained personnel operate the system
- Preventive maintenance as described in the Maintenance chapter.
- That the local regulations regarding installation and operation are fulfilled.

5.2.3 The Operators

The Operators are responsible for:

- Operating the system only when it is in a flawless state.
- Operating the system according to **Operating Instructions**.
- Ensuring that no **Unauthorized Personnel** come close to the system.

5.3 Requirements to be met by operators

Personnel operating the system must:

- Be adequately trained.
- Have read and understood the instructions described in **Safety Regulation** as well as any other safety warnings.

5.4 Definition of use

Intended use is described in the **iPC User Manual**.

In this manual, intended use is described in the following chapters:

- *Basic Operations*
- *Prepare for a Job*
- *How to Procedures, Advanced*

Any other use is considered **non-intended use**.

Examples of **non-intended use**:

- Operation by operators not meeting the requirements as described above.
- Unauthorized modifications (bridging safety devices, removing covers etc.)
- Utilizing accessories other than those specified by Esko.

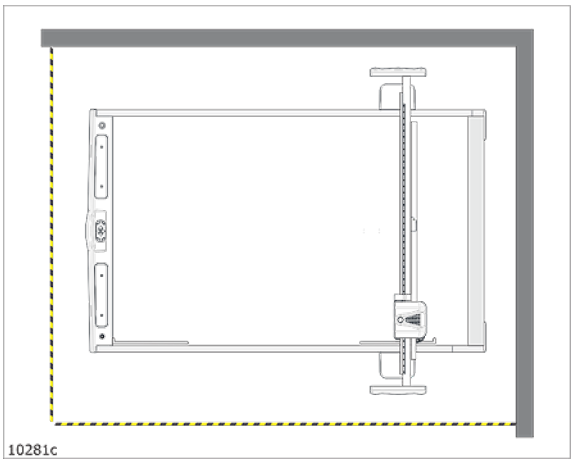
Non-intended use may cause:

- Health hazards and injuries.
- Damage to the system.
- Incorrect functionality.
- Damage to work materials.

Note: Esko is not liable for any damage resulting from such non-intended use.

5.5 Danger Zones

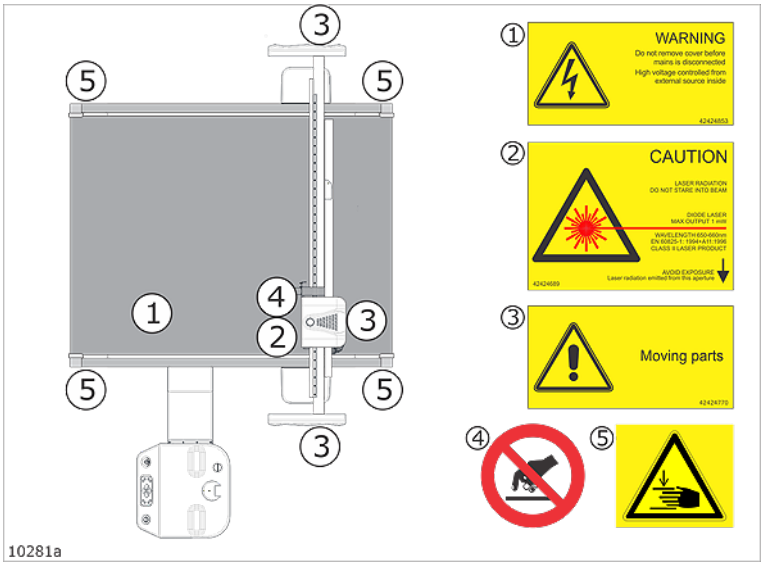
5.5.1 Danger Zones



The area around the moving parts is considered to be a **Danger Zone**.

The **Danger Zone** is identified by the means of a yellow / black floor marking.

5.5.2 Moving Parts, Laser Radiation and High Voltage



5.5.3 Loose Clothing

While working with this machine, do not:

- Use ties
- Use loose necklaces
- Use scarfs

5.5.4 Noise Level

- **Hearing Protection** should be used by any personnel exposed to the noise from the machine.

5.5.5 Ejection of Parts

Potential risk when running MultiCUT:

Personnel hit by breaking milling bit or small pieces of processed material.

- **Eye Protection** should be used by any personnel working with **MultiCUT**.

5.6 Warning Sign Explanation

Knife Blades are extremely sharp.

This symbol is used in this documentation to indicate operations with **Knife Blades** and **Milling Bits**.

Hand Squeeze

Potential areas with a risk of being squeezed are marked with the **Hand Squeeze** sign.

These areas are:

- Between X-axis end stopper and traverse wagon.

Do not Touch

Potential areas with a risk of being squeezed are marked with the **Do Not Touch** sign.

These areas are:

- Between Y carriage and rack
- Between the table top and the moving traverse.
- Underneath the tool head.

Hearing Protection

The **Hearing Protection** symbol indicates areas where the use of hearing protection is compulsory.

Eye Protection

The **Eye Protection** symbol indicates areas where the use of eye protection is compulsory.

Moving Parts

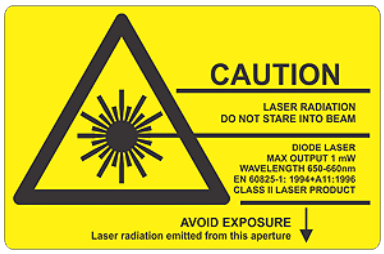
Potential areas with a risk of being hit by **Moving Parts** are marked with the **Moving Parts** sign.

These areas are:

- Both traverse ends.
- Y carriage.
- Tool head(s).

The **Main Power Unit** (MPU) contains **Mains Voltage** and may be opened by **Authorized Personnel** only.

The MPU is marked with the **High Voltage** warning sign.



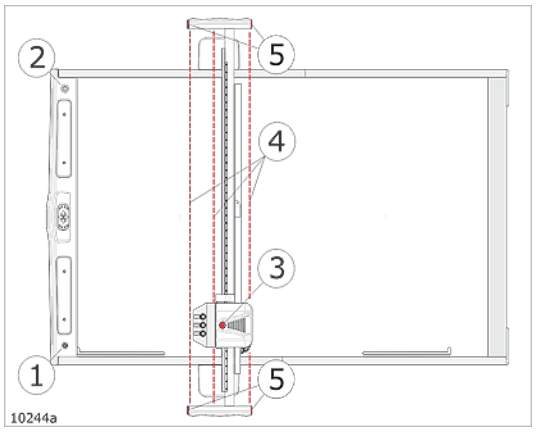
Laser Radiation.

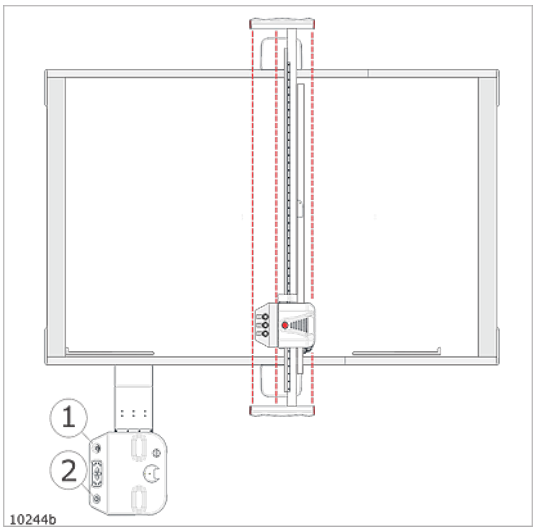
The tool head is equipped with a class II **Laser Pointer**.

Avoid laser light into your eyes.

5.7 Safety devices

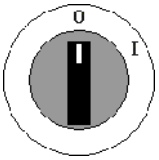
5.7.1 Overview





Device no	Description
1	**Main Power Switch**
2	**Emergency Stop Button**
3	**Warning Lamp**
4	**Photo cell supervision**
5	**Dynaguard**

5.7.2 Main Power Switch



The **Main Power Switch** turns power to the table on/off.

5.7.3 Emergency Stop Button

When pushed, the **Emergency Stop Button** turns off all **Servo Power**.

Note:

Activating the **Emergency Stop Button** does not provide a guarantee against injury!

Due to the high kinetic energy of moving parts, do not underestimate **Stopping Distances** of traverse, Y carriage and Tool Head.

5.7.4 Warning Lamp on top of Y Carriage

Light is	Description
Off	**Servo Power** is off
On	**Servo Power** is on, **Safety System** is enabled, table is in operation
Flashing	**Safety System** is activated. **Reset Safety System** to continue operation

5.7.5 DynaGuard Safety System

The **DynaGuard Safety System** consists of two light beams in front of the traverse and two behind. In addition, there is a stop mechanism mounted on each end of the traverse.

Machine movement will stop and **Servo Power** will be switched off if:

- One of the light beams is broken.

- The stop mechanism is activated, for instance when a person is standing too near the table.

5.8 Protective equipment

For the operator(s), Esko recommends the following **Protective Equipment**:

Close-fitting clothes to avoid being caught by the beam or the tool head which can cause injuries.

Gloves to protect against cuts from materials with sharp edges.

Eye protection should be used by any personnel working with milling.

Always use **Hearing Protection** when working with the machine for a longer period of time.

The acoustic noise level will vary with the type of operation and tooling, but a typical average level is 78.5 – 83.5 dBA and a maximum level of 98.5 dBA.

5.9 Procedures in case of malfunctions

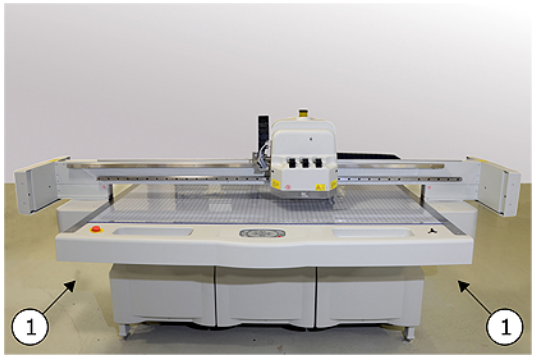
Trouble-shooting and repair shall be executed by **Authorized Personnel** only.

Contact the **Esko Service Organization**.

5.10 Residual Risk, XN

Despite all safety protection means incorporated in this machine, there are some **Residual Safety Risks** to be aware of:

Beneath traverse end



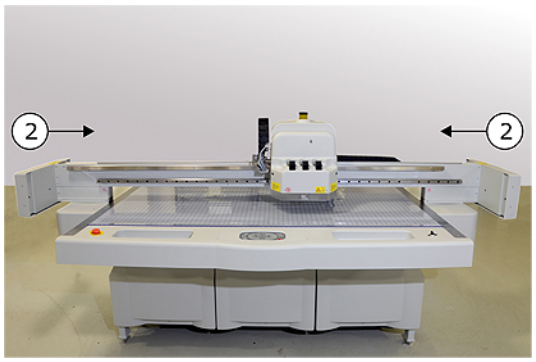
1

The low part of the traverse ends is un-protected.

Actions:

- Children are not supposed to be in the machine area.
- Do not work or stay beneath the traverse while the machine is working.

Y-carriage



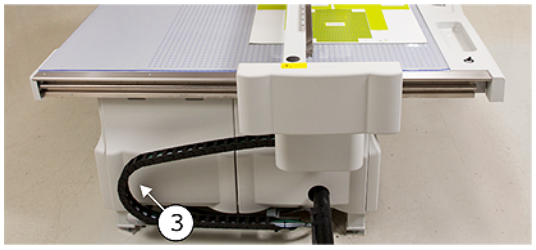
2

The top of the Y-carriage is un-protected in all four directions.

Actions:

- Do not bend down over the table or traverse while the machine is working.

Inside cable chain



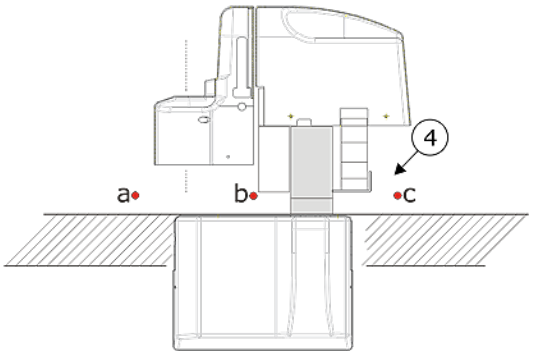
3

There is a risk for squeezing between the cable chain and the table base frame.

Actions:

- Stay out of this area while the machine is working.

Rear side of traverse



4

The **DynaGuard Safety System** photo cell beam c will stop the movement when hit.

When the **Feeder Paws** are mounted, the distance between beam c and the mechanics is reduced.

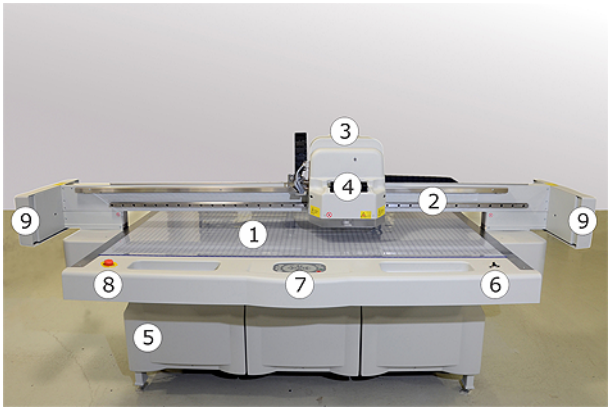
Actions:

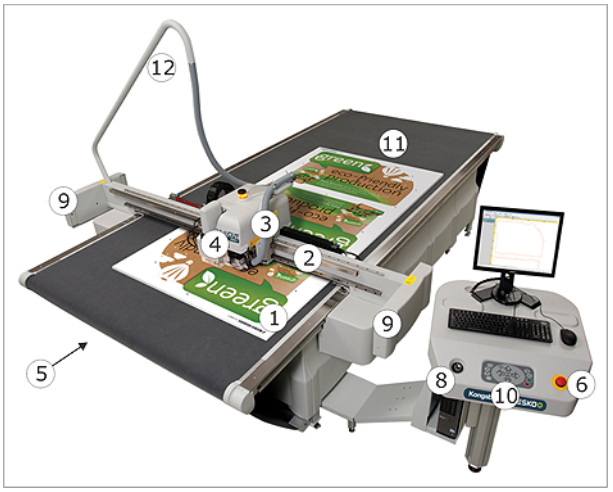
- Stay out of this area while the machine is working.

6. System Description

6.1 Naming conventions

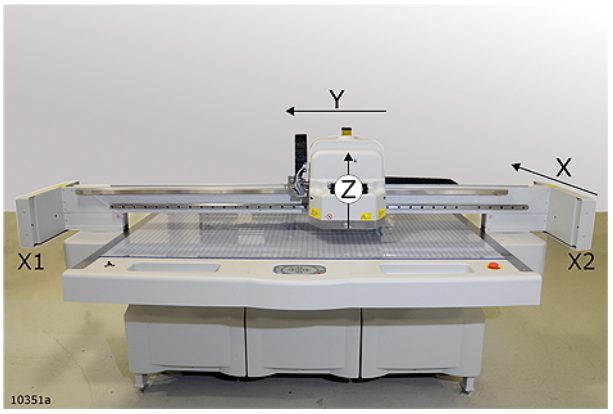
Machine





1 **Cutting Table**	7 **Operator Panel**
2 **Traverse**	8 **Main Power** on/off switch
3 **Y carriage**	9 Traverse Safety Stop switches (**DynaGuard**)
4 **Tools**	10 **Operator Station**
5 **Main Power Unit** (MPU), **Air Pressure Regulator**	11 **Conveyor belt**
6 **Emergency Stop** button	12 **Gallows for MultiCUT**

Axes

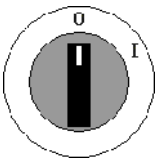


X - **X-axis**
Y - **Y-axis**

X1 - X1 end of traverse
X2 - X2 end of traverse
Z - **Z-axis**.

The arrows indicates positive moving direction.

6.2 Main Power Switch



Switch positions:

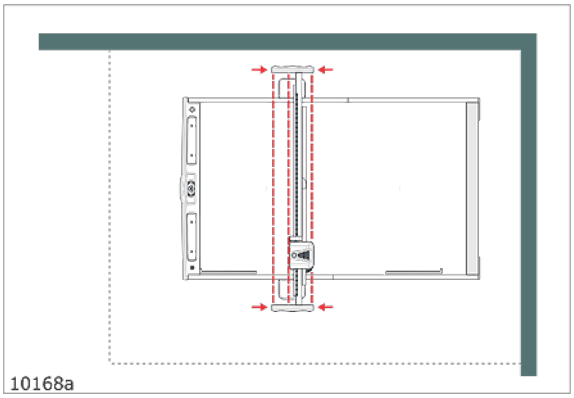
O - the **Main Power** to the machine is switched OFF.
I - the **Main Power** to the machine is switched ON.

6.3 Emergency Stop Button

Switch positions:

OUT - **Emergency Stop** is switched OFF.
IN - **Emergency Stop** is switched ON; **Servo Power** to the machine is switched off.

6.4 DynaGuard



DynaGuard Safety System

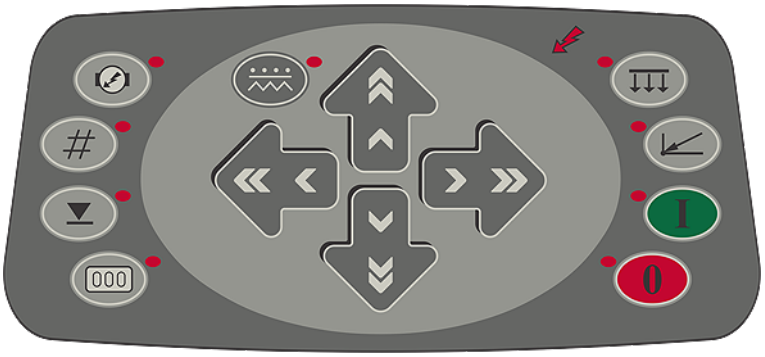
When **DynaGuard** is triggered, **Servo Power** to the machine is switched off.

Continue after DynaGuard is triggered

To continue operation, proceed as follows:

1. Ensure the table is free from obstructions and ready for operation.
2. Reset the **Safety System** by pressing the ***Stop*** pushbutton.
3. Observe that **Servo Power** is switched on,
4. Press ***Start*** to continue.

6.5 Operators Panel



Power On

	**Mains Power** on/off indication.

Servo Power On

	**Servo Power** on/off control.

Start

	Press this button to **Start Operation**.

Stop / Safety System Reset

	Press this button to ***Stop Operation*** and ***Reset Safety System***.

Vacuum On/Off

	Press this button to switch **Vacuum On/Off**. Provides material hold down.

Init / Set Panel Reference Point

	Press this button to: • Initialize the system, i.e. give variables pre-set values. • Set **Panel Reference Point**. If **Fixed Reference Point** is disabled, the current position of the **Laser Pointer** is set as the new **Reference Point**.

Table Zero / Forced Tool Height Measure

	**Home Function** Press this button, then the ***Start*** button, to move the tool head to **Selected Reference Point**. The **Table Zero Mode** is automatically selected at Power on. The system remains in the **Table Zero Mode** until the **Home Function** is completed. If **Forced Tool Height Measuring** mode is enabled, this button will start a **Tool Height Measuring Sequence**. For more information, see (jhbe)

Jog buttons

	Press the Jog buttons to move the tool head in the desired direction. The system must be in **Stop** mode, i.e. the ***Stop*** button must be lit, for these buttons to be operative. Note: It is possible to configure the jog direction, see Option->System setup.

Incremental Jog / Forced tool height measure

	Press this button to select the **Incremental jog** / **Forced tool height measuring** mode. Press the button a second time to disable the **Incremental jog** / **Forced tool height measuring** mode. For information about **Forced tool height measure**, see (38).
	Press the two arrows to move the tool head a large step. Press the single arrow to move the tool head a small step. The size of the incremental movement can be changed from Option-> System setup.

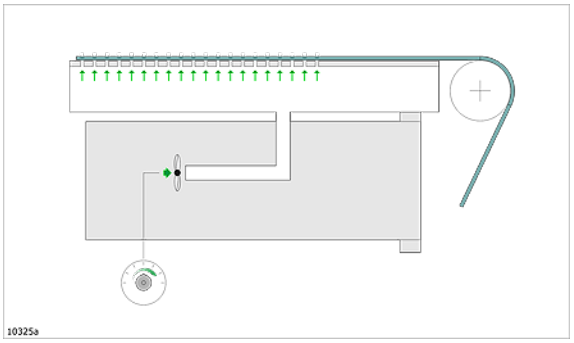
Tool Down

	Press the ***Tool Down*** button to manually operate the machine with a tool in the down position. Cancel by pressing ***Tool Down*** a second time.

Vacuum release mode

	For details about this function, see separate chapter 'Vacuum control'. If activated for more than 2 seconds, this button activates the **Manual Belt Clamp** function.

6.6 Variable Blow Back



For conveyor belt::

The **Blow Back** function creates an air pillow below the conveyor belt in order to reduce belt friction.

For material handling:

The **Blow Back** function creates an air pillow below the material in order to ease handling.

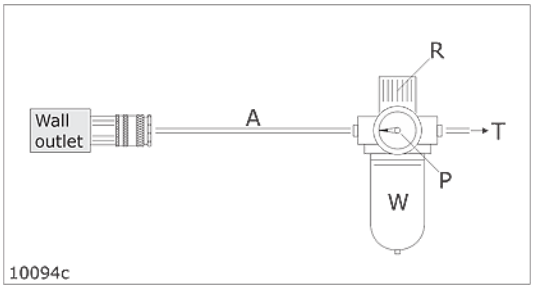
Variable Blow Back - adjust the air flow to a suitable level for the actual material.

Use this function to manually enable **Blow Back**.

6.7 Pressurized Air system

General

The **High Pressure Air System** supplies the valves and tooling with compressed air.



The compressed air input is connected to a combined **Pressure Regulator Valve/Water Trap**.

Wall Outlet - Wall Outlet

A - Air Tube

R - Pressure Regulator Valve

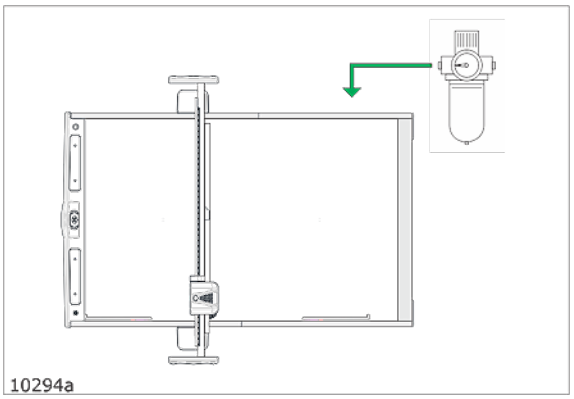
P - Pressure Gauge

W - Water Trap

T - Air Tube to Tools and Valves

For details regarding air supply requirements, see **Site Preparation Manual**.

Air Pressure Regulator settings



The **Air Pressure** should be adjusted to minimum 6 bar (6 kg/cm2, 6*105 Pa).

Recommended pressure level is 7 bar (7 kg/cm2, 7*105 Pa).

6.8 Application programs available

After installation of iPC, the following application programs are available

iPC

Control program for the **Cutting Table**.

For more information, see **iPC User manual**.

SysLoad

Program for download of updates to **CU–modules**.

HWT800

Hardware test program, see separate **HWT800 User Manual**.

7. Basic Operations

Keep away from **Moving Parts** during operation.

Do not lean on **Racks**, **Guide Ways** or **Traverse** during operation, as this may cause personal injury.

Before starting any operation, make sure that:

- The Table is free from obstructions
- No unauthorized personnel come close to the table

7.1 Introduction

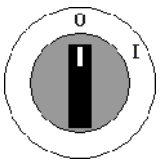
All procedures for how to run the machine are based upon the following assumptions:

- The **User Interface** is up and running.
- The actual **Tools** are properly mounted and adjusted.

7.2 Power On Sequence

Ensure the table is free from obstructions and ready for operation.

Follow these steps to power up the system and get ready to work:

1	**Front End PC** Switch on the PC and the monitor.
2 	**Table Power** Switch the table on using the **Main Power Switch**. Note: After power off, wait minimum 5 sec. before the system is switched on again.
3 	**iPC** From Desktop, double-click the icon for **iPC** Check that no error message indicates faulty conditions.
4	**Safety System**

Reset the **Safety System** by pressing the ***Stop*** pushbutton.

5 **Servo Power**

Press the ***Servo On*** pushbutton.

The **Warning Lamp** on top of the Y carriage should be on without flashing.

6 **Table Zero Sequence**

Press ***Start*** pushbutton to complete the **Table Zero Sequence**.

The machine will move to the **Selected Reference Point**.

7 **The table is now ready for operation.**

7.3 Reset Safety System

Press ***Stop*** to **Reset Safety System**.

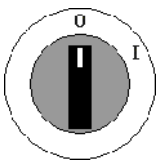
7.4 Power Off Sequence

Follow these steps to power down the system:

1 **Servo Power**

Press the ***Servo On*** pushbutton to switch **Servo Off**.

2 **Table Power**



Turn **Table Power** off using the ***Main Power Switch***.

Note: After power off, wait minimum 5 sec. before the system is switched on again.

3 **Front End PC**

To switch off the PC, use the **Operating System** shutdown procedure..

7.5 Continue after Safety Break

If the **Safety System** is activated, all movements on the table are stopped and the **Warning Lamp** starts flashing.

To continue operation, proceed as follows:

1	Ensure the table is free from obstructions and ready for operation.
2 	Reset the **Safety System** by pressing the ***Stop*** pushbutton.
3 	The **Warning Lamp** on top of the Y carriage should be on without flashing. Observe that **Servo Power** is switched on,
4 	Press ***Start*** to continue.

8. Prepare for a Job

8.1 Introduction

Keep away from **Moving Parts** during operation.

Do not lean on **Racks**, **Guide Ways** or **Traverse** during operation, as this may cause personal injury.

Before starting any operation, make sure that:

- The cutting table is free from obstructions.
- No unauthorized personnel come close to the table.

The **Starting Point** in this procedure is:

- iPC and table are up and running.
- Properly adjusted tools are mounted.

Note: Recommended tooling is described in **Esko Tooling Guide**.

Follow these steps to prepare for a job:

1 File preparation

- In the **iPC User Manual**, follow the steps described in the Work Flow - chapter, from **File Open** to **Ready for Production**.
- Verify that the display of the job in **Table View** is reasonable.

2 Select Vacuum Sections

	**Main Menu->Machine->Vacuum Sections**
	**Machine Panel Toolbar->Vacuum Sections**

From the **Vacuum Section** setup – dialog, configure a suitable vacuum area for the job.

Select **Vacuum Sections** that corresponds to the outline of your material.

Proper selection is important to achieve the best possible material hold down.

3 Table Top Reference

	**Main Menu->Machine->Table Top Reference**
	**Machine Panel Toolbar**->**Table Top Reference**

Use this function to update table top level measurement in current **Laser Pointer** position.

Measure on top of **Cutting Underlay**; no material.

4 Adjust Tool Height

	**Main Menu->Machine->Adjust Tool Height**
	**Machine Panel Toolbar**->**Tool Height**

Complete the tool height adjustment wizard.

5 Speed setting

	**Selected Job**->**Production Setup**->**Quality**

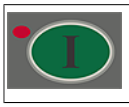
Select a proper speed setting in the range between **High Quality** and **High Speed**.

When selecting **High Speed**, less accuracy is a possible consequence.

6 Vacuum on

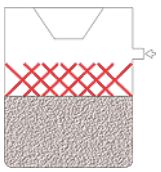
	Press **Vacuum On** to start the vacuum pump.

7 Start

	Press **Start** to execute the job.

8.2 Milling Production

Before execution, check vacuum cleaner:



Ensure the vacuum cleaner container is prepared for the actual job.

Empty the container regularly.

Recommended tooling is described in **Esko Tooling Guide**.

Note: Milling Jobs should be executed in **High Quality** mode.

8.3 Make a Pen Plot

Follow the procedure for how to prepare for and execute a job.

Ensure the **Ballpoint Pen** is clean and ready to use.

8.4 Work with X-pad

Measuring modes

	**Machine Connection**->**Machine Configuration**->**Setup**

Two modes are available:

Manual

Tool height is manually adjusted, using the tool height adjustment wizards available from the **Tool Configuration** dialog.

Automatic

The tool height is automatically measured, using X-pad as described in next chapter.

Automatic tool height measurement using X-pad

Measure all tools, started from GUI, procedure

	**Main Menu->Machine->Adjust Tool Height**
	**Machine Panel Toolbar**->**Tool Height**

- A wizard dialog appears.
- Follow the instructions in the wizard to complete calibration.

Measure all tools, started from Operators panel, procedure

1 	• Press the Stop button for more than 2 sec.
2	• While the *Stop* button is down, press the *Tool override down* button • Release both buttons.

- The measuring sequence is started.

3

- Place the measuring pad with the laser in center or jog the machine until the laser is in the middle of the measuring pad.
- Press *Start* to initiate measuring.

Indication that the measuring sequence is active

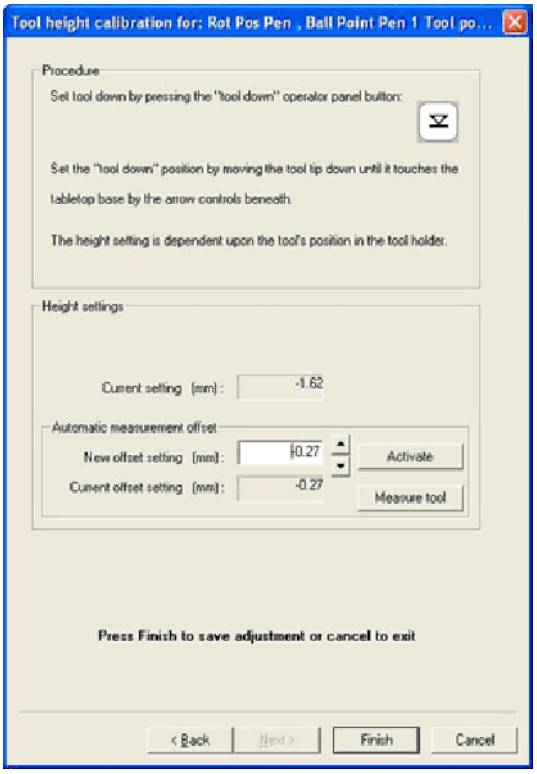
A measuring sequence is indicated by:

- Continuous light in the *Tool override down* button.
- Continuous light in the laser pointer.
- Start button light is flashing.
- Stop button light is off.

Measure one tool, procedure

Machine Connection->Tool Configuration

- From the dialog, select the tool to be measured.
- Select **Adjust active tool**.
- Select **Tool height calibration**.
- A wizard dialog appears:



- Press the **Measure tool** button.
- A wizard dialog appears.
- Follow the instructions in the wizard to complete calibration.
- **Height settings**

  Current setting (): The automatically measured height value.

- **Automatic measurement adjustment**

  New offset setting ():

  Use this value to modify the height measured by the Measuring pad. Negative value means down into the material.

  Current offset setting ():

  The initial offset value (when the dialog was opened) is displayed.

How to start a measuring sequence in the middle of a job

Two methods are available:

1. Measure after **Stop at tool select** (Stop before use). The execution will stop for each tool change and a tool height measuring sequence can be carried out.
2. You press *Stop* on the Operators panel.

In both cases the tool height measuring sequence should be started from the Operators panel as described above.

How to cancel measuring or calibration

All measuring pad operations are cancelled by:

- Press **Close** in the active dialog.
- Press *Stop* on Operators panel

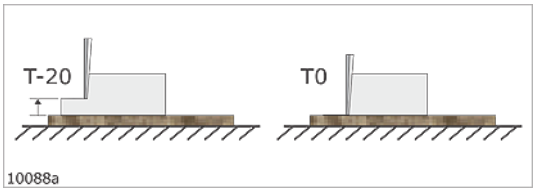
9. How To Procedures, Advanced

9.1 Cutting Thick Materials

When preparing materials with thickness between 45 – 50 mm (1¾ - 2 in.), the following rules apply:

- No **Camera** operations are available.
- Disable **Measure Material Thickness**.
- Disable the **Depth Referenced from Top** function.
- This function is for **Knife Tools** only.

Cutting depth when Depth Referenced from Top is disabled



Note: This function is useful for all materials with an un-even surface.

9.2 Hard Board Production

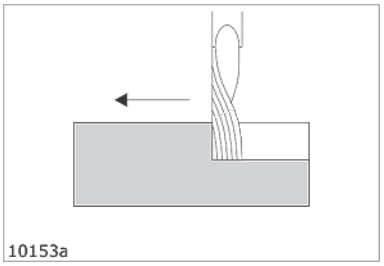
To prepare hard board materials, the procedure is as follows:

1. Mill through the top layer using **MultiCUT**.
2. Cut through the mid-section using the **HF VibraCut Knife**.
3. Mill through the bottom layer using **MultiCUT**.

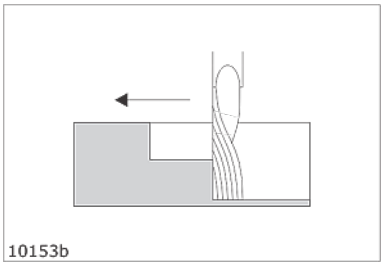
1. Ensure that the **Router Bit** is sharp and proper for the job.
2. Ensure that the **Knife Blade** is sharp and proper for the job.

9.3 Multi Pass Milling

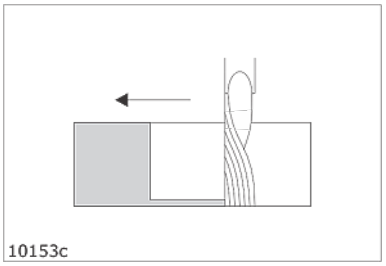
	Selected Job->Layers->Edit Layer
	Main Menu->Layer->Edit Layer



1. pass



2. pass



3. pass - mill through and clean the path

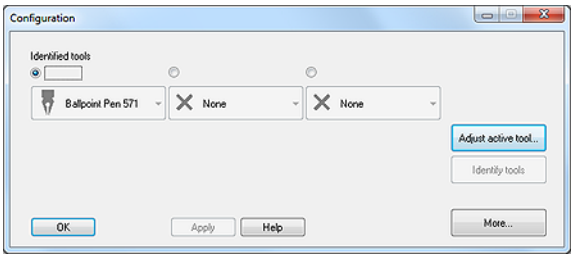
Multi Pass Milling is beneficial if you want to mill through a material where the thickness is bigger than the router bit diameter.

10. Tool Configuration and Adjustment

10.1 Introduction

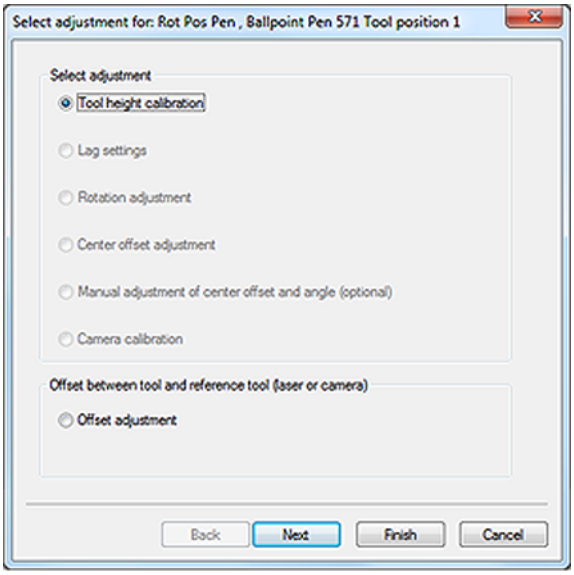
Machine Connection->Tool Configuration

The Tool Configuration dialog is used for all tool settings and adjustments.



The Tool Configuration dialog is used for all tool settings and adjustments.

10.2 Adjust Active Tool



From the **Adjust Selected Tool** – dialog, all **Tool Adjustment Wizards** are executed.

The following procedures are general descriptions of how to adjust the tools.

See the description of each **Tool Type** for more specific information:

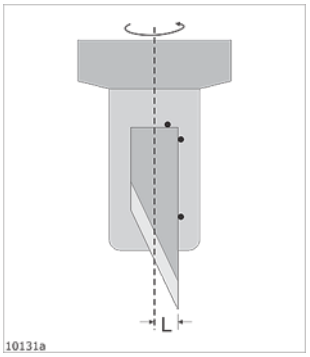
We recommend using a sheet of **Folded Carton** material, 5-6 mm / 0.2 inch, when executing the adjustments.

Note: All tools need to be adjusted in the position they will be used.

Before any adjustment, complete a **Table Top Reference** function:

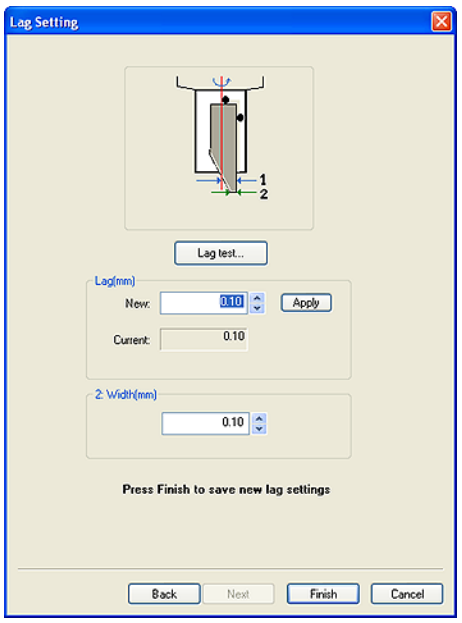
	**Main Menu->Machine->Table Top Reference**
	**Machine Panel Toolbar**->**Table Top Reference**

10.3 Lag Settings (for Rotating Tools)



1. In the **Configure Tool dialog**, select the tool to be adjusted.
2. Press the **Adjust Active Tool** button to enter the **Wizard Selection dialog**.
3. Select **Lag Settings**
4. Follow the instructions given to enter correct values.
5. Repeat the procedure for all rotating tools.

Lag Setting



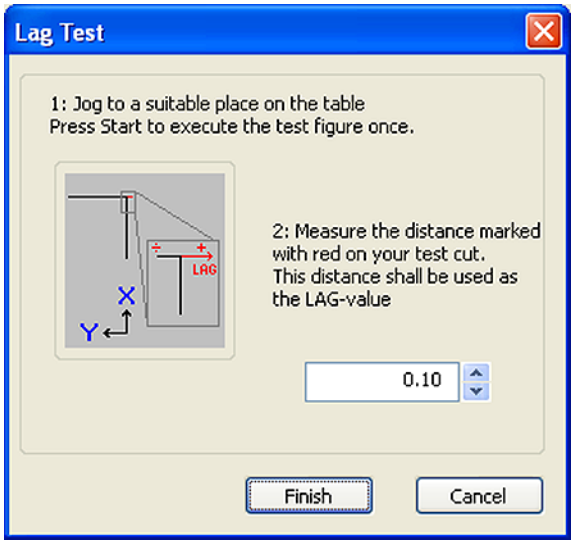
Lag – lag value. This is the distance from the rotation center to the back of the knife blade.

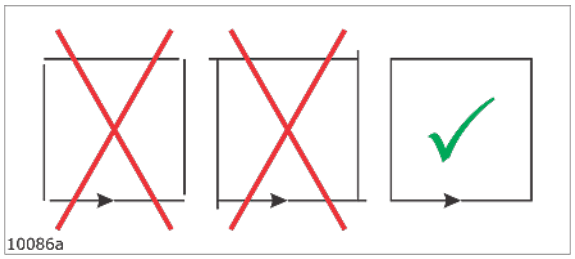
Enter the value as measured or as found using the Lag test, see below.

Width – knife bottom width

Enter the measured knife bottom width.

Lag Test



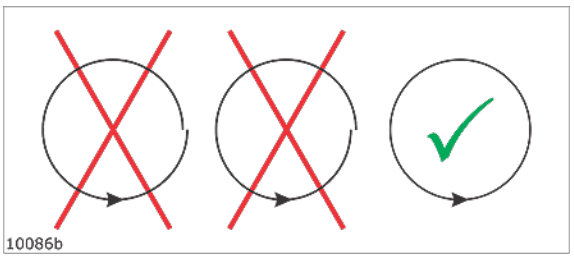


Run this wizard to obtain correct **Knife Lag** value.

Follow the instructions in the dialog.

Add the measured value to the displayed value.

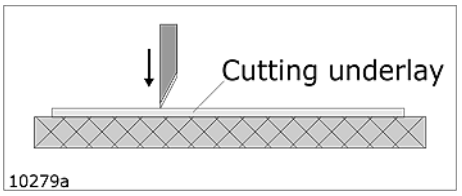
Circle Lag



Circle quality is determined by a parameter called **Circle Lag**. The parameter value will vary depending upon the actual material.

Therefore, the adjustment is located in the **Job Setup** dialog.

10.4 Tool Height Calibration



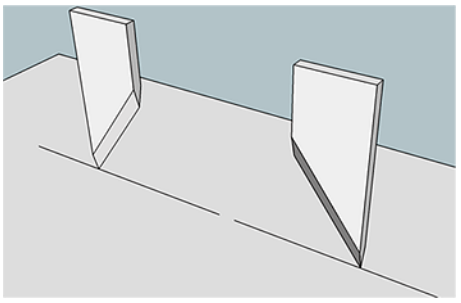
1. Select the **Tool** to be adjusted
2. Press the **Adjust Active Tool** button to enter the wizard selection dialog.
3. Select **Tool Height Calibration**
4. Follow the instructions given by the wizard, step by step.
5. Repeat the procedure for all tools.

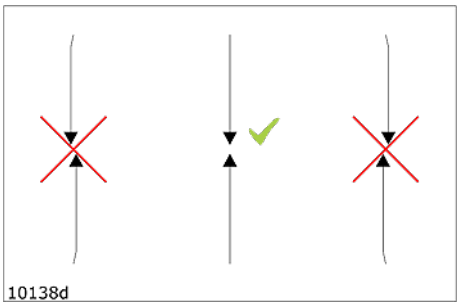
10.5 Rotation Adjustment (for Rotating tools)

Optimal **Angular Offset** may vary with different material strength and thickness.

The adjustment can be done using the adjustment wizards, or by a manual adjustment procedure:

Adjustment using Wizard





1. Select the **Tool** to be adjusted.
2. Press the **Adjust Active Tool** button to enter the wizard selection dialog.
3. Select **Rotation adjustment.**
4. Follow the instructions given by the wizard, step by step.
5. Repeat the procedure for all **Tools** mounted.

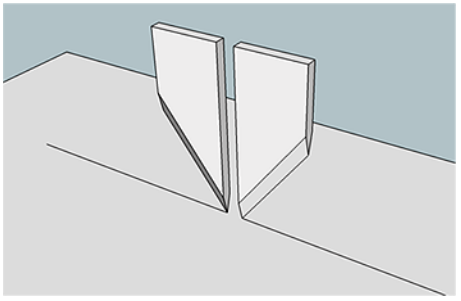
Manual Adjustment

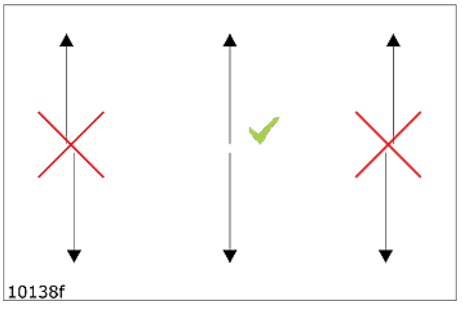
1. Place an appropriate test material on the table, and switch **Vacuum On**.
2. From **Tool Configuration** dialog, select one **Tool**.
3. Press **Adjust Active Tool** to enter the **Wizard Selection Dialog**.
4. Select **Manual Adjustment of Center Offset and Angle**.
5. Enter value for the **Angular Offset** and select **Activate**.
6. Note that the **Tool** will rotate as the new value is activated.
7. Press ***Tool Override Down***, and **Jog** approximate 10 cm to make a test cut.
8. Press ***Tool Override Down*** once more to lift the **Tool** again.
9. Press ***Tool Override Down*** once more to lower the **Tool** again.
10. Note how the knife enters into the material.
11. Press ***Tool Override Down*** once more to lift the **Tool** again.
12. If knife enters exact into the cut, the angle is correct; select **Finish** to exit.
13. If seen in the cutting direction, the knife enters to the left of the cut, the **Angular Offset Value** should be decreased. Repeat from point 5.
14. If seen in the cutting direction, the knife enters to the right of the cut, the **Angular Offset Value** should be increased. Repeat from point 5.

10.6 Center Offset Adjustment

The adjustment can be done using the **Adjustment Wizards**, or by a **Manual Adjustment** procedure:

Adjustment using Wizards





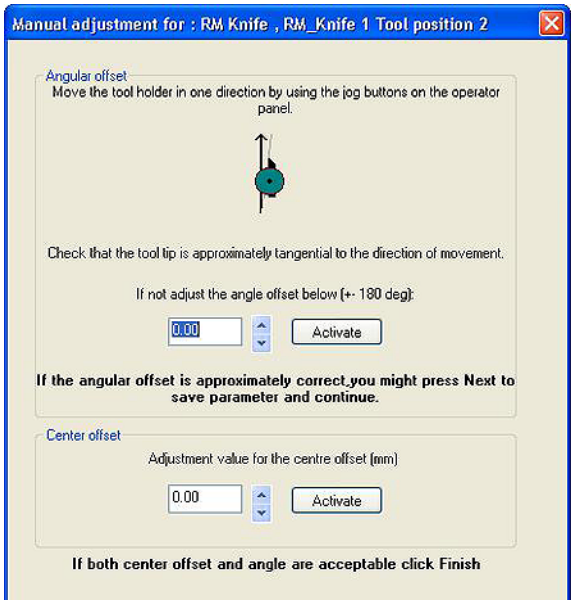
1. Put an appropriate test material, that means a thin paper on the table (any significant material thickness will create a misleading offset in this wizard).
2. Switch vacuum on.

3. Select the **Tool** to be adjusted.
4. Press the **Adjust Active tool** button to enter the wizard selection dialog.
5. Select **Center Offset Adjustment**.
6. Follow the instructions given by the wizard, step by step.
7. Repeat the procedure for all **Tools** mounted.

Manual Adjustment

1. Place an appropriate test material on the table, and switch **Vacuum On**.
2. From **Tool Configuration** dialog, select one **Tool**.
3. Press **Adjust Active Tool** to enter the **Wizard Selection Dialog**.
4. Select **Manual Adjustment of Center Offset and Angle**.
5. Enter value for the **Center Offset** and select **Activate**.
6. Note that the **Tool** will move as the new value is activated.
7. Press ***Tool Override Down***, and **Jog** approximate 10 cm to make a test cut.
8. Press ***Tool Override Down*** once more to lift the **Tool**.
9. Press the **Jog** button for the return direction shortly, just to turn the **Tool**.
10. Press ***Tool Override Down*** once more to lower the **Tool**, and **Jog** the same distance back.
11. Press ***Tool Override Down*** once more to lift the **Tool**.
12. The two cuts should follow exactly the same path.
13. If exact, the **Center Offset** is correct, select **Finish** to exit.
14. If not, modify the **Center Offset Value** and repeat from point 6.

10.7 Manual adjustment of Center Offset and angle



Sometimes it might be necessary to fine-tune the adjustments obtained using the wizards.

Use this dialog to modify the adjustment values for angle and center offset.

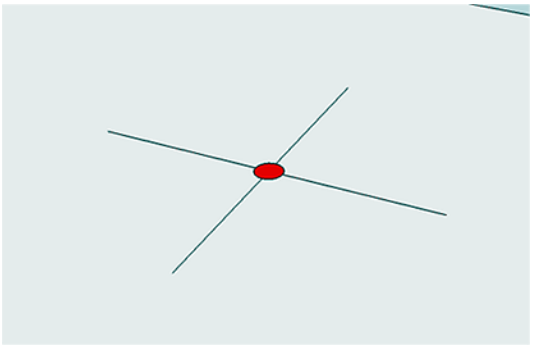
1. Select the tool to be adjusted.

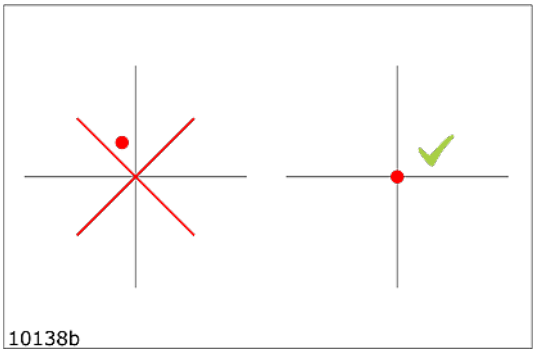
2. Press the **Manual adjustment of….** button to enter the adjustment dialog.
3. Key in or use the up/down arrows to specify the wanted offset.
4. Press Activate to enter the value.
5. Test the new settings.

Note:

All tools should, by default, be close to correct angle when the adjustment value is 0. The Manual adjustment of…. function is useful if you want to test a tool for correct behavior before program execution.

10.8 Tool Offset





The **Laser Pointer** is the reference:

1. Place an appropriate test material on the table, and switch **Vacuum On**.
2. Select the **Tool** to be adjusted.
3. Press **Adjust Active Tool** to enter the **Wizard Selection Dialog**.
4. Select **Offset Adjustment**.
5. A cross is made by the **Tool** to be adjusted.
6. The **Laser Pointer** is positioned in the center of the cross.
7. If necessary, jog the **Laser Spot** into the center of the cross.
8. Follow the instructions given by the wizard, step by step.

10.9 **Maintain Tool List (More...)**

The **More..** dialog contains selections to **Ignore**, **Delete** or **Add** to the **Tool List**.

The **Tool List** contains **Tools** that you can select for the available **Tool Positions**.

Ignore Automatic Tool Identification

Ignore Automatic Tool Identification may be used when the **Automatic Tool Detection** fails, and manual tool selection is necessary.

If **Ignore Automatic Tool Identification** is checked, **Tool Setup** remains unchanged after:

- **Table Zero Position** sequence
- **Identify Tools** function

Delete Tool

Use **Delete Tool** when a **Tool** is no longer in use.

The deleted **Tool** will no longer be available in the **Tool List** in the **Edit Layer** dialog.

Add Tool

Use **Add Tool** to

- Add new **Tools**
- Add tools that fails during **Automatic Tool Detection**

The **Tool** is added to the **Tool List**.

11. Tooling System

	**Knife Blades are extremely sharp.** **Take care when handling Knife Tools.**
	**Laser Radiation.** **Do not stare into beam!** **The tool head is equipped with a class II laser pointer. Emitted laser power < 1 mW.**

11.1 Tool handling and care

All tools are precision instruments and should be treated as such to ensure proper operation.

Take special care when:

- **Tools** are inserted or removed from their stations. No excessive force should be applied.
- **Tools** should not come in contact with hard surfaces while removed from their stations either temporarily or for storage.
- The **Tools** and their stations should be kept clean with a soft brush.

11.2 Tool Inserts with built-in motor

Some of the tool inserts has a built-in motor, such as the reciprocating knife tools, RotaCut and the FlexiDrillTool.

Only one motor drive outlet is available, thus, the number of such tools that can be used at the same time is limited to one.

It is recommended to remove any such unused tools from the tool holder.

Motor cable and connector

When disconnecting the motor cable, use the plug.

11.3 Tool Heads available, overview

FlexiHead

FlexiHead is a **Multi-purpose Tool Head** prepared for the following tools:

Bevel knife	KissCut knife	Pen
Crease	Knife	Reciprocating knife
Drill tool	MicroCut	RotaCut knife
Foam cutting knife		

PowerHead

PowerHead is a special purpose tool head, which can be equipped as follows:

- Two general tool positions prepared for the standard FlexiHead tools.
- PowerHead Creasing Tool for heavy duty creasing with high pressure and suitable wheel geometry.
- V-notch Knife Tool. Prepare a V - cut in triple-wall materials.
- HD knife Tool (jhbe)

FoamHead

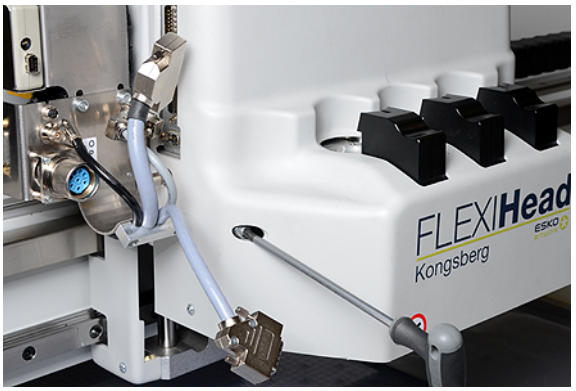
FoamHead is a single position tool head for cutting foam materials with thickness up till 86 mm (3 3/8").

MultiCut-HP

MultiCUT-HP is a special purpose tool head, which can be equipped as follows:

- Two general tool positions prepared for the standard FlexiHead tools.
- Milling tool equipped with a high speed milling spindle.

11.4 Tool Head mount / dismount



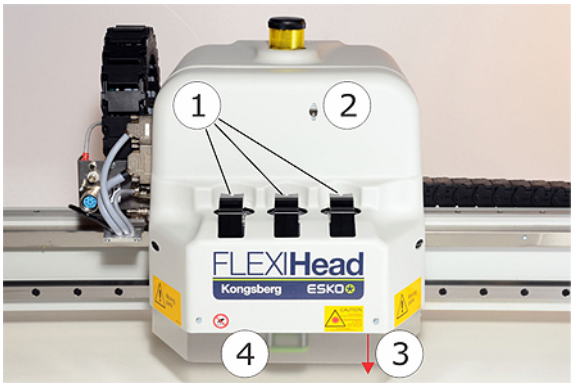
>>

>>

Be careful not to apply too much force when fixing the signal cables.

11.5 FlexiHead

Tool Head Description



1. Tool locking knob
2. Outlet for Reciprocating knife motor
3. Laser pointer
4. Measuring foot / material hold down foot. Has 3 functions:
   a. Measure the thickness of the material on the table
   b. Mapping Table Top Surface.
   c. Keep material down during knife operations

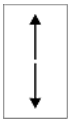
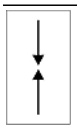
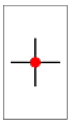
Replace a Tool Insert

Observe the alignment pins

Press the locking knob down

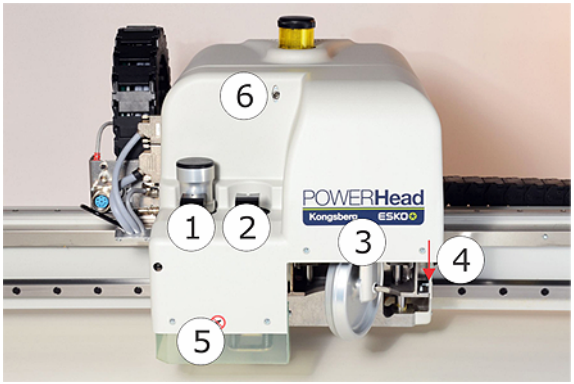
Tool Adjustments, FlexiHead

	Tool height Correct tool height relative to table top
	Lag setting

	Tool rotation Adjust tool angle tangential to moving direction
	Center Offset Adjust tool sideways until centered
	Tool Offset Adjust offset to laser pointer

11.6 PowerHead

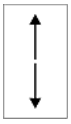
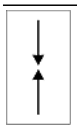
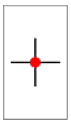
Tool Head Description



1. Tool position 1 (FlexiHead tool insert)
2. Tool position 2 (FlexiHead tool insert)
3. Tool position 3
4. Laser pointer
5. Measuring foot / material hold down foot
6. Electrical connection, reciprocating motor

Tool Adjustments, PowerHead

	Tool height Correct tool height relative to table top
	Lag setting The lag value depends upon the blade adapter. Nominal value is 0 mm.

	Tool rotation Adjust tool angle tangential to moving direction
	Center Offset Adjust tool sideways until centered
	Tool Offset Adjust offset to laser pointer

For more information about how to run the adjustment wizards, see the Tool Configuration chapter.

11.6.1 ø150 mm Crease Wheel

This crease wheel has the equivalent of 50kg [110lb.] of down-pressure.

The additional pressure, combined with the large frontal area of the big wheel enables excellent crease quality in heavy-duty corrugated board and even permits creasing board with high recycle content without breaking the liner.

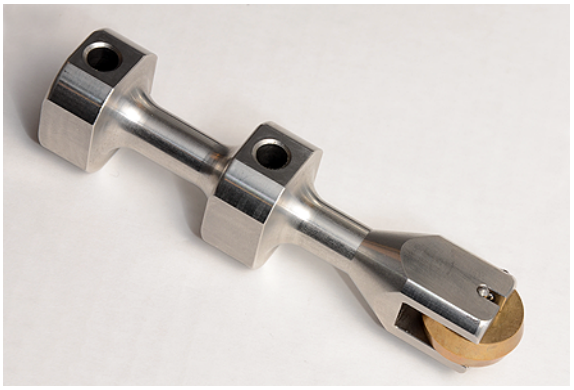
A broad range of wheels with different shapes is available.

How to mount / dismount the crease wheel

Insert / remove the latch pin.

Insert / remove the cotter pin.

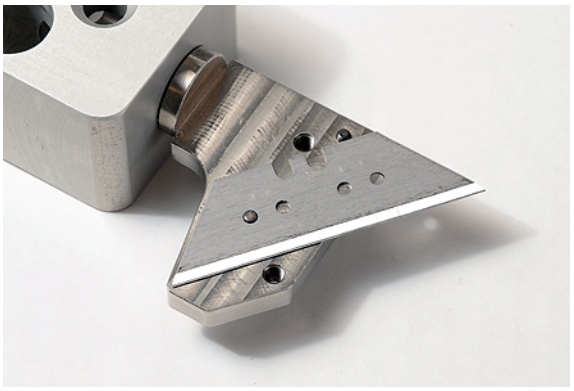
11.6.2 Crease Adapter ø26 mm



The Crease Adapter allows 26 mm (1 in.) crease wheels to be used in the Heavy Duty crease tool position. The tool is adjusted and operates as an ordinary crease tool.

11.6.3 HD Knife Tool

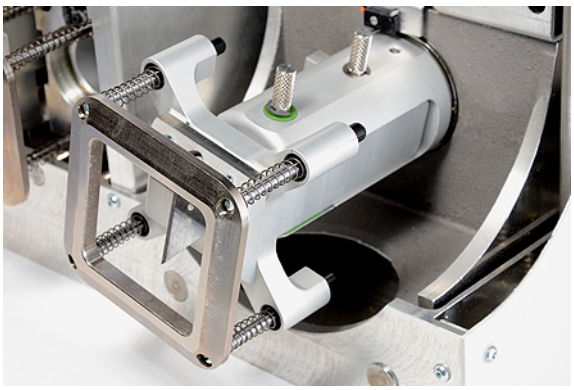
The HD knife adapter is inserted in the HD crease tool position. The tool is adjusted and operates as an ordinary knife tool.



Knife blade correctly positioned inside the adapter.

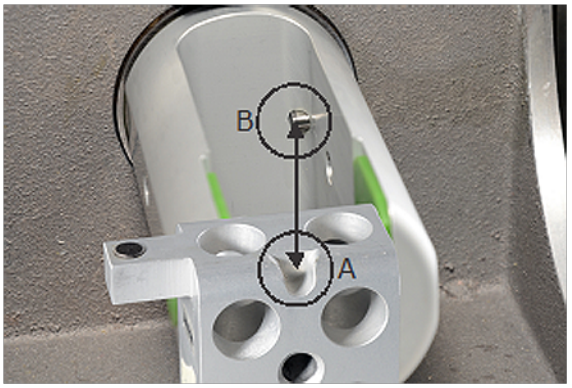
The HD knife tool is ready with the knife blade mounted.

11.6.4 V-notch Knife

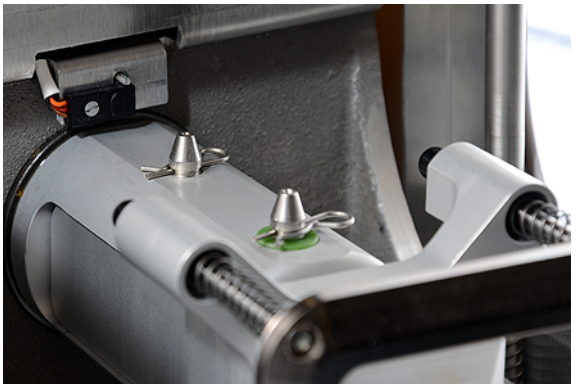


The V-notch knife tool mounted on a Heavy-Duty Unit.

How to insert / remove the V-notch knife tool



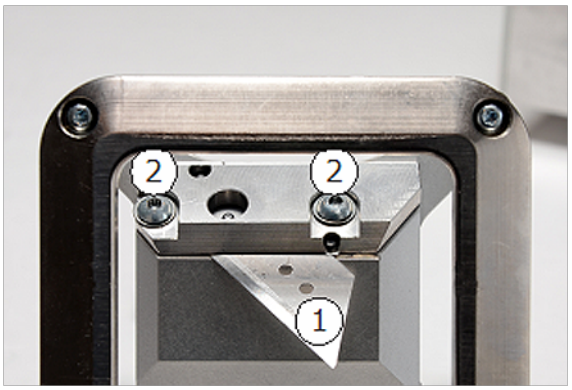
Turn the V-notch knife tool (A) correctly to fit the alignment pin (B).



Both latch pins are used for the V-notch tool

How to replace a knife blade

This picture shows how the knife blade is aligned using two guide pins beneath the blade clamping.

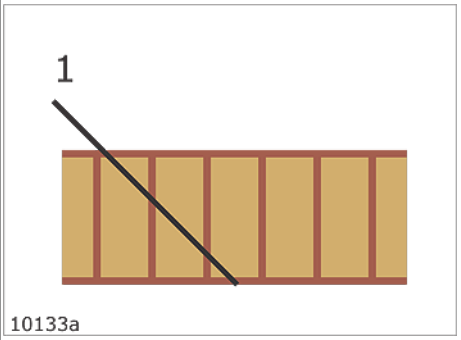
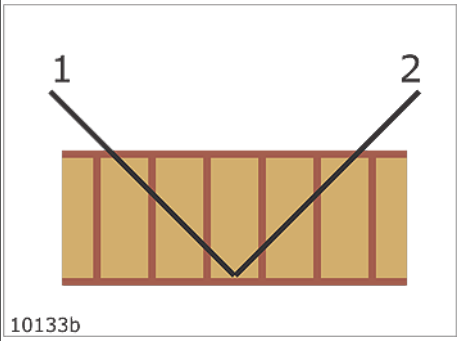
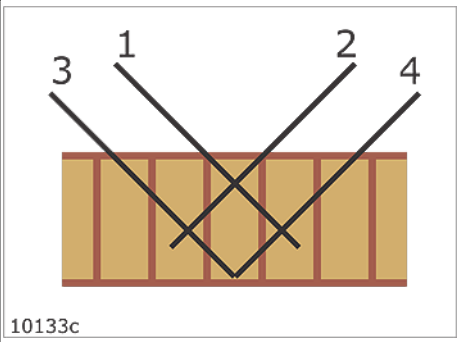


1. Loosen the two screws (2) of the knife blade clamping. 2. Carefully remove the blade (1). 3. Insert a new knife and make sure that it is aligned with the alignment pins in the tool head. 4. Mount the new tool. 5. Select **Option,**

	Tool Configuration (CTRL+T), **Adjust active tool, Tool height calibration** wizard, to assure correct height of the new knife.

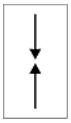
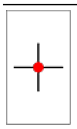
V-notch knife, modes of operation

Note: V-notch knife adapters for different angles are available. The programming and operation will be similar to the 45 degree version shown here.

 10133a	**Single Cut** Set from Job setup, Extended.
 10133b	**Double Cut (1)** This is the default mode if neither Single Cut nor 4-Cut are enabled.
 10133c	**4-Cut (1)** Set from Job setup, More V-notch.

Tool adjustment

- For the V-notch knife, we recommend the manual procedures for tool rotation and centre offset adjustment.
- When adjusting tool rotation and centre offset, use a thin folded carton material.
- Remember that you should look at the bottom side of the material for correct alignment.
- The adjustment depends upon the actual material due to weight, structure and thickness. For optimal result, a fine tuning of the adjustments in the actual material should be carried out.

	Tool height Correct tool height relative to table top
	Lag setting Nominal value is 0-7 mm.
	Tool rotation Adjust tool angle tangential to moving direction
	Center Offset Adjust tool sideways until centered
	Tool Offset Adjust offset to laser pointer

For more information about how to run the adjustment wizards, see the Tool Configuration chapter

V-notch settings are maintained from:

	**Selected Job**->**Layers**->**Edit Layer**
	**Main Menu**->**Layer**->**Edit Layer**

How to set the depth of the V-notch knife

1. The default depth of the V-notch knife is cut through the entire material.
2. Define the depth of the V-notch cut in the dialog.
3. Normally the cut should extend down to just above the bottom liner closest.

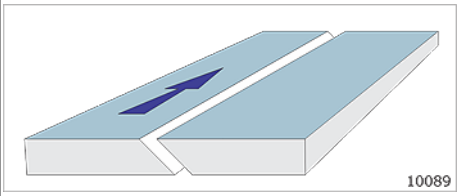
How to set the width of the V-notch cut

From the dialog, modify the default width.

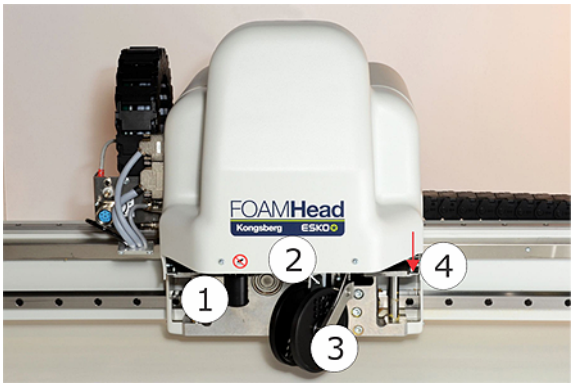
How to run the 4-cut function

From the dialog, select funtions.

V-notch cut direction

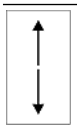
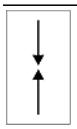
	The blade angle and the cut direction must be taken into account when cut jobs are prepared. The arrow indicates the cut direction.

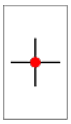
11.7 FoamHead



1. Height sensor
2. Knife adapter
3. Material hold down wheels. Operator protection.
4. Laser pointer

Tool adjustments, FoamHead

	Tool height Correct tool height relative to table top
	Lag setting Default lag value for the long foam knife is 4.5mm/0,18"
	Tool rotation Adjust tool angle tangential to moving direction
	Center Offset Adjust tool sideways until centered



Tool Offset

Adjust offset to laser pointer

For more information about how to run the adjustment wizards, see the Tool Configuration chapter

Partial through cut

Partial through cut is specified as an absolute value or a percentage value in the Job Setup dialogue.

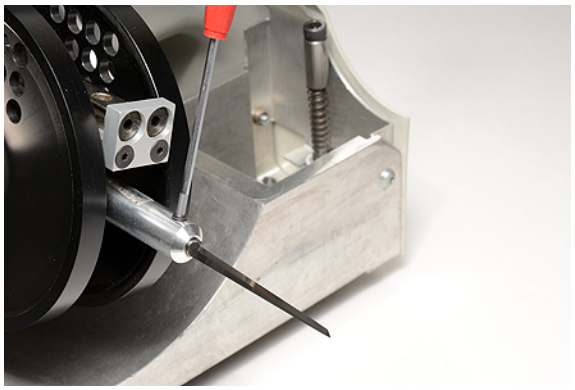
Please note that the value is specified from the top of the material and down.

Cutting quality

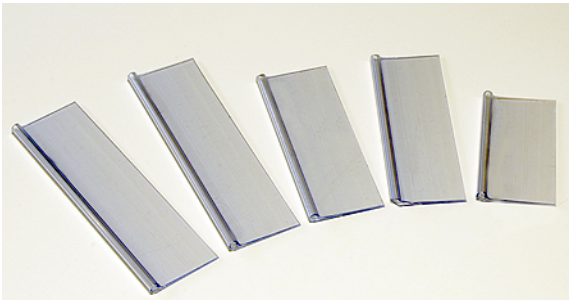
To obtain best quality when cutting details, as small circles, we recommend:

- Reduce the cutting speed (from Job Setup)
- Cut in two or three passes, each pass going a step deeper (Multi pass).

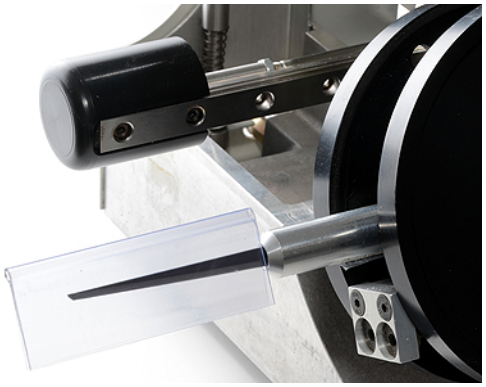
How to replace a knife blade



Loosen the fixing screw, replace the knife blade and fix it again.

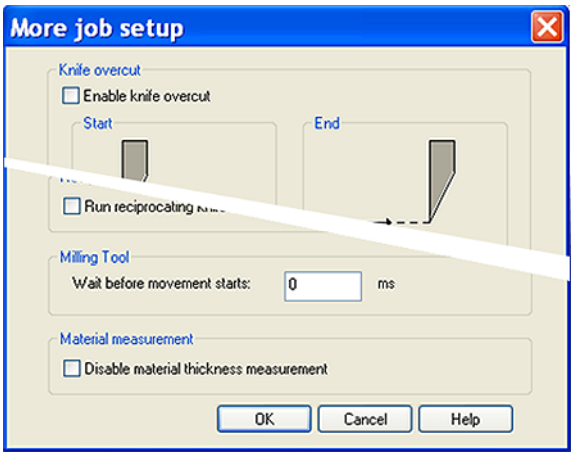


A set of knife protection handles are available. Use them for safe knife handling.



When not in use, protect the knife blade using the handle.

Disable material thickness measurement



Set from Job setup -> More

For the Foam Knife tool, the Disable material thickness measurement function is available. Use this function if

- Your foam material is too soft for the measuring system.
- The surface of your material is un-even.

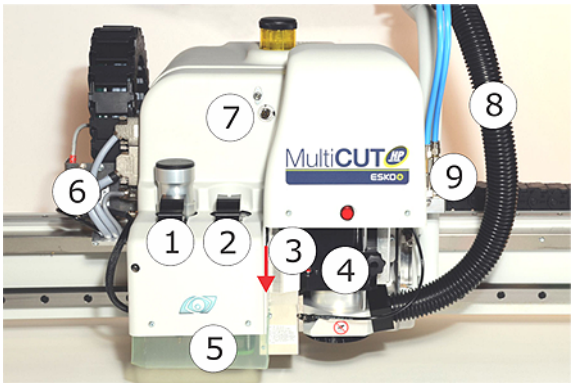
When the Disable material thickness measurement function is enabled, the following rules applies:

- In Job setup, the T – function must be used for depth settings.
- In Job setup, the Depths unit must be set to mm/inches (Percent not allowed).
- During tool up movements, the knife is lifted to its top position.

11.8 MultiCut-HP

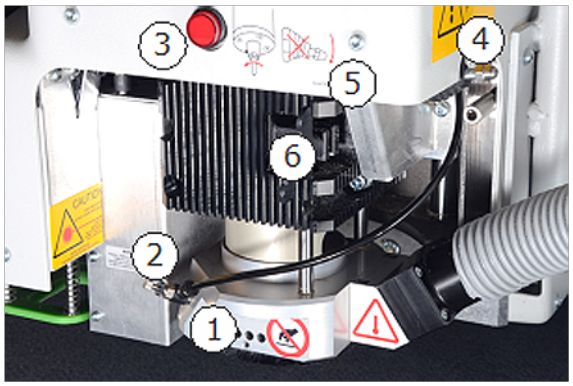
Router Bits are extremely sharp!

11.8.1 Introduction

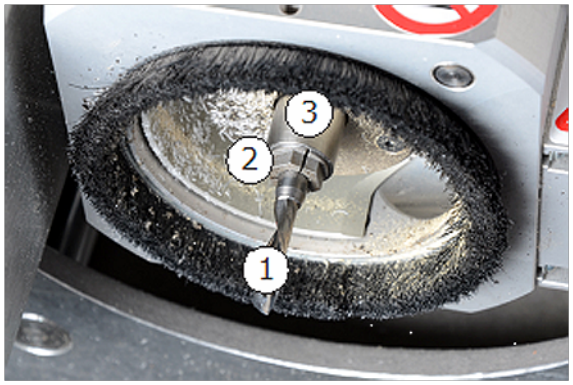


MultiCUT-HP

1. Tool position 1 (FlexiHead tool insert)
2. Tool position 2 (FlexiHead tool insert)
3. Laser pointer
4. Tool position 3
5. Measuring foot / material hold down foot
6. Electrical connection, router spindle motor
7. Electrical connection, reciprocating motor
8. Suction hose
9. Cooling water connectors

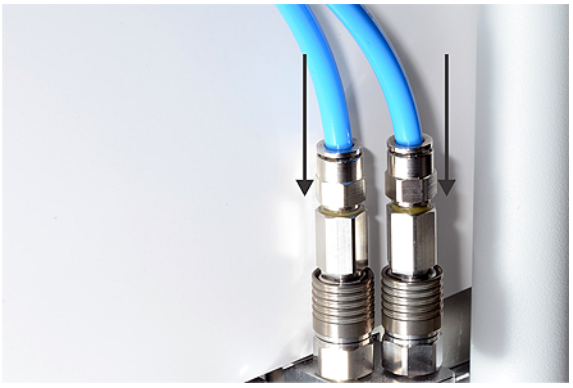


1. Suction house with brush for chip removal. During normal operation, the house is in down position. When changing bit, the house should be locked in its upper position.
2. Air blow adjustment. Air blow is used for router bit cooling and to ease chip removal. Adjust for proper operation. There is also an air blow inside the spindle, but no user adjustment is necessary.
3. Warning lamp for spindle running.
4. Collet open/close. The shown position is closed. Note: Ensure there is a router bit inserted when the collet is closed.
5. Air clean button to help remove contamination.
6. Locking screw for the suction house. This screw is used when you want to lock the suction house in a certain height.



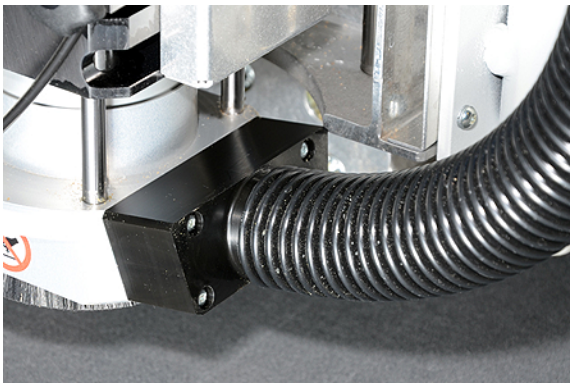
1. Router bit. Shaft diameter is 6 mm (CL) and 6/8 mm (HP).
2. Collet. MultiCUT-HP is equipped with one 6 mm collet on delivery.
3. Spindle

Water tube connections



Connect water tubes: Push the tube connectors into the receptors. Sequence is not important.

Release water tubes: Pull down the release locker on each connector.



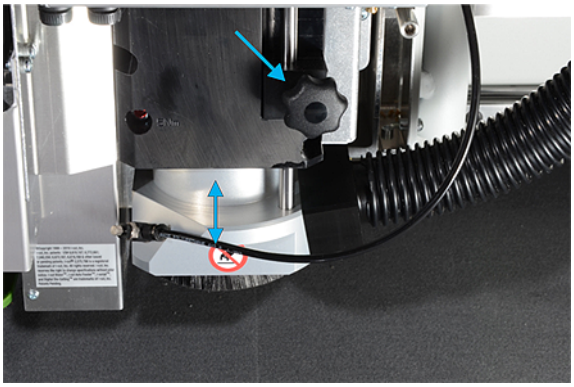
The suction tube is fixed to the suction house.

When MultiCUT-HP is not in use, the suction tube and the water tubes are fixed to the traverse as shown here.

Chiller / MultiCUT-HP start up time

Depending upon the environmental temperature, the chiller needs some start-up time after power on before it is ready to operate. Typical delay is 2 – 3 minutes.

Suction house, adjustable height



On MultiCUT-HP, you can lock the suction house in any height; still it is allowed to move upwards.

This function is useful in order to

- Adapt to different material thicknesses.
- Allow false air input in order to reduce suction force.

RPM limitation

Running 8 mm bits at a high RPM rate can generate vibrations and excessive wear.

Using bits with extended lengths at high RPM can also be dangerous.

Therefore, using long bits is subject to an automatic RPM reduction.

If you are using short 8 mm bit, these must be limited manually to 40.000 RPM.

In general, 6 mm bits are preferable in materials up to 20–25 mm thickness.

Chiller error codes

If any chiller failure occurs, look at the chiller display to see the real reason for the problem:

Code	Description
E0	Sensor failure: cable defective, connection failure, sensor defective.
IA	Water level of water flow too low.
HI	Temperature of cooling medium too high
LO	Temperature of cooling medium too low

11.8.2 Safety Issues

Suction house

Always, when executing a job, let the suction house float on top of the material. In addition to chip removal, the house reduces the risk of being hit by small work pieces or by a breaking router bit.

Eye protection

Use eye protection when working with MultiCUT/MultiCUT-HP.

Hearing protectors

The noise generated by MultiCUT/MultiCUT-HP highly depends upon the material processed, and running parameters. Use hearing protectors when necessary.

Spindle speed

Never use speeds higher than recommended by the bit supplier. Special care should be taken when using bits with cutting diameter larger than shank diameter.

Router bits

Router bits are very sharp – handle with care.

Never touch a rotating bit. Ensure the warning lamp is dark, and also observe that the bit is not rotating before approaching the bit.

Always insert a dummy bit before dismounting a tool head from the machine.

High temperatures

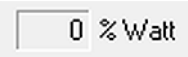
Be aware that the MultiCUT may become hot during operation.

Clean surface

Keep the table and material surface clean, free from obstacles.

11.8.3 Precautions

Spindle motor power consumption supervision



Too high spindle power consumption indicates critical conditions for the motor and immediate actions should be taken:

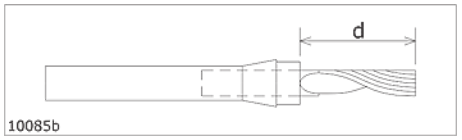
- Use correct and sharp milling bit.
- Use correct RPM for the actual bit and material.
- Reduce the X/Y speed.

If the motor is running above a critical limit, the execution will stop and a message is displayed.

Use of non-balanced bits

One-flute bits are by nature non-balanced, and **may destroy the spindle** if used wrong. Therefore, one-flute bits with cutting diameters above 4 mm, 5/32 inch must be run with a **maximum RPM of 40.000 (MultiCUT) 60.000 (MultiCUT-HP).**

Keep distance d small



For best performance and minimum wear, do not let the bit stick out more than necessary. Use bits with short cutting lengths for thin materials.

Air valve operation

Never operate the air valve while the spindle is running. **This will destroy the spindle.**

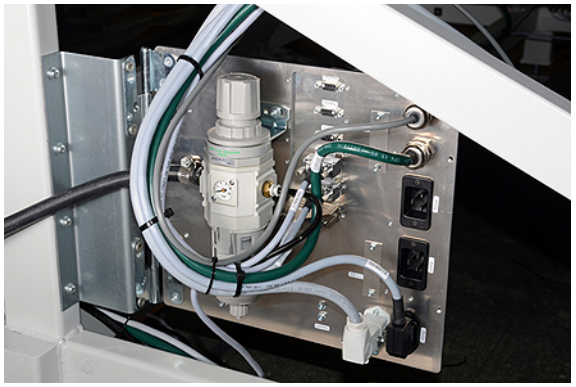
Air pressure

Never run IBAG spindle with air pressure disconnected

This may destroy the spindle.

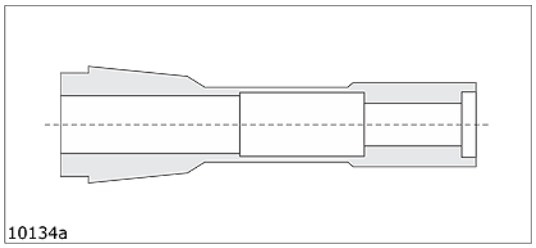
Keep this in mind also for test purposes.

Use clean air



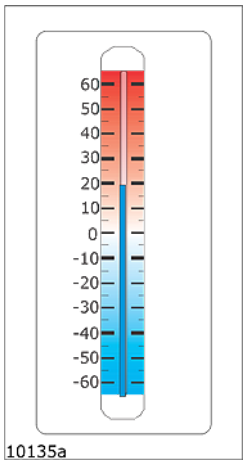
The spindle is sensitive for the pressurized air quality. Regularly check the air pressure reduction valve according to the maintenance section.

Maintain bit clamping



Un-proper clamping may cause the bit to slip in the collet and **damage to the table top.** 1. Keep the bit shafts clean. Avoid greasy fingers. Clean the bit shafts with acetone if necessary, but use only dry cotton tips on the collet. 2. Maintain air supply pressure of 7 bar. Follow procedures for Collet change and clean strictly.

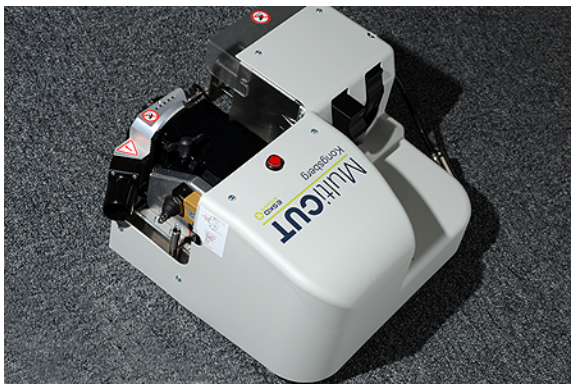
Operation at low and high temperatures



Never run a spindle when ambient temperature is below 10 °C, 50 °F.

Continuous operation at temperatures above 30 °C, 86 °F is not recommended (MultiCUT)! MultiCUT-HP spindle is water cooled, thus, the ambient temperature is not that critical for the spindle itself.

Long term storage



More than 4 weeks storage of a spindle or a MultiCUT/MultiCUT-HP requires:

1. Turn the spindle by hand about 20 turn every 4 weeks.
2. Spindle must be stored horizontally.

Consider having a replacement spindle

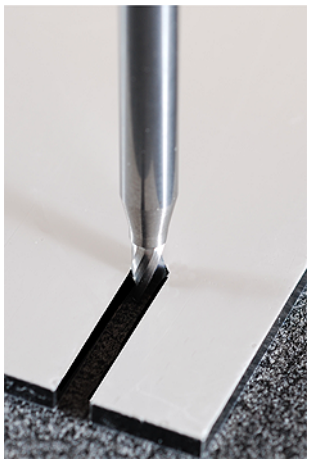
If the MultiCUT/MultiCUT-HP is used in regular production, it is recommended to have a replacement spindle. The service interval will depend on the type of operation, and is difficult to predict. Indication of worn bearings may be increasing noise, increasing vibrations or decreasing surface finish. Note: When replacing a spindle, torque the motor clamp to 5 Nm, 44 lbf-in using a torque wrench. **This is a low torque for that screw size.** Also check by hand that the spindle rotates smooth without any resistance.

Empty vacuum cleaner in time

Do not leave the machine running if the vacuum cleaner can go full. **This might cause damage.**

11.8.4 Routing Advice

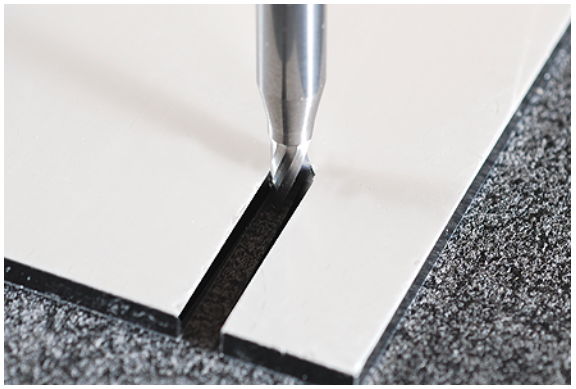
Milling bits



Use bits with short cutting lengths for thin materials.

For best performance and minimum wear, do not let the bit stick out more than necessary .

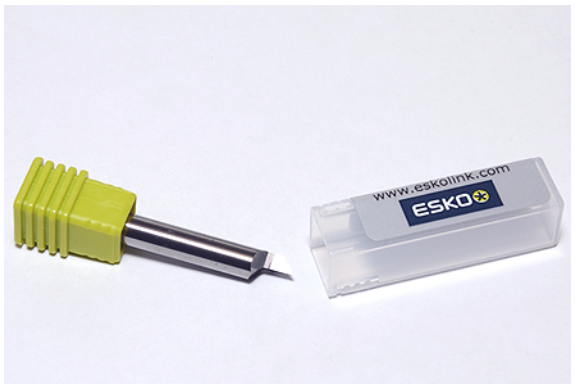
Never use higher RPM than recommended by the bit supplier. Special care should be taken when using bits with cutting diameter larger than shank diameter.



Bits with small cutting diameters (3-4 mm; 0.12-0.16 in) are more balanced than bits with larger cutting diameters, and can be run with higher RPM, normally 60.000.

Use large diameter bits (5-6 mm; 0.20-0.24 in) when needed to get rid of the chips in thick materials. **Max RPM (MultiCUT) 40.000.**

Max RPM (MultiCUT-HP) 60.000.

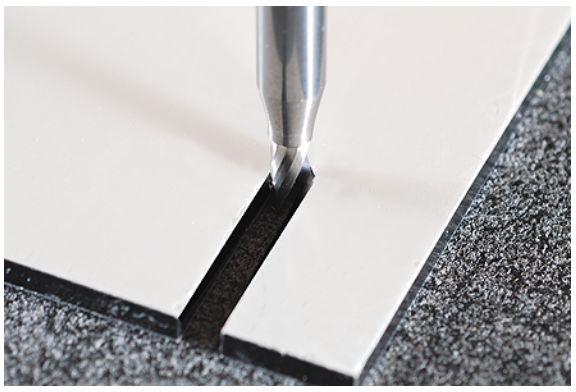


Edges are brittle. Never let bits touch each other, or other hard surface. Always store in proper container.

Acrylic or Multi Purpose bits

Acrylic bits (A) are polished, extra sharp for Acrylic, wood etc. Multi Purpose bits (MP) have a higher wear resistance, and are suitable for aluface, plastics, MDF, plywood, wood etc. MP bits can be identified by a small tooth at the tip.

Feed rates



One-flute bits do have a good chip flow, and allow for large feed rates. 0.1-0.2 mm/tooth (0.004-0.008 in/tooth) can be a starting point for optimization in most materials: This gives a feed rate of of 4-8 m/min (2.6-5.2 ips) at 40.000 RPM, and 6-12 m/min (3.9-7.9 ips) at 60.000 RPM. Light materials like PVC foam can be run much faster. The surface finish or the power consumption will normally determine the final feed rate for an application. A large drop in RPM, or a high %Watt value in the display, indicate too high feed rate. Large diameter bits require more power than small diameter bits. Worn bits increase the power

Number of passes in thick materials

The number of passes depends on material type, thickness and bit diameter. Use a pass depth that makes the groove free of chips, normally that is a depth equal to the cutting diameter.

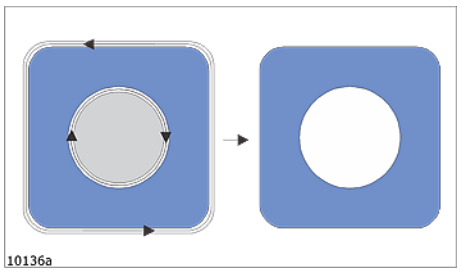
Material hold down

Material hold down may be a limiting factor. Especially parts cut loose can be a problem if they are small.

This can be done to improve the situation:

- Use bits with smaller cutting diameter
- Cover unused table area
- Use wash-out functions instead of cutting loose small waste parts.

Milling direction



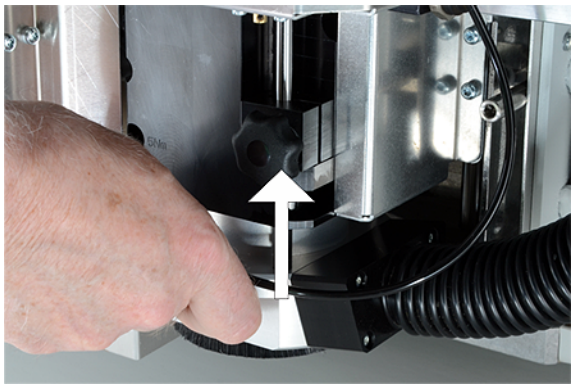
The milling direction is important i order to obtain a good result. Correct directions are illustrated in the figure at left. The blue part is our product where we want the edges to be smooth and nice. **Note** Altering the milling direction is to be carried out in the CAD program.

KissCut and MicroCut knife tools on MultiCUT/MultiCUT-HP

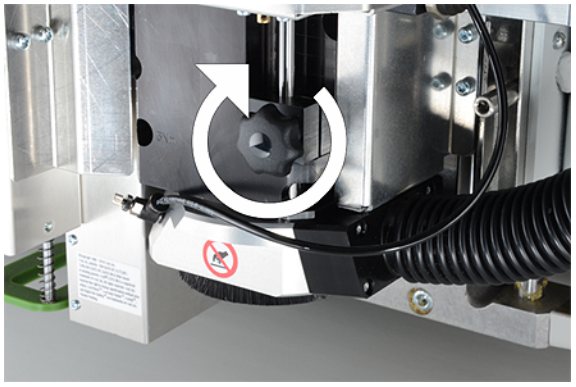
It might be necessary to reduce the acceleration in order to achieve an optimal cutting quality when combining a heavy tool head with high quality cutting tools.

11.8.5 Bits and Bit Change

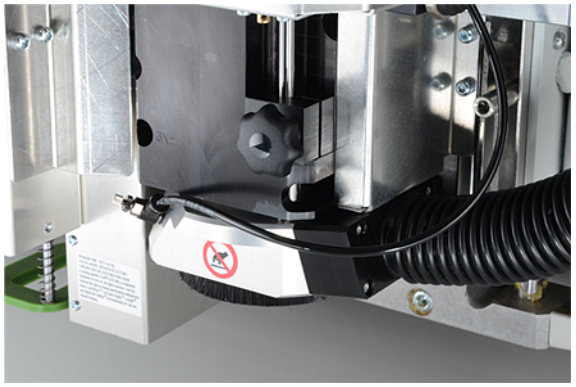
How to insert / replace a router bit



Ensure the spindle is not running - lamp is dark. Mind the sharp bit, and move the suction house up.



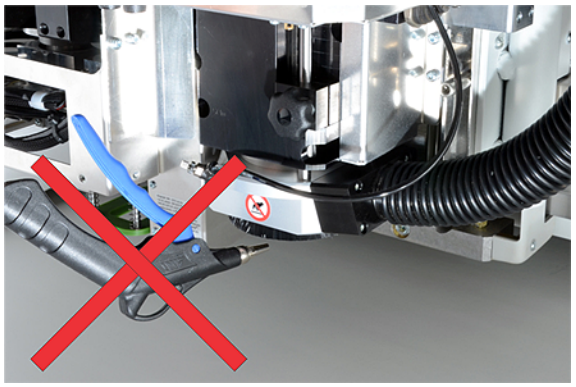
Lock the house in its up position.



Observe that the bit is not rotating. Use a cloth to hold the bit. Move the lever down to open the collet. Put the bit in a proper storage container. Insert a new bit. Close the collet

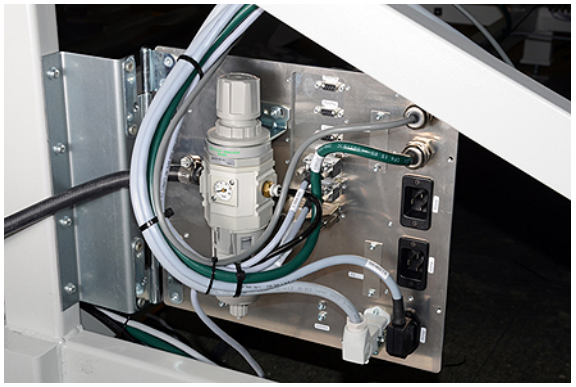
Only the round part of the shaft should be inside the collet. See the ‘MultiCUT/MultiCUT-HP - bit length and position’ – chapter for more information.

Release the lock to allow the suction house moving down to its down position.



Regularly, perform a collet holder and collet cleaning, following the dedicated procedure. Note: Never apply compressed air for cleaning.

If a bit is stuck

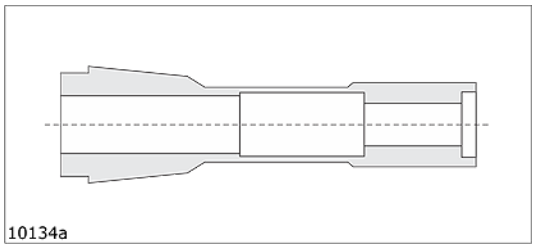


If a bit is stuck in the collet, the probable cause is low air pressure. To release a router bit from the collet, a pressure of approximately 7 bar is required. If necessary, check the table regulator setting, or the pressurized air source. If the bit is still stuck, see the *Collet change and clean* section how to unscrew the collet.

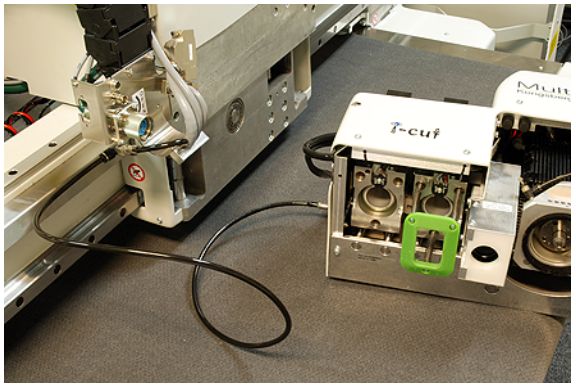
11.8.6 Collet Change and Clean

Clean the taper and the collet regularly for proper operation and optimum life time of spindle and collet; at least once a week, but more often if necessary. Follow the procedure strictly.

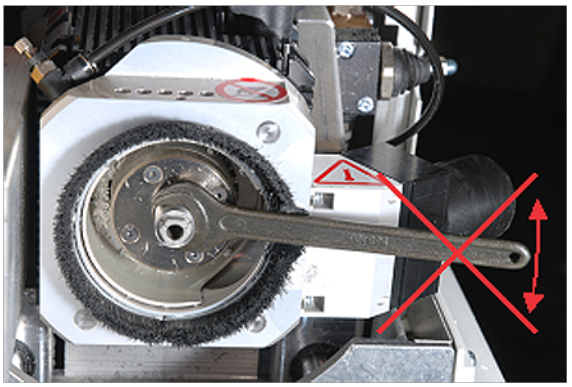
Normally, the collet has a long lifetime. Extended vibrations or impacts may hurt the collet, and cause bad milling results. Trying a new collet is the easiest way to identify if the collet is the problem. Running with a bad collet will also increases the spindle wear.



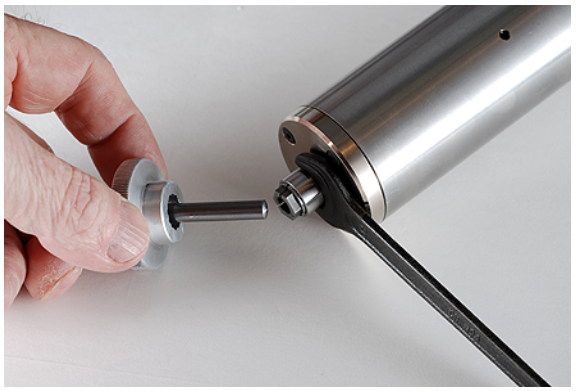
The IBAG collet is lockable, meaning it needs no adjustment when entering the bit.



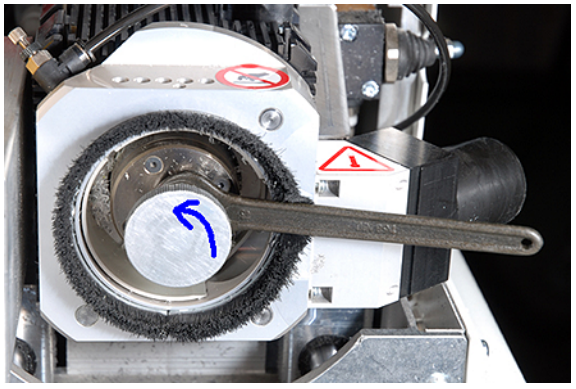
Place the tool head on the table. Open the collet and remove any bit. Note: Never apply compressed air for cleaning.



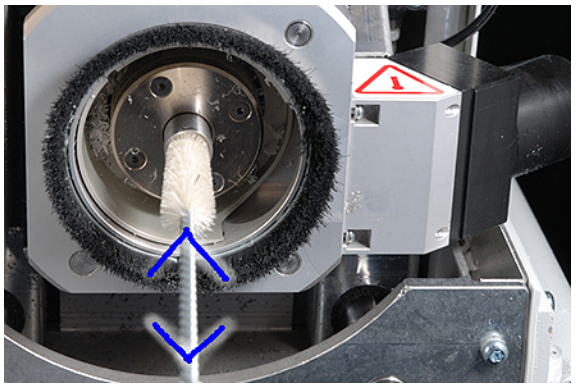
Apply the 13 mm (17 mm for MultiCUT-HP) key to hold the spindle rotor. Note: Do not turn the rotor when in CHUCK OPEN position. This might damage the spindle.



Enter the collet tool with a dummy bit to the collet.



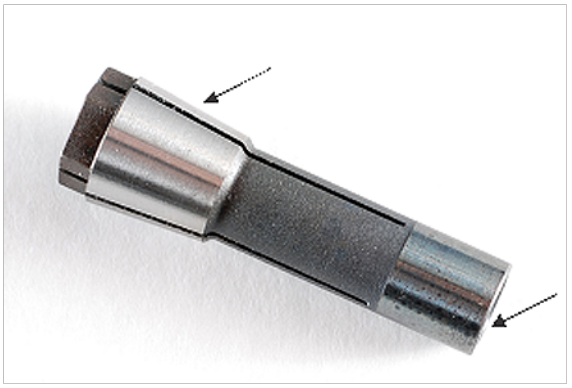
Hold the rotor with the 13 mm (17 mm for MultiCUT-HP) key and unscrew the collet with the collet tool. Note: If you can not move the collet with the collet tool, another 10 mm (12 mm for MultiCUT-HP) key might be used, together with a bit, to **unscrew** the collet. This procedure might be necessary if a bit is stuck.



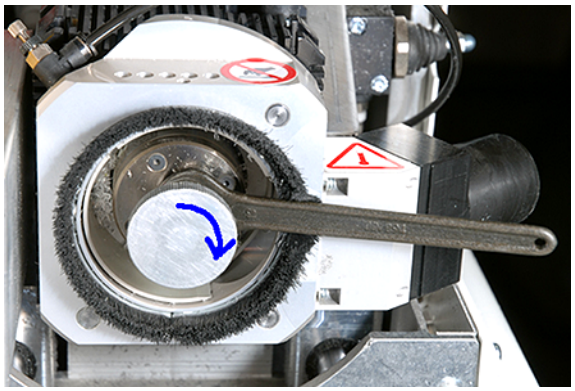
Apply the taper brush to clean the taper.

Push the air clean button to help remove contamination.

Clean the collet.



Apply small quantities of grease to the threads of the collet when necessary. Avoid the clamping area. Do not use oil, as it could enter the clamping area and reduce the clamping force. Also apply small quantities of grease to the outer cone of the collet.

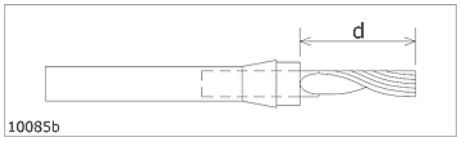


Torque up the collet by hand, using the collet tool and a dummy bit. (Maximum torque 2 Nm, 18 lbf-in). Hold the rotor with the 13 mm/17 mm key.

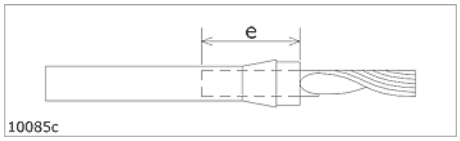
Close the collet on a dummy bit.

Chuck maintenance kits are available on the Esko web shop, www.esko.com.

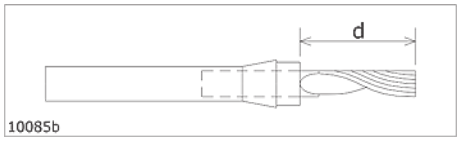
11.8.7 Bit Length and Position



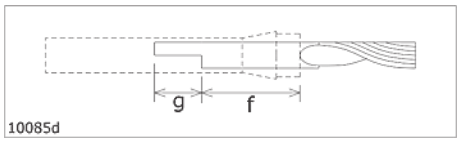
Keep distance d small. For best performance and minimum wear, do not let the bit stick out more than necessary. Use bits with short cutting lengths for thin materials.



For proper clamping, keep distance e 20 mm, 0.8 inch as a minimum.



To achieve material through-cut, the distance d must be at least 18 mm, 0.7 inch.



Balanced bits Bits with balanced surface should have a clamping length f of min. 20 mm/0.8 inches. Maximum balancing length g is 12 mm / 0.5 inches.

11.8.8 Tool Adjustment

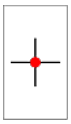
For FlexiHead tool positions, complete relevant adjustments as described for FlexiHead.

For the router position, complete the following adjustments:

Tool height

Correct tool height relative to table top.

The tool tip should touch the material surface.



Tool Offset

Adjust offset to laser pointer

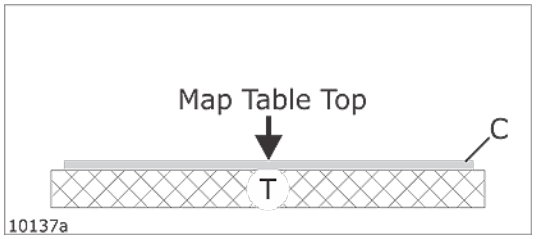
For more information about how to run the adjustment wizards, see the Tool Configuration chapter.

Notes regarding Tool height adjustment:

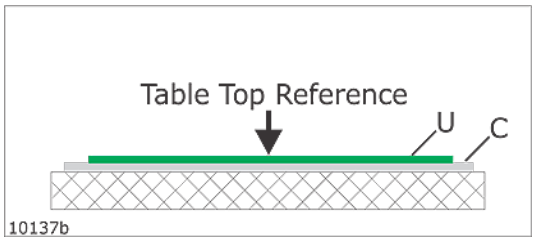
When properly adjusted, the router bit should barely touch the top surface of the material.

11.8.9 Table Top and Height Adjustment

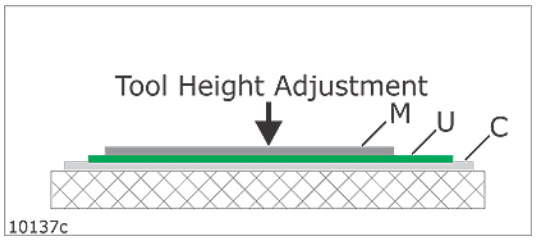
The following rules apply when adjusting MultiCUT-HP



T = Cutting table C = Cutting underlay **Map table top** function is carried out on top of the Cutting underlay.

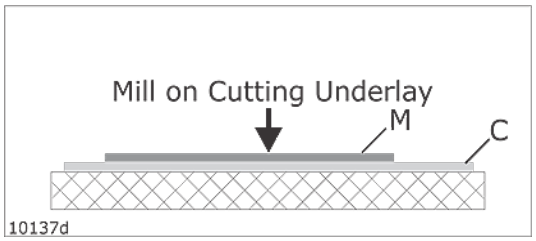


U = Milling underlay The **Table top reference** function is carried out on top of the Milling underlay

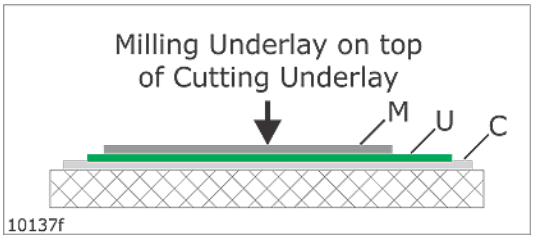


M - material to be processed **Tool height adjustment** is carried out on top of the actual material or on top of any other "test" material. Note: This adjustment can be completed both on surface U and M (not on C), but we recommend the described solution.

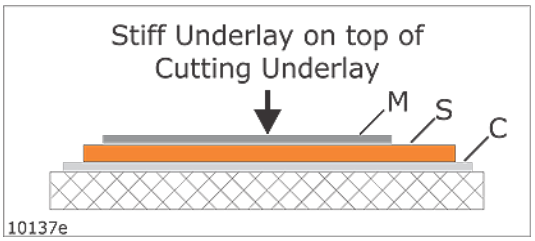
The following rules apply when milling



Mill on cutting underlay (C): To avoid damage to the cutting underlay, the downward movement of the drill-bit is stopped 2 mm / 0.08 inch above the cutting underlay. Thus, it is not possible to mill through the material in this case. Tool height will follow the mapped tabletop.



Milling underlay (U) on top of the cutting underlay: To be able to mill through the material, the thickness of the milling underlay must be > 2 mm / 0.08 inch. If the thickness of the milling underlay (U) is < 5 mm (0.2 inches), the tool height will follow the mapped table top.

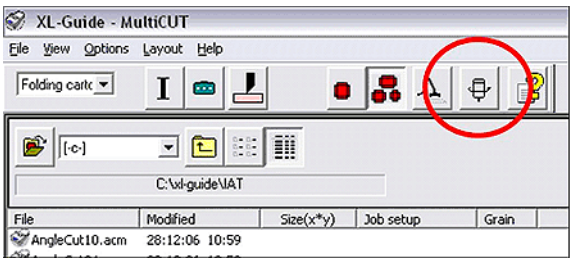


A stiff milling underlay (S) on top of the cutting underlay: If the thickness of the milling underlay (S) is > 5 mm (0.2 inch), the underlay is supposed to be more or less stiff. One typical milling underlay material is MDF, face milled on top. In this case, when the underlay is supposed to be stiff, the measured 'table top reference' value is used for height control

11.8.10 Miscellaneous

Warm Up

To protect the spindle, mandatory WarmUp is implemented. If the spindle has been inactive for 8 hours or more, a 3 min. WarmUp is required. WarmUp is started with this button:



If the spindle has been inactive for 4 weeks or more, an extended sequence is required, called RunIn. This takes 20 minutes.

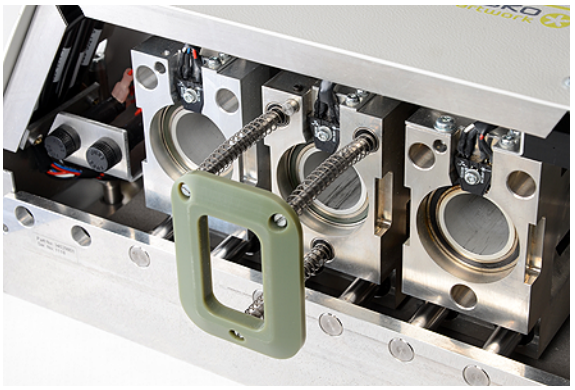
Suction house

Clean the suction house when necessary with acetone and a q-tip. A smooth surface will ease the chip removal.

Vacuum clean the milling underlay

The vacuum cleaner can be used for automatic cleaning of the felt: Use the FaceMill.exe to make a file that covers the actual area. Set “bit size” to 65 mm (2.5 inch), and set trim sizes to zero. Hint: Make a file name that reflect the size used. Make a job setup file with low spindle speed, zero depth, and maximum feed. Insert the dummy bit into the collet, and adjust tool so the brush is working properly.

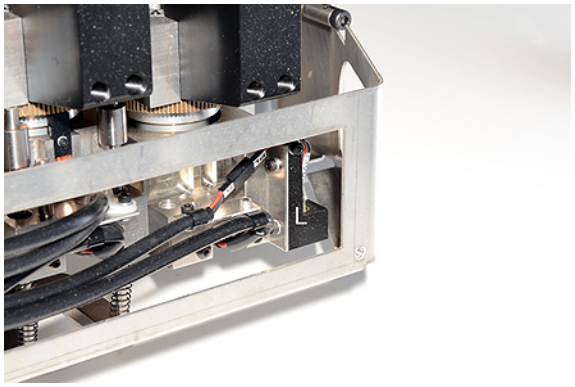
11.9 Measuring foot



The Measuring has 3 functions:

1. Measure the thickness of the material on the table
2. Map table top surface.
3. No adjustments are necessary.

11.10 Laser pointer



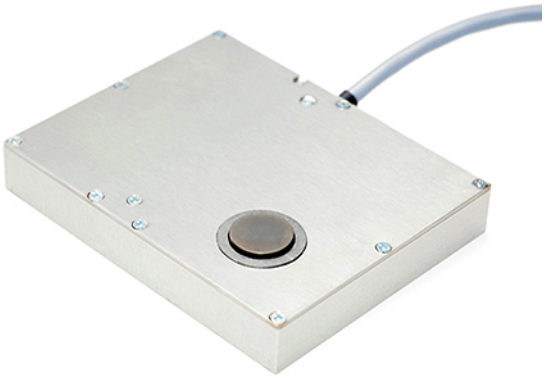
The Laser pointer (L in the illustration) is a Class II laser beam pointing device. Wavelength: 650 nm, 1 mW.

The laser pointer is used in adjustment wizards and job execution to indicate current position on the table.

The laser pointer is lit as long as it indicates the correct current position.

If there is no manual operation of the table, the laser pointer will be switched off after a 30 sec. time out. Pressing any button on the Operators panel will switch the laser pointer on again.

11.11 X-pad



11.11.1 X-pad Calibration

Note: Remove any cup or cover surrounding the tool tip during this procedure. As a consequence, take care.

In order to work properly, the X-pad itself must be calibrated. The following tools are applicable when the calibration procedure is carried out:

- Ballpoint Pen
- Drill Tool

- RM-knife
- Static Knife

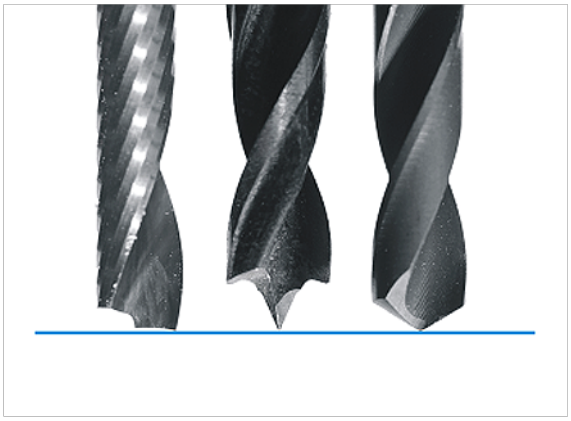
Procedure

- The calibration wizard is initiated from Option->Table Option->Calibrate Measuring pad.
- The Measuring pad calibration dialog appears.
- Follow the instructions in the wizard to complete calibration.

Indication that the calibration sequence is active

- A calibration sequence is indicated by:
- Continuous light in the laser pointer.
- Start button light is blinking.
- Stop button light is off.

11.11.2 Tool depth and X-pad



Be aware how X-pad is working; it is the tool tip that is measured.

Depending upon the actual tool, it might be necessary to add depth in order to achieve cut or drill hole through the material.

Additional depth is entered in two ways:

1. The general depth of a tool is entered in the Tool height wizard available from the Tool Configuration menu (98).
2. The depth for a certain material or job is entered in the Job setup dialog (87).

11.11.3 Limitations

The following tools can be measured using X-pad:

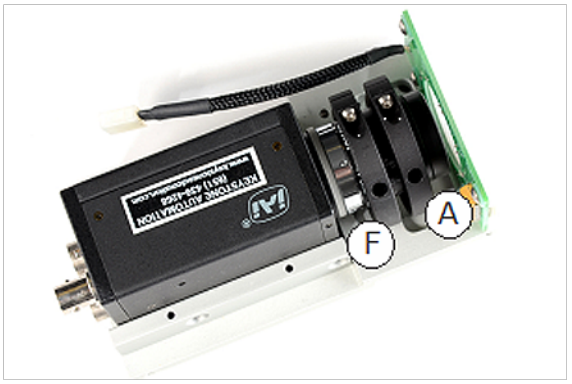
Ballpoint Pen	HD Crease	MP HF Knife	V-notch Knife

Bevel Knife	HD Knife	Reciprocating Knife
Crease	MultiCUT	RM Knife
Drill Tool	MultiCUT-HP	

The following tools will not be measured:

Foam Knife	Ink Tool	MicroCut	RotaCut
FoamHead	KissCut	Recycled Knife	Static Knife

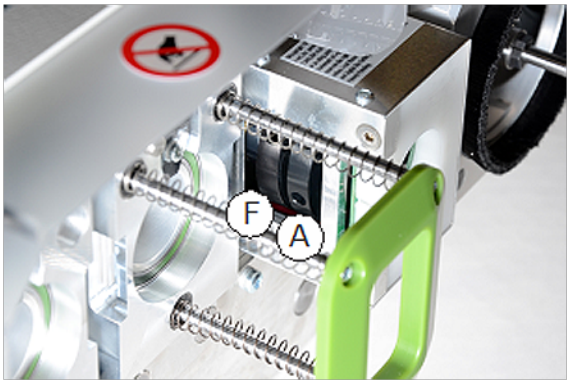
11.12 Camera



Two adjustments are available:

A - adjust the aperture.

F - adjust camera focus.



Note:

When adjusting i-cut camera on MultiCUT/ MultiCUT-HP, the adjustment knobs are available in between the knife foot, as illustrated in the picture.

Before any adjustments are carried out, remove the knife from this tool position.

12. Tool inserts

Knife Blades are extremely sharp.

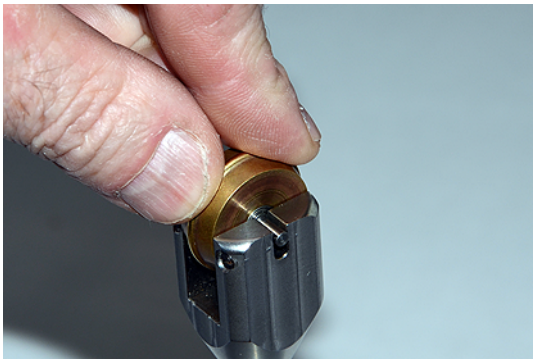
Take care when handling Knife Tools.

12.1 Crease tool

Crease tool

The Crease tool is a multipurpose tool allowing a wide range of creasing wheels.

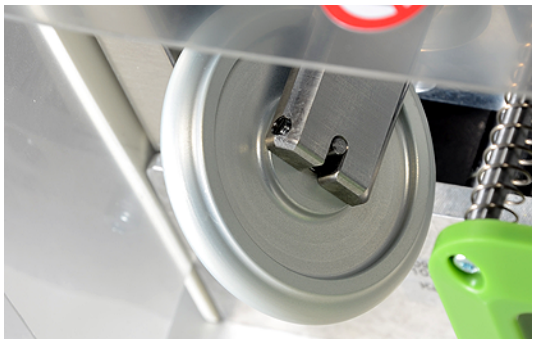
Replace crease wheel



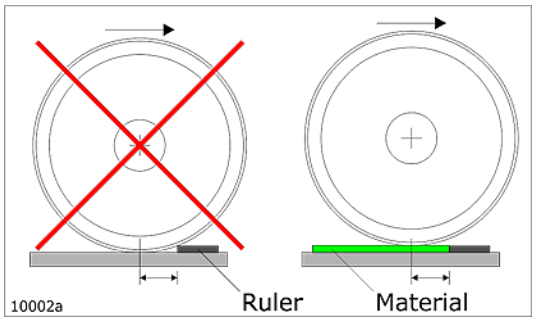
Push the wheel into position

12.2 Crease tool, 60 mm

Use the ø60 mm crease tool to avoid cracking the liner.



The crease wheel is attached to the tool after it has been mounted in the tool head.



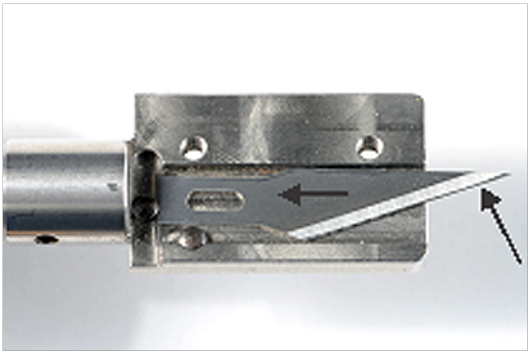
Note:

When working with thin materials, avoid crease close to the ruler.

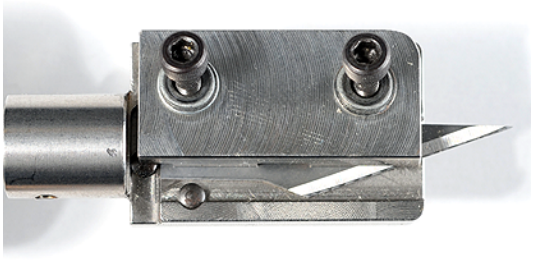
12.3 Static knife tool

The Crease tool is a multipurpose tool allowing a wide range of creasing wheels.

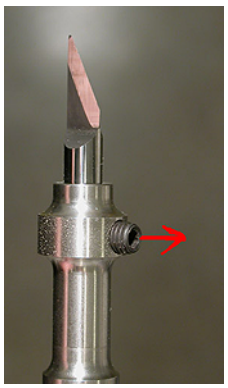
Insert knife blade



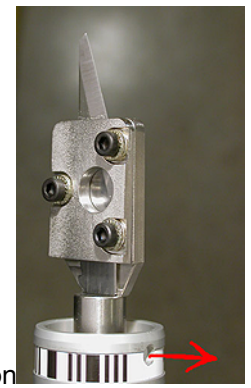
After a blade change, the tool depth should be checked again.



Knife direction



The locking screw will always point towards the cutting direction

The locking screw will always point towards the cutting direction 

12.4 Reciprocating knife tool

The VibraCut knife tool is available in two models:

VibraCut knife tool

Running with 6000 RPM and amplitude +/- 0.15 mm (0.006 inches), this tool is recommended for light duty corrugated materials.

MP High Frequency VibraCut knife tool

Running with 12000 RPM and amplitude +/- 0.6 mm (0.024 inches), this tool is recommended for more demanding corrugated materials.

Note: Hearing protection is recommended when working with this tool.

Common to both models:

- To reduce material tear, a foot is available.
- The same set of knife adapters can be used.

Replace knife blade

Pull out the electrical connection.

Note: Pull using the connector, not just the cable.

Remove the foot by pulling the foot straight out.

Loosen the screw A and replace the knife.

Ensure the knife has correct position relative to the screw.

Push the knife down while the screw is fixed.

Extreme care should be taken when inserting the knife foot again.

Keep fingers away from knife as illustrated at left.

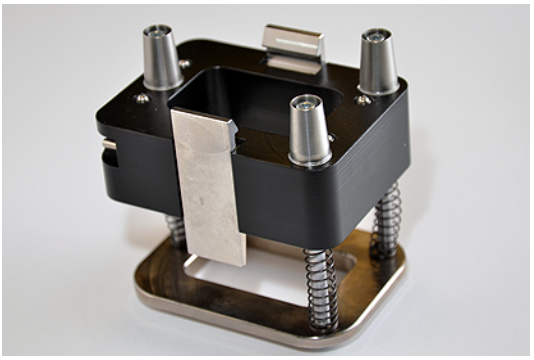
Tool adjustment

For this tool, complete the following adjustments:

Parameter	Description
Lag setting	The knife lag depends upon the blade adapter. Nominal value is 0-3 mm.
Tool height	The tool tip should touch the material surface.
Tool rotation	Adjust tool angle tangential to moving direction.
Center Offset	Adjust tool sideways until centered.
Tool Offset	Adjust offset relative to laser pointer.

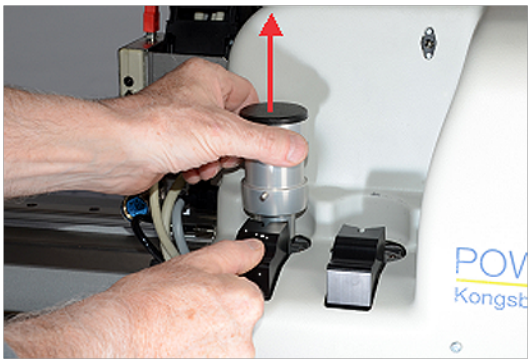
For more information about how to run the adjustment wizards, see the Tool Configuration chapter (jhbe)

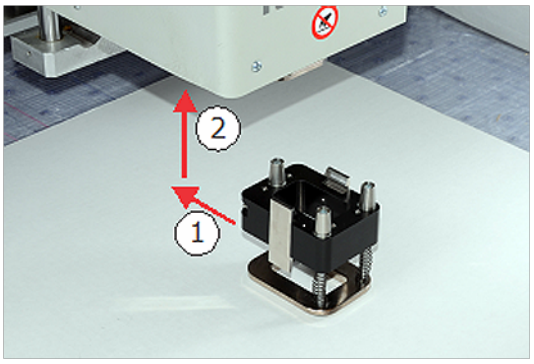
12.5 Detachable material foot



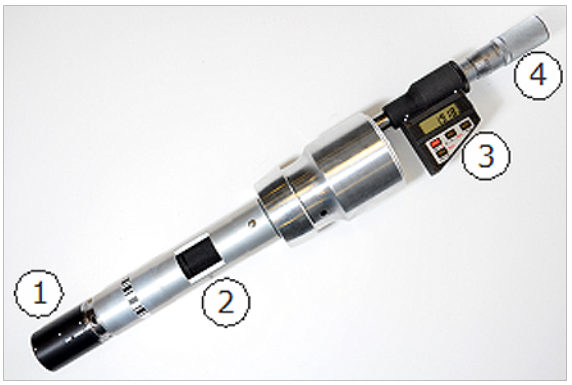
The detachable material foot is mounted in a standard FlexiHead tool position where a material hold down function is required.

How to mount the detachable material foot





12.6 MicroCut tool



The MicroCut tool is a special purpose knife tool for applications where exact cutting depth is required.

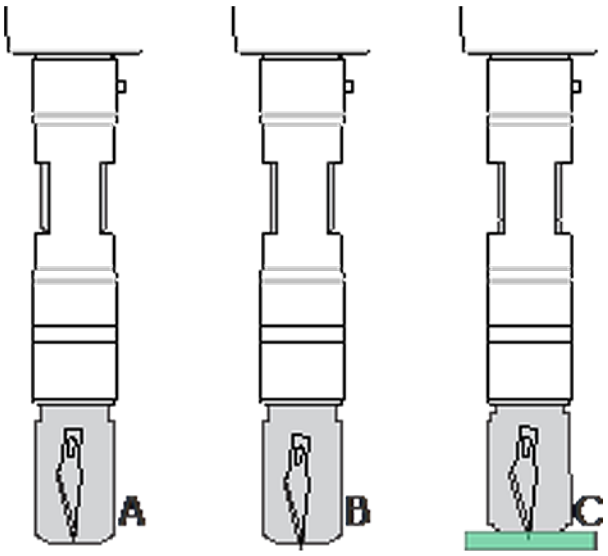
1 – Foot, floating on top of the material

2 – Foot pressure adjustment

3 – Depth meter. For details, see (218).

4 – Depth adjustment

How to set Cutting Depth



- When inserting a new knife blade, align the tip of the knife with the sliding sleeve and zero the depth meter (A).
- Then adjust the micrometer screw (Starret micrometer (218)) until desired depth is displayed (B).
- During execution, the foot is floating on top of the material. To adjust the foot downward pressure, adjust the Foot pressure screw.
- The pressure should be high enough to ensure good contact between the foot and the top of the material, without scratching the material.

Note: To secure good contact between the foot and the top of the material, the foot should be lifted 1 – 1.5 mm (0.4 – 0.6 in) during execution (C). (Tool height adjustment).

How to Change Knife Blades

1. Remove the knife tool from the tool head.
2. Remove the sliding sleeve from the tool.
3. The knife blade is held by a hex-screw. A 1.5 mm key will fit.
4. Loosen the hex-screw and insert the new blade.
5. When inserting the new blade, please make sure that:
   a. The back of the knife blade is aligned along the reference edge of the blade socket. (To ensure blade perpendicularity).
   b. 3 mm of the blade protrudes from the blade socket (X-acto #11).
6. Tighten the hex-screws and reattach the knife tool.

12.7 Foam knife

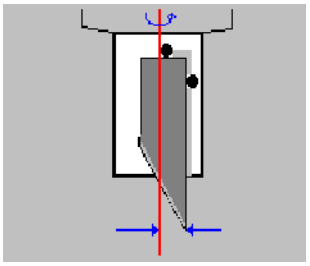
The Foam Knife tool for FlexiHead is a special purpose tool for foam cutting materials up till 1" (25 mm).

The tool is available for all XL tables with raised traverse.

Note:

- As the Foam Knife tool is longer than the other tools in the tool head, it is not possible to run the Foam Knife tool in combination with other tools in the tool head.
- It is not recommended to have the Foam Knife tool in the tool position where the measuring foot is located.

Lag adjustments for Foam Knife



The lag for the Foam Knife tool should be 2.5mm (0.1")

How to replace a knife blade

Follow instructions for *Static knife tool*.

12.8 Bevel knife

The Bevel knife tool is a special-purpose tool for 45 degree angled cuts.

Lag = 3.5 mm / 0.14 in.

How to replace a knife blade

- Loosen the two screws holding the blade clamp.
- Pull out the old knife blade.
- Insert the new blade.
- Ensure the blade align exactly with the alignment pins.
- Fix the blade clamp.

At left, the clamp is removed just to show how to align the knife blade.

After a blade change, the tool depth should be checked again.

How to set the depth of the Bevel knife

The default depth of the Bevel knife is cut through the entire material.

Define the depth of the Bevel cut in the **Option->Job Setup (CTRL+J)**

Normally the cut should extend down to just above the bottom liner closest.

About tool adjustment

For the Bevel knife, we recommend the manual procedures for tool rotation and centre offset adjustment.

Use a thin folded carton material when adjusting tool rotation and centre offset.

Remember that you should look at the bottom side of the material for correct alignment.

The adjustments depend upon the actual material due to weight, structure and thickness.

For optimal result, a fine tuning of the adjustments in the actual material should be carried out.

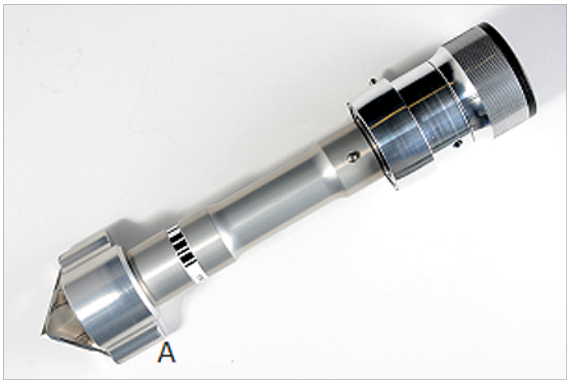
12.9 Bevel knife U20

The Bevel knife tool is a special-purpose tool for 20 degree angled cuts.

Lag = 1.5 mm / 0.06 in.

For proper operation, follow instructions for *Bevel knife*.

12.10 VI45 - Rigid Board insert



A – knife adapter

Lag = 0mm.

How to mount the Rigid board insert tool

Remove the knife adapter from the tool and insert the upper part into the tool position.

Position the tool adapter onto the shaft.

Observe Alignment pin orientation.

Keep the knife adapter in this position while you turn the tool shaft…

…in order to lock the tool adapter in its position.

12.11 KissCut knife tool

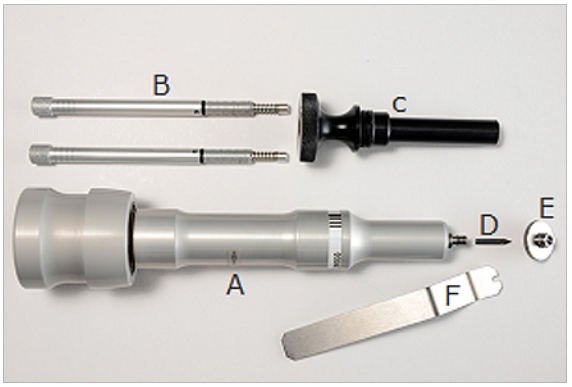
The KissCut tool is a special knife tool for vinyl cutting.

The cutting depth is controlled by the downward knife pressure.

For applications where a more accurate depth control is required, a simple foot solution is available.

The tool is prepared for a wide range of knife blades.

Description



A complete KissCut tool consist of:

A - The tool body with knife adapter

B - Pressure unit no x (two models available)

C - Locking knob

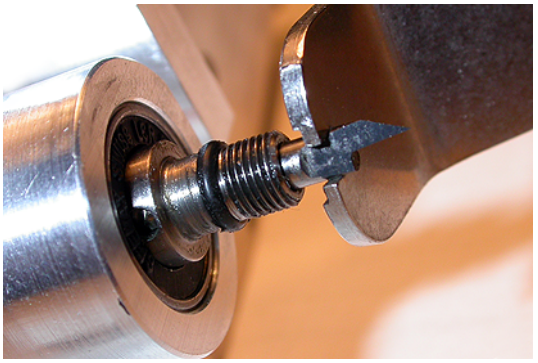
D - Knife blade

E - Knife foot

F - Spanner

Replace knife blade

This figure shows how the knife is fixed inside the KissCut knife tool.



A special hand tool is available as an aid when replacing knives. Use this hand tool when removing and inserting knives into the tool.

The friction between the alignment pin A and the knife blade keeps the blade in place.

When inserting a new knife blade, ensure the blade is correctly positioned relative to the alignment pin.

Tool pressure

Knife pressure is adjusted by turning the Pressure unit knob available on top of the KissCut tool.

Adjust and make a test cut to obtain correct setting.

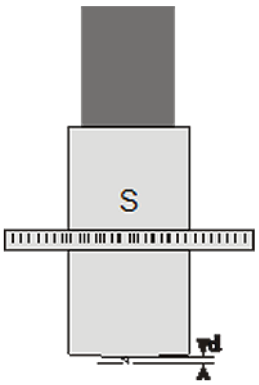
If higher knife pressure is needed, interchange Pressure units.

Pressure range:

Pressure unit #1: 0,3 - 3,5 N

Pressure unit #2: 0,8 - 7,5 N

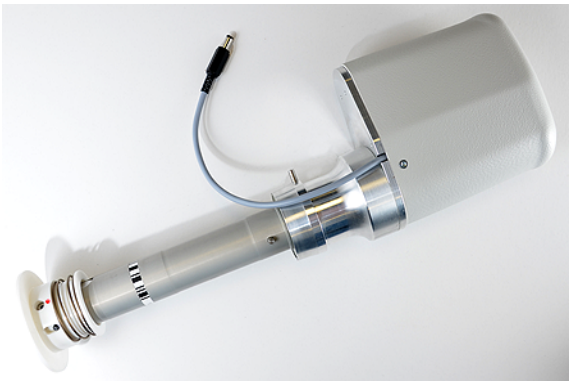
Foot solution



Normally, the KissCut knife tool is used without the foot mounted.

When the foot is mounted, the cutting depth d is controlled by the adjustable screw S.

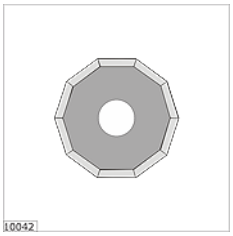
12.12 RotaCut knife tool



The RotaCut knife tool is a special tool for cutting light materials, as thin fabric. Maximum cutting depth is 2 mm / 0.07 inch.

Note: Due to the characteristics of this knife tool, some restrictions apply to the use of it:

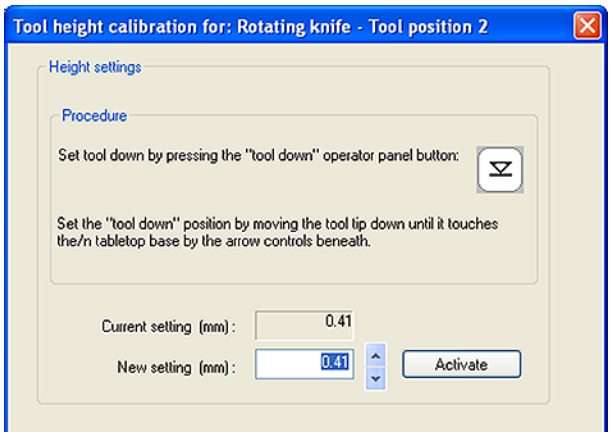
- It is not suitable for curves with small diameter.
- It is not suitable for designs containing short lines in combination with sharp angles.



The RotaCut knife tool is prepared for Decagonal knife blades, ø25 mm / 1 inch.

Tool adjustment

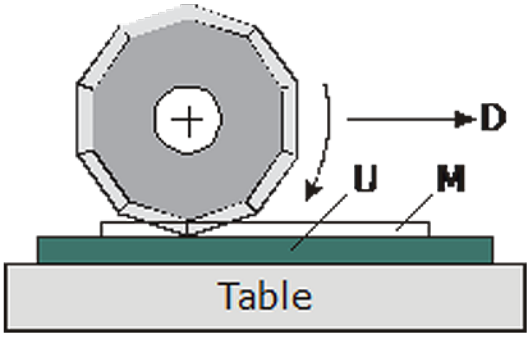
The RotaCut knife tool is adjusted in the same way as the other XN tools regarding rotation angle and offset, but tool height is manually adjusted:



Tool height

Tool height for RotaCut is manually adjusted using the tool height adjustment wizard available from the **Tool configuration** dialog.

Follow the instructions in the dialog.



Be careful, though, not to adjust the cutting depth too deep into the cutting underlay (figure at left).

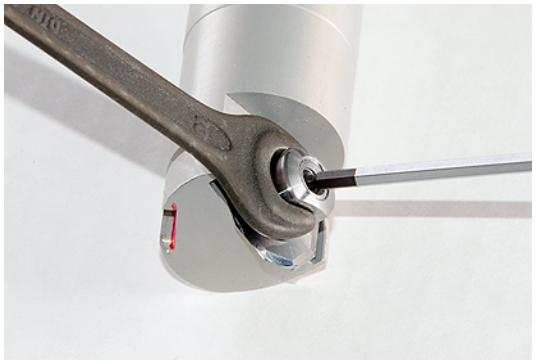
U - cutting underlay M - material D - X/ Y moving direction

For more information about how to run the adjustment wizards, see the **Tool Configuration** chapter

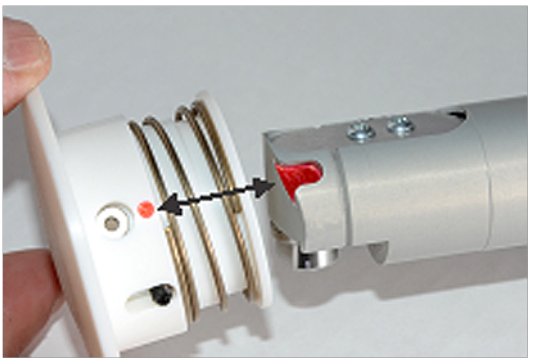
How to replace the knife blade

Carefully put the decagonal blade onto the shaft.

Ensure the blade is properly seated. Mount the nut.



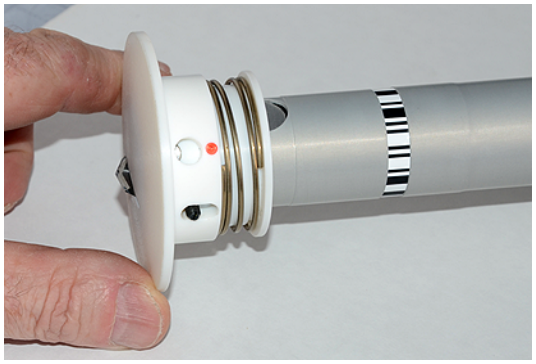
Use the spanner and the hexagonal screw driver to fix the blade properly.



Observe the alignment pin in the foot and the groove in the tool shaft.

Position the foot onto the tool shaft as shown at left.

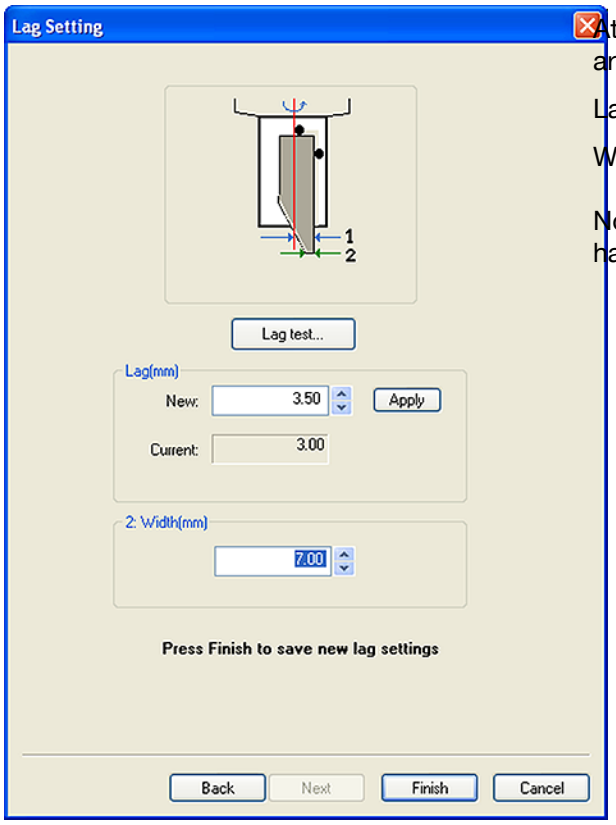
Note: This operation has to be carried out after the tool insert is in place in the tool head.



Push the foot into position. A self-locking mechanism ensures the foot is kept in place.

Note: Be careful not to hit the sharp knife.

Tool setup for RotaCut

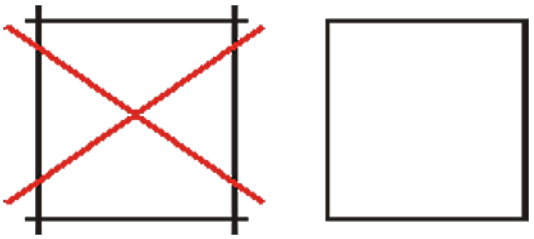


At left, correct setting of Lag- and Width - values are shown.

Lag = 3.5 mm / 0.14 inch

Width: 7.0 mm / 0.28 inch

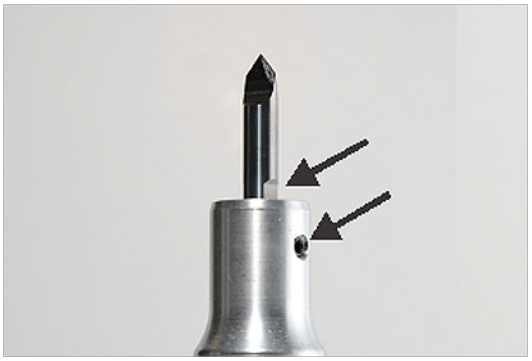
Note: After modifying these values, the input-file has to be re-opened.



Use the lag and width parameters to achieve proper corner cutting.

12.13 RM knife tool (Rigid material)

Insert / remove knife blade



Ensure the blade is correctly aligned.

Use a 3 mm Allen key to fix / loosen the knife blade.

After a blade change, the tool depth should be checked again.

Tool adjustment

Use the standard adjustment wizards when adjusting the knife.

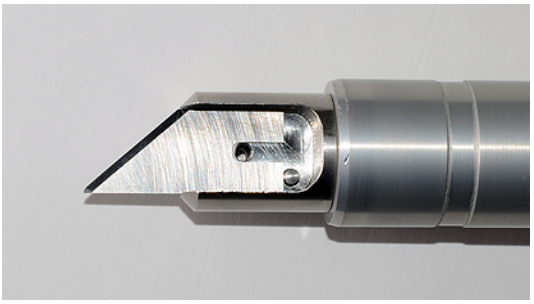
We recommend using a sheet of corrugated material, 5-6 mm / 0.2 inch, when executing the wizards.

Parameter	Description
Lag setting	The knife lag depends upon the blade adapter. Nominal value is 0-4 mm.
Tool height	The tool tip should touch the material surface.
Tool rotation	Adjust tool angle tangential to moving direction.
Center Offset	Adjust tool sideways until centered.
Tool Offset	Adjust offset relative to laser pointer.

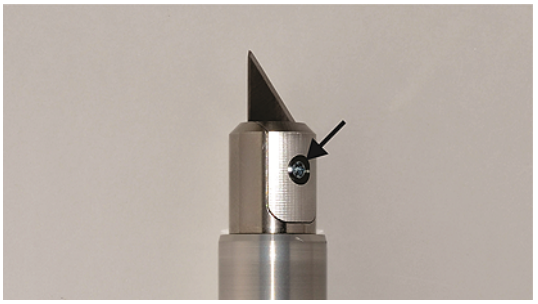
For more information about how to run the adjustment wizards, see the Tool Configuration chapter

12.14 RBI90-16 knife tool (Rigid board insert)

Insert / remove knife blade



Ensure the blade is correctly aligned.



Use a 3 mm Allen key to fix / loosen the knife blade.

After a blade change, the tool depth should be checked again.

Tool adjustment

Use the standard adjustment wizards when adjusting the knife.

We recommend using a sheet of corrugated material, 5-6 mm / 0.2 inch, when executing the wizards.

Parameter	Description
Lag setting	Lag = 8.5 mm / 0.33 in.
Tool height	The tool tip should touch the material surface.
Tool rotation	Adjust tool angle tangential to moving direction.
Center Offset	Adjust tool sideways until centered.
Tool Offset	Adjust offset relative to laser pointer.

For more information about how to run the adjustment wizards, see the Tool Configuration chapter

12.15 Drill tools

12.15.1 Flexi Drill Tool

How to replace a drill bit

Push the drill bit towards the bottom of the collet.

Use the wrench to fix the bit in the collet.

After a bit change, the tool depth should be checked again.

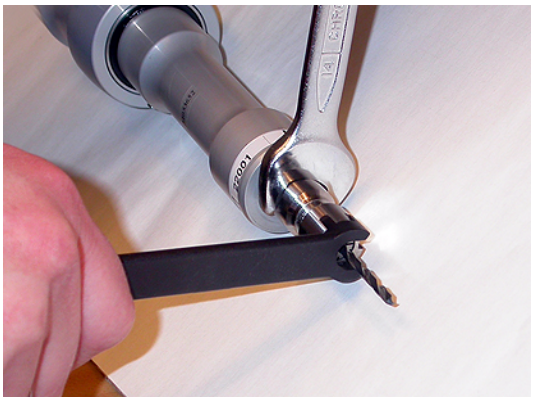
12.15.2 Reboard Drill Tool

The Drill tool is a tool insert for a standard XL tool position.

This drill tool is for use in re-board and other paper - based materials. The tool is prepared for drill bits 0.5 – 6 mm (0.02 - 0.24 inches).

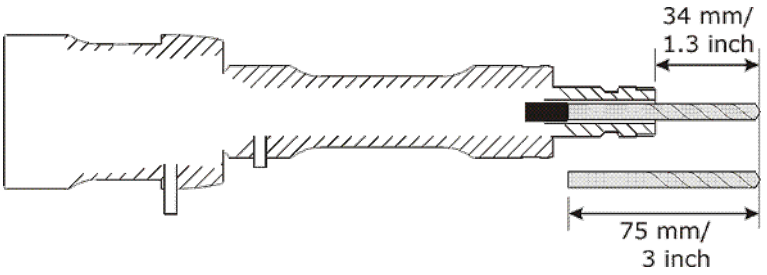
The motor RPM is adjustable from 100 - 1000, specified in Job setup. Inside one job, only one RPM is available. If different RPMs are specified, the highest value will be used.

How to replace a drill bit



After a bit change, the tool depth should be checked again.

12.15.3 Drill bit dimensions



This figure shows the drill bit requirements for the tool to operate properly.

12.15.4 Tool adjustment

For this tool, complete the following adjustments:

Parameter	Description
Tool height	The tool tip should touch the material surface.
Tool Offset	Adjust offset relative to laser pointer.

For more information about how to run the adjustment wizards, see the Tool Configuration chapter

12.15.5 Drill tool in ArtiosCAD

ArtiosCAD has functions for Drill Tool in Sample Making, see Service Guide for ArtiosCAD – Kongsberg integration available on the XN documentation DVD.

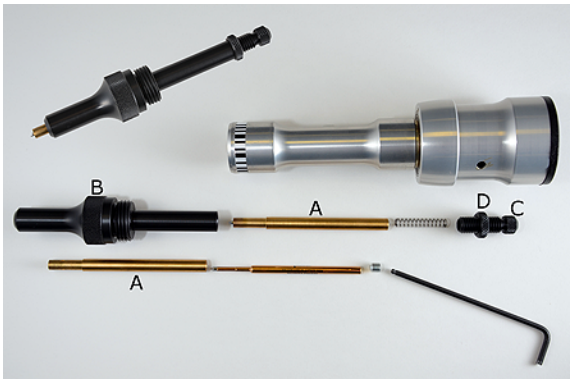
12.16 Ball point pen

The Ball point pen tool is available for pen drawing.

Tool pressure is adjustable by a knob on top of the tool.

The Ballpoint Pen tool is prepared for Space Pen refills.

Tool assembly and pressure adjustment



A - Inner sleeve.

The ball point pen refill is fixed inside the sleeve using a screw. Use Allen key, 3 mm.

B - Sleeve holder with spring and pressure adjustment knob.

Adjust tool pressure using the screw C.

Lock the adjustment screw using the locking knob D.

Tool adjustment

For this tool, complete the following adjustments:

Parameter	Description
Tool height	The tool tip should touch the material surface.
Center Offset	Adjust tool sideways until centered.
Tool Offset	Adjust offset relative to laser pointer.

For more information about how to run the adjustment wizards, see the Tool Configuration chapter

12.17 Ink tool

Two ink tool models are available; Liquid ink tool and Fibertip tool.

12.17.1 Liquid ink tool

The Ink Tool is for ink drawing on foil. The tool is prepared for Staedtler 727HPK35-9 insert.

Ink tool assembly

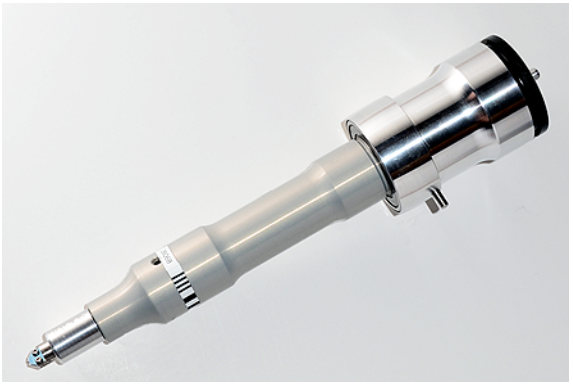
12.17.2 Fibertip tool

The Fiber Tip tool is for ink drawing.

The tool is prepared for Staedtler Lumocolor insert.

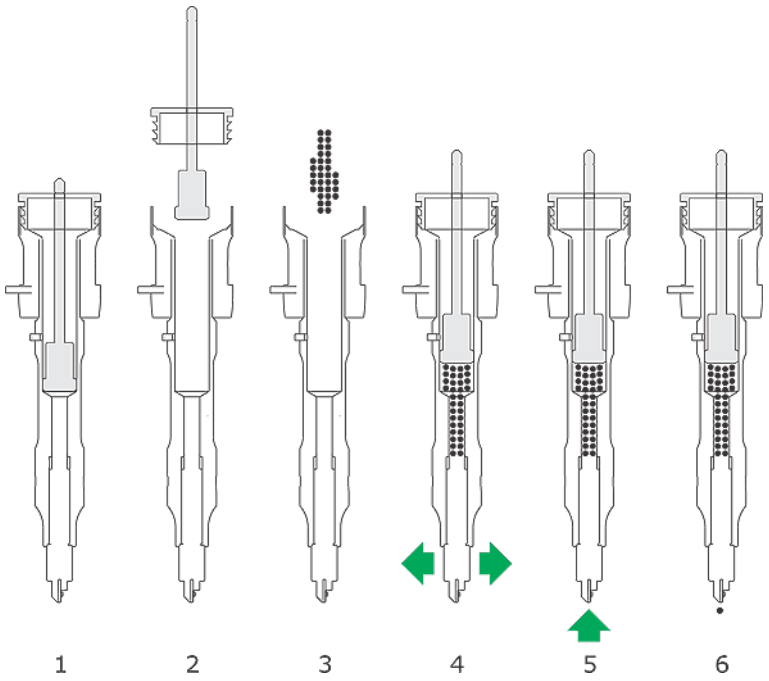
Fibertip tool assembly

12.18 Braille tool



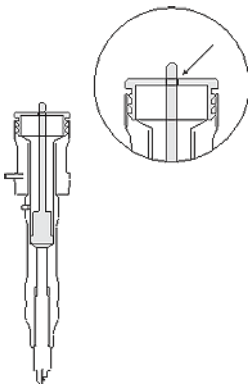
The Braille Tool for XL/XN cutting tables will enable you to create signage readable by visually impaired people.

Braille Tool, how to add spheres



1. Keep the tool in upright position during this process.
2. Remove the cap and the plunger.
3. Pour spheres into the tool.
4. Insert the plunger and the cap. Shake the tool lightly.
5. Push the dispensing mechanism up.
6. One sphere should be pushed out from the tool

Plunger



The tool is equipped with a plunger that serves two purposes:

1. To force the spheres into the internal funnel.
2. Indicate the number of spheres remaining in the tool. If the groove is no longer visible it means that there is a limited number of spheres left in the tool.

Braille tool milling bit

The supplied milling bit is heavily unbalanced and should not be run faster than 20.000 RPM to avoid excessive wear to the milling spindle!

This also means that you should not use this bit when warming up the milling spindle as the warm up sequence exceeds 20.000rpm.

Braille tool setup

In order to create high quality consistent braille patterns you should perform tool height and tool offset calibrations.

Before adjusting offset you should set the tool height of the braille tool. This can be done manually or automatically using X-Pad.

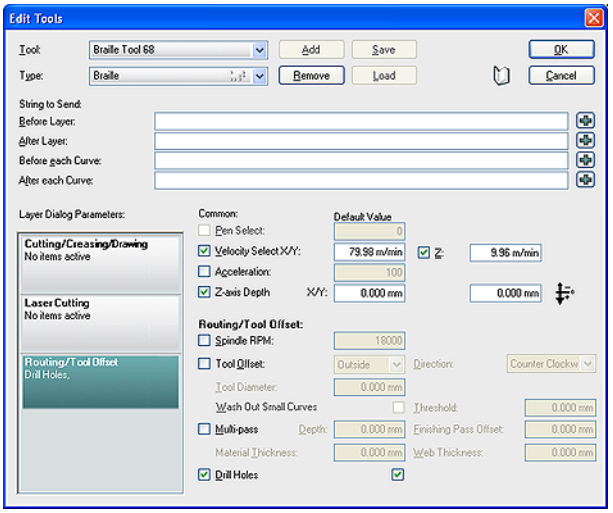
Tool offset adjustment

	Machine Connection->**Tool Configuration**

1	Load the braille tool with black spheres.
2	Cut a piece of double sided tape measuring approximately 20x20 mm / 0.8x0.8 in. and stick it to the surface of the working area. Preferably the milling underlay or your selected substrate. It is important that the piece of tape fits within the hole in the measuring foot with good margins.
3	Insert the Braille tool in the MultiCUT tool head.
4	Open up the tool adjustment dialog.
5	Select the Braille Tool and press **Adjust active tool…**
6	Select **Tool Offset Adjustment** and press **Next**.

7	Jog the tool head to the position of the tape so that the laser dot is placed in the middle of the piece of tape.
8	Press *Start*. The machine will measure the material thickness and dispense a sphere onto the tape piece.
	If the laser dot is offset from the sphere, jog the tool head until the laser dot is placed exactly on top of the sphere.
10	Click **Finish** and close the remaining tool adjustment dialogs.

i-cut Vision



A standard configuration for Braille is included with i-cut version 7.2.1.

If not available, the Braille Tool should be defined in the Edit Tools dialog with the following parameters enabled:

- Velocity Select Z (max speed)
- Z-axis Depth (0)
- Drill holes (on)

Creating a braille job file

Braille grade 1 & 2

Grade 1 braille is a letter-by-letter translation of texts.

If you wish to create Grade 1 braille signage you can use any available braille font. These fonts may be freely available on the internet.

Grade 2 braille introduces abbreviations and contractions for a large number of commonly used words.

This is the recommended/preferred method of creating braille texts.

For Grade 2 braille you will need dedicated translation software.

Translation software recommendations can be found in the Raster Braille manual supplied with the Braille Tool.

Operations in the desktop publishing software

To create the Braille patterns select the Braille font and type the text.

Select a font size, which gives correct distance between the dots/patterns. Details are found in the Raster Braille manual.

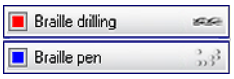
As with other fonts, outlines of the text need to be created before creating the output file for i-cut Vision.

Since the Braille patterns should be drilled with the MultiCUT spindle as well as Braille spheres being inserted with the Braille tool it is recommended to duplicate the Braille layer. This can also be done in i-cut Vision.

Keep other graphics than Braille in separate layers.

Using the Braille tool with i-cut

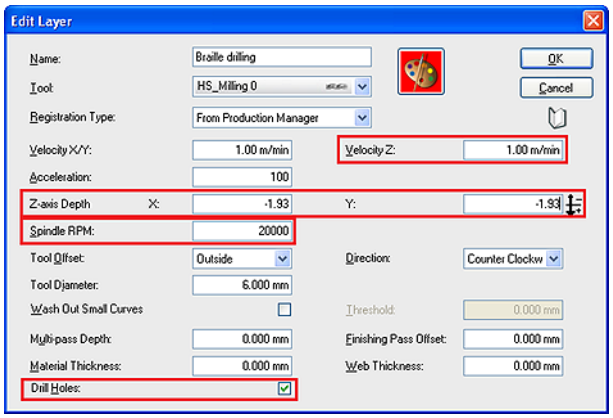
Preparing layers



When making braille signage you need two identical layers with the braille pattern, one for milling holes and one for inserting braille spheres.

These layers may consist of circles or points.

Layer: Braille drilling (MultiCUT/MultiCUT-HP)



Velocity Z

Velocity Z is material dependent and may require experimentation.

The value shown in the illustration below is suitable for (and has been tested with) 3mm Dibond.

Z-axis depth

Z-axis depth is determined by the material thickness and hole depth.

It can be calculated as: Z-axis depth = hole depth – material thickness.

According to the Raster Braille manual the hole depth should be 1,07mm (0,042”).

You may find that the holes being milled are either too shallow or too deep. If so, use this parameter to adjust to a suitable setting.

You will see this if the spheres sit too low or too high.

The standard specifies a sphere height of 0,6mm (0,023”).

Example using 3mm Dibond: 1,07mm – 3mm = -1,93mm

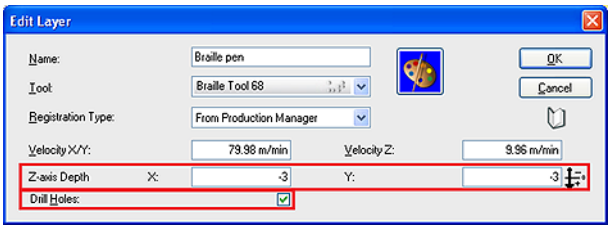
Spindle RPM

Spindle RPM is material dependent and may require experimentation. The values shown in the illustration below are suitable for 3mm Dibond.

Drill holes

Drill holes check box should be enabled.

Layer: Braille pen (Braille Tool)



Z-axis Depth

Z-axis depth should initially be set to the material thickness.

This parameter determines the pressure the Braille Tool will use to force the sphere into the hole.

If you are using soft materials and notice indentations in the material you can lower the value to get a lighter pressure.

On the other hand, if the spheres are not fully inserted into hard materials (like acrylic) you may increase this value to increase the force used by the Braille Tool.

Drill Holes

Drill Holes check box must be enabled for the Braille Tool to work properly.

i-cut Vision limitations

If other milling operations with other milling bits are required in the same job, the job should be run twice with different layers active.

Actions are required in order to execute the job twice in same position. (E.g. use a reference rectangle encompassing the entire design and run this layer with the laser pointer).

13. Machine Configuration

See **iPC User Manual** for details.

14. Maintenance

More information about maintenance is available in the **Maintenance Manual**.

Warning

Main Power should be switched off before cleaning is carried out.

14.1 Daily maintenance

- Inspect the equipment in order to prevent any irregularities.
- The table surface should be kept clean at all times.
- The room should be cleaned regularly.
- Use a vacuum cleaner to keep the inside of the conveyor belt clean.

14.2 Weekly maintenance

The guide-ways and the bearings should be thoroughly cleaned and oiled very lightly.

The automatic draining action of the air pressure reduction valve should be controlled:

- Switch off the air compressor and allow the air pressure to fall.
- Switch on the air compressor and check that any water in the glass bowl of the pressure reduction valve drains out automatically during the first few seconds of operation.
- Remove and clean the bowl if the automatic draining action does not operate or if it appears to be an excessive amount of dust in the bowl.

14.3 Maintenance, external equipment

All external equipment, as PC, Vacuum pump and compressor should be maintained according to the User Manual for the actual equipment.

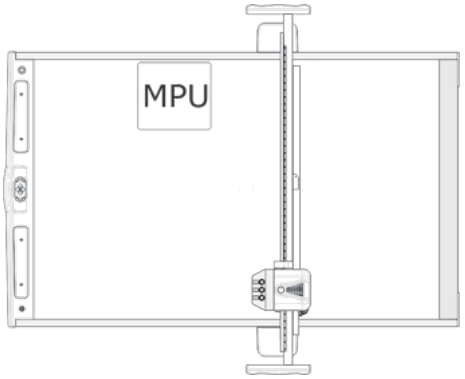
15. Fuse replacement

Before starting the Fuse Replacement procedure:

- Switch **Power Off** using the **Main Power Switch**
- Remove the **Main Power** plug from the wall socket

15.1 MPU fuses

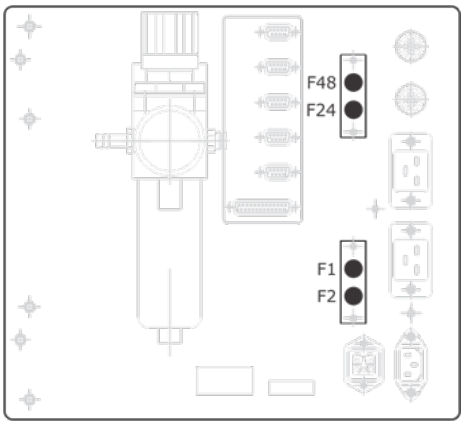
MPU Location



Note: MPU location is model dependent.

All fuses are located on the rear side of the Main Power Unit (MPU).

Fuse Location



Procedure

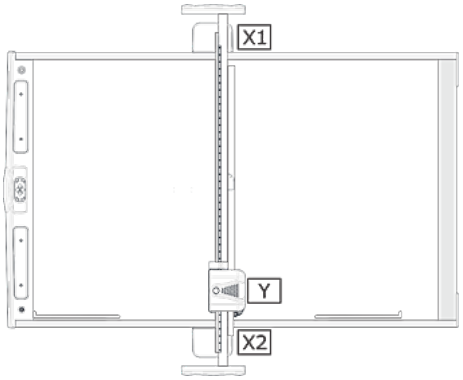
1. Remove frame cover in front of MPU
2. Remove the metal shield covering F1/F2, F24/F48.
3. Remove one fuse, check with ohm – meter. If blown, replace with a new, identical fuse.
4. Repeat for each fuse.
5. Replace base cover.
6. Insert main power cable into the wall socket and turn main power ON

Fuse Details

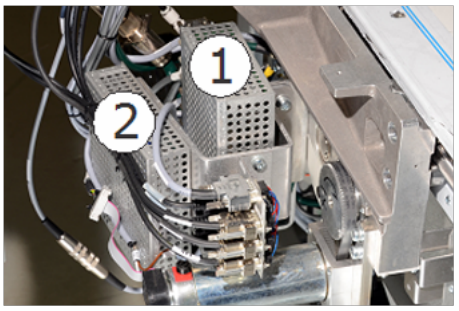
Fuse location	115V	230V
F1 and F2, line fuses	T 10A 250V (5x20 mm)	T 5A 250V (5x20 mm)
F24, +24V fuse	T 6,3A 250V (5x20 mm)	T 6,3A 250V (5x20 mm)
F48, 48V Servo power fuse	T 15A 250V (5x20 mm)	T 15A 250V (5x20 mm)

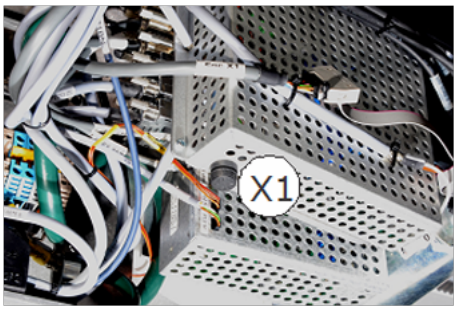
15.2 X1 fuses

X1 Amplifier Location



Fuse Location





1 – SCU unit

2 – 6/12A amplifier X1

Procedure

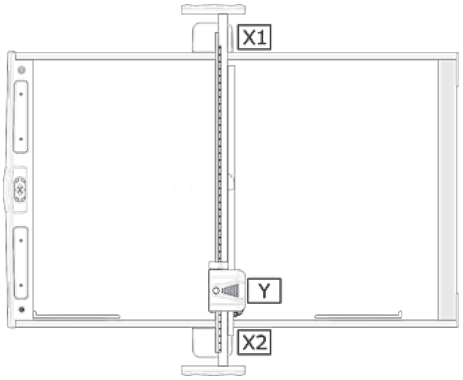
1. Remove X1 cover.
2. Check the X1 fuse with ohm - meter. If blown, replace with a new, identical fuse.
3. Replace covers.
4. Insert main power cable into the wall socket and turn main power ON.

Fuse Details

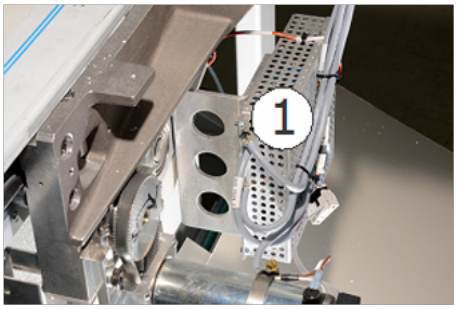
T 8A 250V 1 1/4 x 1/4 in. (6,3 x 32 mm)

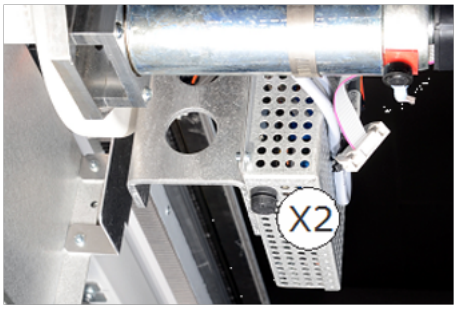
15.3 X2 fuses

X2 Amplifier Location



Fuse Location





1 – 6/12A amplifier X2.

Procedure

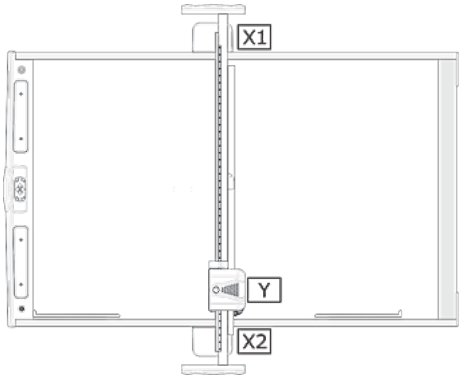
1. Remove X2 cover.
2. Check the X2 fuse with ohm - meter. If blown, replace with a new, identical fuse.
3. Replace covers.
4. Insert main power cable into the wall socket and turn main power ON.

Fuse Details

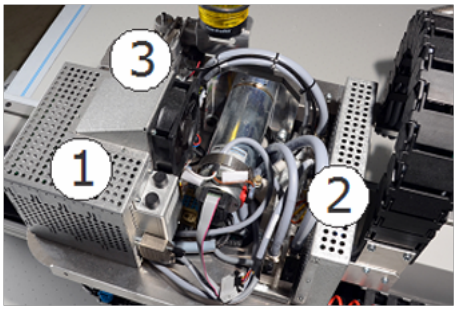
T 8A 250V 1 1/4 x 1/4 in. (6,3 x 32 mm)

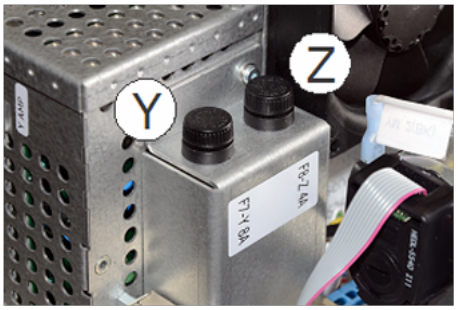
15.4 Y/Z fuses

Y Amplifier Location



Fuse Location





1 – Y-amplifier unit

2 – TCU

3 – Z-axis motor

Procedure

1. Remove Y cover.
2. Check the Y and Z fuse with ohm - meter. If blown, replace with a new, identical fuse.
3. Replace covers.
4. Insert main power cable into the wall socket and turn main power ON.

Fuse Details

Name	Fuse
Y	T 8A 250V 1 1/4 x 1/4 in. (6,3 x 32 mm)
Z	T 4A 250V 1 1/4 x 1/4 in. (6,3 x 32 mm)

15.5 Tool Rotation/Reciprocating knife fuses

Fuse Location

Procedure

1. Fuses are available from beneath the Toolhead cover.
2. Remove fuse F9 or F10 and check with ohm - meter. If blown, replace with a new identical fuse.
3. Insert main power cable into the wall socket and turn main power ON.

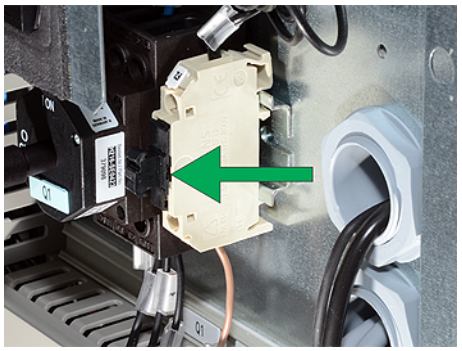
Fuse Details

Name	Fuse
F9	T 2A 250V 1 1/4 x 1/4 in (6,3 x 32 mm
F10	T 2A 250V 1 1/4 x 1/4 in (6,3 x 32 mm

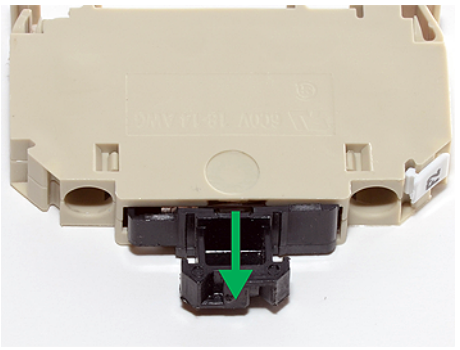
15.6 Chiller fuse

Remove the on/off button

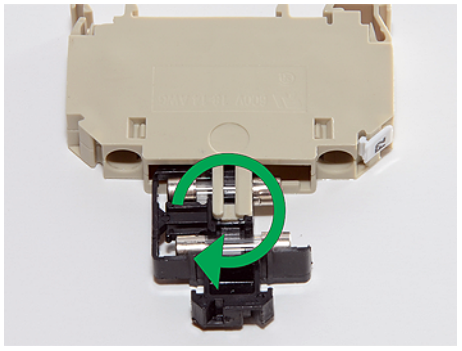
Remove cover (4 screws)



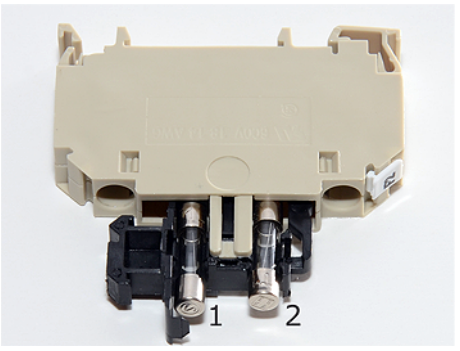
Fuse location



Pull out the fuse holder



Turn the fuse holder 90 deg.



Now you have easy access to the fuse.

1 - Spare fuse

2 - Fuse in action

Fuse: T 1A 250V (5x20 mm)

15.7 Heater for Chiller Fuse

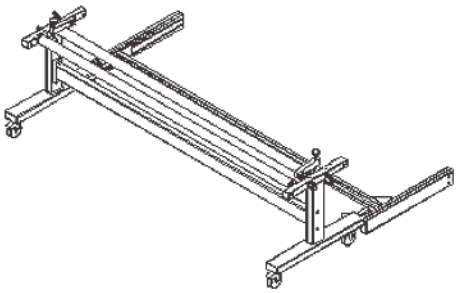
Heater Fuse Location

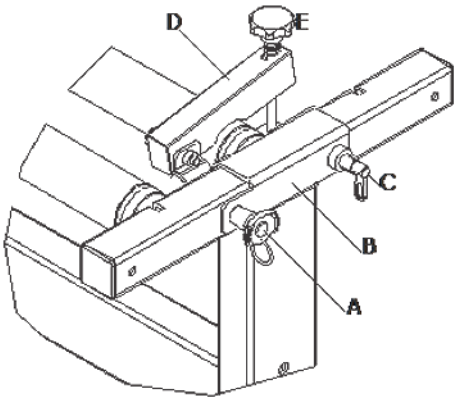
The **Fuse** is available inside the connector cover.

Fuse details

F - 4A 250V T 5x20mm Slow Blow (42448944)

16. Roll Feeder





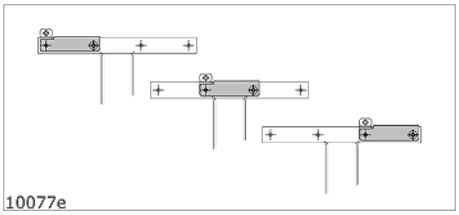
A – **Bracket Position Pin** (push the center button to release the lock).

B – **Roll Holder Bracket**.

C – **Brake Position Locker**.

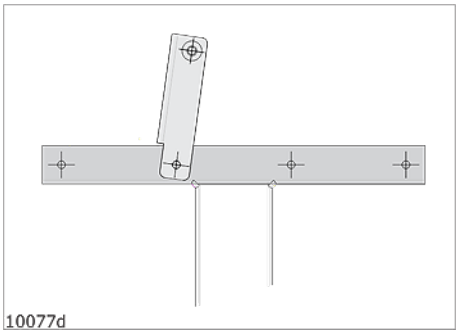
D – **Roller Brake**.

E – **Brake Tension** adjustment. Turn clockwise to increase tension.



To adapt to different roll sizes, three **Roll Holder Positions** are prepared.

To move the roller bracket, remove pin (A) and release locker (C).



To disengage the **Roller Brake**, release the **Brake Position Locker** (C) and tilt the bracket.

17. Vacuum Cleaner use

17.1 Introduction

1 – **Filter Chamber**

2 – **Filter Shaking Lever**

3 – Removable **Material Container**

Note:

Carefully observe the **Vacuum Cleaner** filling level.

If the **Vacuum Cleaner** container is filled up completely, the dust removal function will stop with a high risk for **Spindle Motor** damage.

17.2 Filter Shaking

Filter Shaking is important in order to maintain a good **Vacuum Cleaner** performance.

Filter Shaking is best operated every time before use and after prolonged operation.

Note: This operation must be performed only when the **Vacuum Cleaner** is switched off and the motor has stopped.

17.3 Remove Material Container

1

2

3

Note: You can use the container with or without **Plastic Bag**.

17.4 Use Plastic Bag in Material Container

Parts needed: Steel ring and plastic bag

Ring and **Plastic Bag** ready for the container

Fix the **Plastic Bag** to the ring in this way

Fold/fix the **Plastic Bag** around the container

Container with **Plastic Bag** ready for operation

Detailed information about how to operate the **Vacuum Cleaner** is available in the Zefiro 75 Operators and maintenance manual.

18. Install Software

For information about software installation, see the **Installation Manual** for the actual machine. Available on the Documentation DVD.

19. Frequently Asked Questions

19.1 Machine

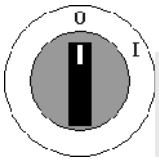
My machine does not react when switching on

Please check electrical connection, do you have 230V? Is there enough compressed air, 7bar?

Check all main fuses in the MPU, see *Fuse Replacement*

Check all connections at the MCU behind the control panel

Check all connections at the start up button and the emergency buttons:



Safety system won't reset

Make sure all sensors are aligned correctly, check the black dots on the side of the traverse

Are all transmitters pointing correctly to their receiver? Check if the red light is shining on the receiver. If necessary, adjust by bending the transmitter/receiver holder

During start up: X1/X2/Y servo error

This is probably caused by a defect in an amplifier board. Please contact Esko for technical support

During start up: X1/X2/Y fuse error

Check the fuse of the motor

If problem persists, it is likely to be the amplifier board malfunctioning. Please contact Esko for technical support

"Missing compressed air"

Check if you still have 7 bar at the MPU

Are the hoses not bending? Can the compressed air flow easily?

Do you hear air escaping? Check for leaks

Is the connection at the head leaking air or broken?

19.2 Tools

After cutting, the design is difficult to remove from waste

Check tool height

After cutting, the corners are still fixed to the waste

Check tool lag

Bad quality in cutting, paper/cardboard tears

Check rotation of the tool

Offset in cut/crease lines

Check tool center offset

Offset between cut lines and crease lines

Check tool offset

Machine is milling in the carpet and table top

The milling bit is lowering inside the collet. Please fix the collet with the appropriate tool.

Milling: “Inverter not started yet”

After touching the safety unit, you need to wait for 10 seconds after resetting safety for the milling inverter to activate

If problem persists, check the connection at the tool head of the milling spindle. Is the big green cable still well connected?

Check all connections of the milling spindle: at tool head, inside cover X1 and at the inverter

Check serial connection between inverter and PC: connection OK? COM port changed lately?

If problem still persists, contact Esko

2 or 3 tools are working at the same time

Check your compressed air, make sure you have 7 bar

Check compressed air connection at the head. Is it well connected or is it leaking air?

Machine is milling in the milling underlay

Check vacuum zones. Are all necessary zones open? You can close non-covered areas to strengthen the vacuum.

Check the force of the vacuum cleaner. It happens the vacuum cleaner is heightening the milling carpets. Try to adjust the force by using the regulator on the spindle / vacuum cleaner.

19.3 iPC

iPC doesn’t want to make connection with the machine

Make sure you first switch on the machine and then iPC, not the other way around

If there was a software update recently, check if the firmware on the machine and iPC are of the same version

Check the serial connection between PC and MCU

Check the connection at the emergency button