

Kongsberg XP

User Manual

09 - 2017 | XP

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1. Preface

User Manual
for
Kongsberg XP
running **i-cut Production Console 2.1**

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
03-02-2017	jhbe	TakeUp Unit, information added
18-04-2017	jhbe	Measuring station operation, information added.
20-04-2017	jhbe	Braille tool description added
20-04-2017	jhbe	Bevel 45 tool adapter description added
03-07-2017	jhbe	Tool Insert Position, limitation information added.
07-08-2017	jhbe	The importance of Braille tool height adjustment has been emphasized.
30-08-2017	jhbe	Braille tool info added

3. Welcome



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

This manual will provide a complete and detailed description of all **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 **User Manual for i-cut Production Console.**

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

Another source for information is the manual: **Get the best out of iPC 2.0.**

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 Creasing or Milling** - how to.
- **Jobs** including **Reverse Operations** - how to.
- **Work with different Reference Point Settings** - how to.
- **MultiZone Production** - how to.

Work with Registration Marks

- A step by step workflow.

System Setup

- Settings specifying the general behaviour of the system.

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.

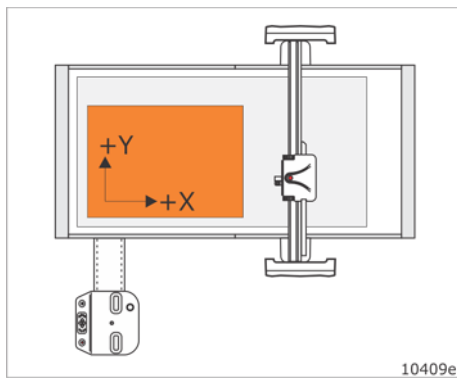
4.2 Name Styles and Symbols

Name or style	Description
Pop-up dialog	This is the dialog that appears when you click the Right mouse button.
<i>Start button</i>	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.
<i>Maintenance</i>	Link to topic.
 Menu Bar->Edit-> Options	Menu selection: From Menu Bar , select Edit and then Options .
	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

In this document, pictures and illustrations related to the **Cutting Table** are viewed as shown 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 XP 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 its **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 **User Manual for i-cut Production Console**.

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 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.



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).



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.



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.

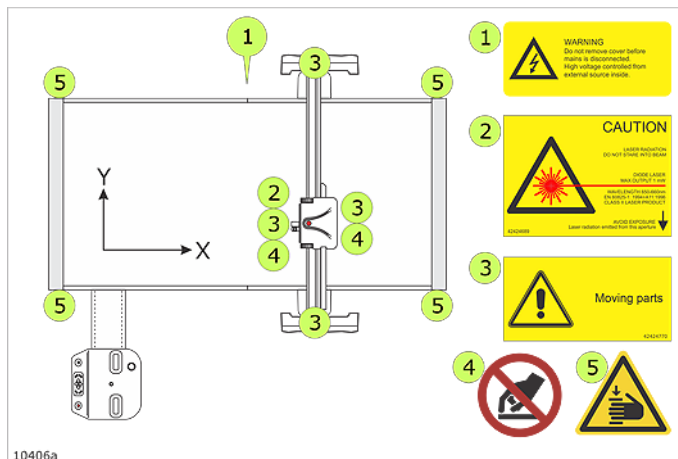
Do not push or pull traverse beam



Use **Manual Jog** functions to move the traverse.

5.6 Attention Areas

5.6.1 Moving Parts, Laser Radiation and High Voltage



5.6.2 Loose Clothing



While working with this machine, do not:

- Use ties
- Use loose necklaces
- Use scarfs

5.6.3 Noise Level



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

5.6.4 Ejection of Parts

Potential risk when running HPMU

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



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

5.6.5 i-Camera strobing light

If your system includes i-Camera, please read this warning carefully:



WARNING

i-Camera is equipped with LED strobing light.

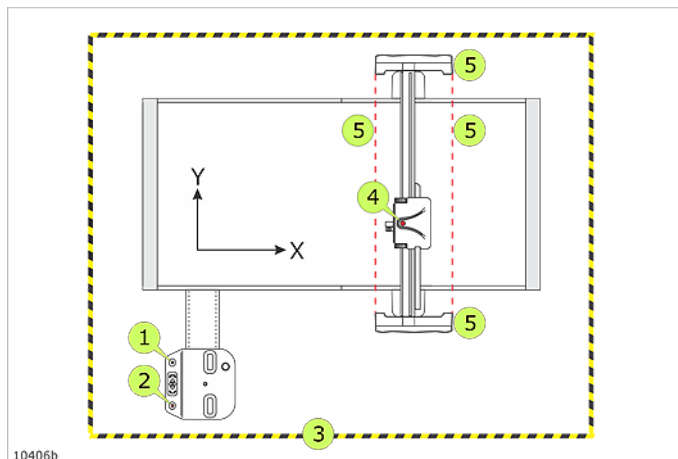
The LED default frequency (10 Hz) is in a range that can cause photosensitive epileptic reactions amongst susceptible people.

If a person is known to be susceptible, the frame rate, frequency of strobing, can be reduced to as low as 1 Hz from the camera configuration menu.

At that rate, seizures are not known to happen.

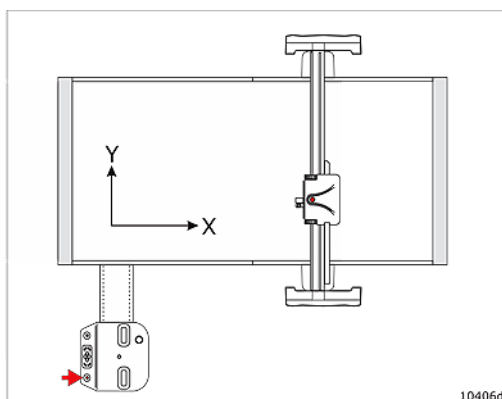
5.7 Safety Devices

5.7.1 Overview



- 1 The **Main Power Switch**
- 2 **Emergency Stop Button**
- 3 **Yellow / Black tape** on the floor to indicate **Attention Area**
- 4 **Warning Lamp**
- 5 **Dynaguard**

5.7.2 Emergency Stop Button



Emergency Stop buttons.

Switch positions

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

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.

Continue after Emergency Stop

To continue operation, proceed as follows:

1. Ensure the table is free from obstructions and ready for operation.
2. Pull out the **Emergency Stop** button.
3. Reset the **Safety System** by pressing the **Pause / Servo On** push button.
4. Observe that **Servo Power** is switched on.
5. Press **Start** to continue.

5.7.3 Yellow / Black tape

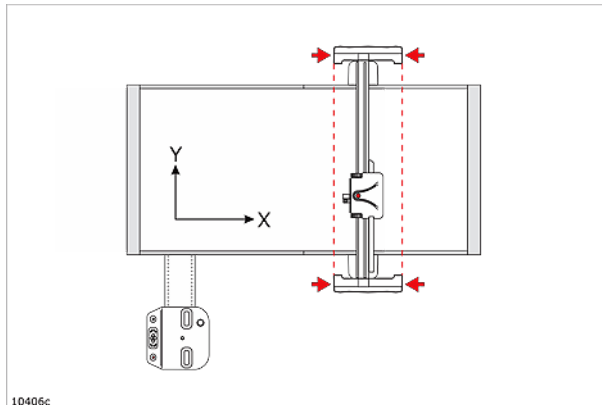
The yellow / black tape indicates the **Attention area**.

This area is restricted to operators and other trained personnel.

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 ready for 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.
- One light beam on traverse front to prevent squeeze risk.
- 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.

Continue Operation

To continue operation after the **DynaGuard Safety System** system has been activated, do:

1. Ensure the table is free from obstructions and ready for operation.
2. Ensure the **Traverse Safety Stop switches** are centered, see illustration below
3. Reset the **Safety System** by pressing the **Pause / Servo On** push button.
4. Observe that **Servo Power** is switched on.
5. Press **Start** to continue.

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

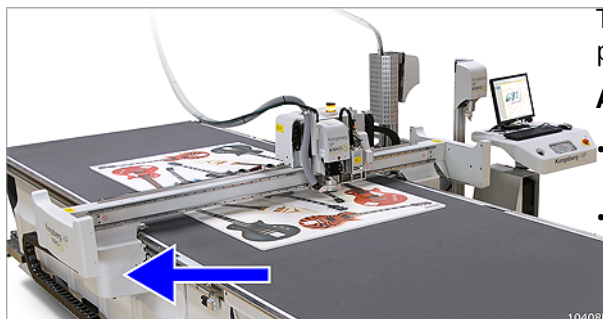
Trouble-shooting and repair shall be executed by **Authorized Personnel** only.

Contact the **Esko Service Organization**.

5.10 Residual Risk

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

Beneath traverse end

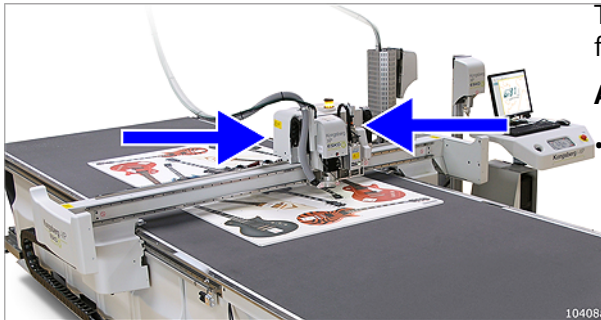


The low part of the traverse end is unprotected.

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

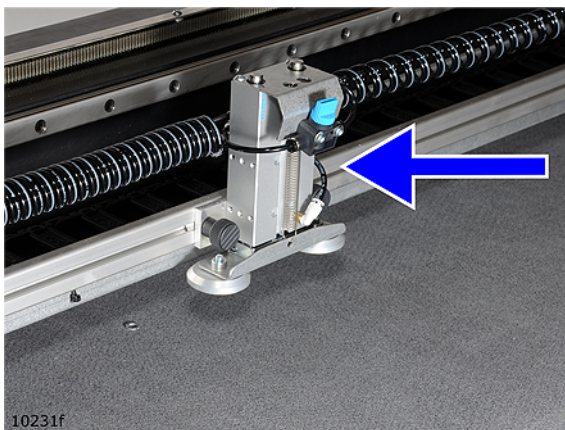


The top of the Y-carriage is un-protected in all four directions.

Actions:

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

Rear side of traverse



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

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

Actions:

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

Inside cable chain



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

Actions:

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

6. System Description

6.1 Naming Conventions

Machine



- 1 Cutting Table
- 2 Tools
- 3 Y carriage
- 4 Traverse

- 5 Main Power on/off switch
- 6 Operator Panel
- 7 Emergency Stop button
- 8 Main Power Unit (MPU)

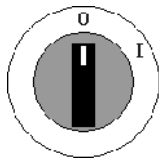
Axes



- X - X-axis
- Y - Y-axis
- X1 - X1 end of traverse
- X2 - X2 end of traverse

- P1 - P1 Tool Position.
- P2 - P2 Tool Position.

6.2 Main Power Switch

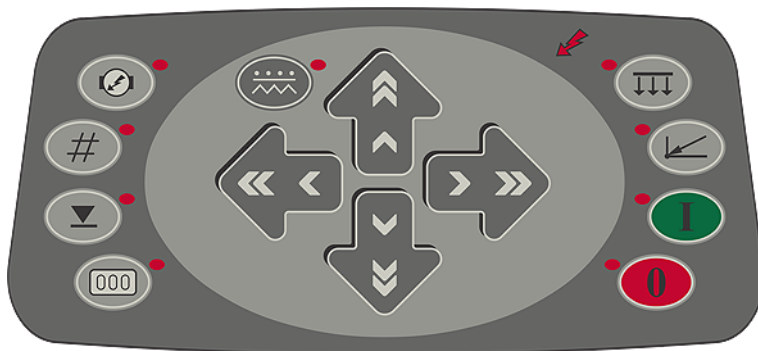


The **Main Power Switch** is located on the **Operator Station**:

Switch positions

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

6.3 Operators Panel



Power On



Mains Power on/off indication.

Servo Power On



Servo Power on/off control.

Start



Press this button to **Start Operation**.

Pause / Safety System Reset



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

Vacuum On/Off



Press this button to switch **Vacuum On/Off**.

Provides material hold down.

Set Panel Reference Point



Press this button to set **Panel Reference Point**.

If **Fixed Reference Point** is disabled, the current position of **Laser Pointer** is set as the new **Reference Point**.

Move to Table Zero



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 **Table Zero** movement is completed.

Jog buttons



Press the **Jog buttons** to move the tool head in the desired direction.

The system must be in **Pause** mode, i.e. the **Pause** 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



Press this button to select **Incremental jog** mode.

Press the button a second time to disable **Incremental jog** mode.



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



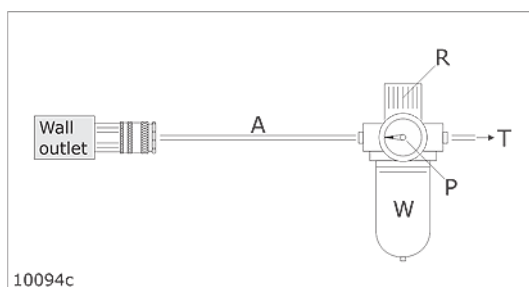
For details about this function, see separate chapter 'Vacuum control'.

If activated for more than 2 seconds, this button activates the **Manual Belt Clamp** function.

6.4 High Pressure 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

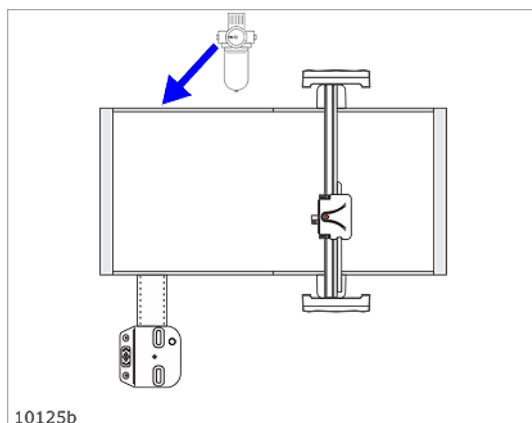
P - Pressure Gauge

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).

Consequences of too low air pressure level:

- Execution will stop.
- An error message is displayed.

6.5 Application Programs Available

After installation of **iPC**, the following application programs are available

iPC

Control program for the **Cutting Table**.

For more information, see **User Manual for i-cut Production Console**.

SysLoad

Program for download of updates to **CU-modules**

HWT900XP

Hardware test program, see separate **HWT900XP 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

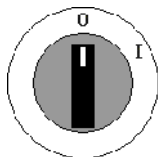


Table Power

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 **Pause** 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 **Pause** to **Reset Safety System**.

7.4 Power Off Sequence

Follow these steps to power down the system:

1

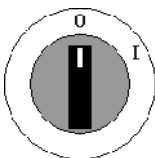
Servo Power



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

The **Starting Point** in this procedure is to **Create a Job** from a file already available in **My Jobs List**.

Detailed information about the complete iPC workflow is available in the following manuals:

- **User Manual for i-cut Production Console.**
- **Get the best out of iPC 2.0.**

Here, a step by step procedure is provided that can be used as a check list.

8.2 Create Job



In **My Jobs List**, double-click a file.

Create Job

My Job Actions->Create Job.

A new **Job** is created based upon currently selected file in **My Jobs List**.

8.3 Layer Setup



Opened Job->Layers.

Ensure proper **Layer Setup**.

8.4 Production Setup



Opened Job->Production Setup.

Verify correct **Production Setup**:

- **Number of Copies**
- **Accuracy/Speed Prioritization**
- Select **Reference Point** and **Job Position**
- **Step and Repeat**
- **Registration**
- **Material Handling**
- **Tool Head Parking**

8.5 Speed Setting



Opened Job->Production Setup->Quality.

Specify if this is a **High Accuracy** or a **High Speed Job**.

8.6 Flute/Grain Direction



Properties Bar->Flute/Grain Direction.

Verify that the **Flute/Grain Direction** corresponds to the material.

8.7 Vacuum Zone Selection



Machine Panel Toolbar->Vacuum Zones

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

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

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

8.8 Job Execution

Before execution, check this:

- 1 Verify that **Opened Job** is ready for production.



- 2 Verify that the **Table View** display of the **Job** is reasonable.

- 3 Press **Pause** to reset **Safety System**.



- 4 Complete a **Table Top Reference** sequence to update **Tool Height** measurement.

- 5 Position the material on the **Cutting Table**.

- 6 Press **Vacuum On** to start the **Vacuum Pump**.



(If you are running with **Automatic Vacuum Control** enabled, the pump will start automatically when **Start** is pressed)

- 7 Press **Start** to execute the **Job**.



8.9 Corrugated Production

Corrugated Production without **Registration Marks** is straight forward following the procedure described in the [Prepare for a Job](#) - chapter.

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

8.10 Milling Production

Milling Production without **Registration Marks** is straight forward following the procedure described in the *Prepare for a Job* - chapter.

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

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

8.11 Make a Pen Plot

Pen Plot without **Registration Marks** is straight forward following the procedure described in the *Prepare for a Job* - chapter.

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

9. How To Procedures, Advanced

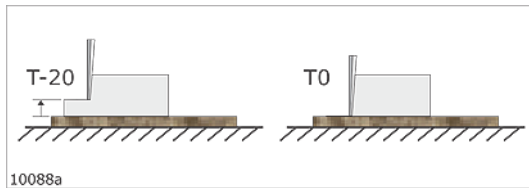
9.1 Cutting Thick Materials

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.

Follow the procedure described in the [Prepare for a Job](#) - chapter.

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

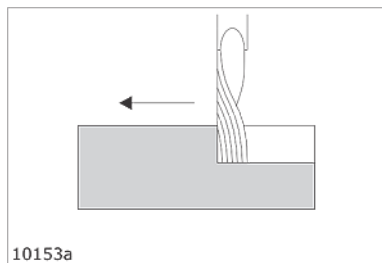


To prepare hard board materials, the procedure is as follows:

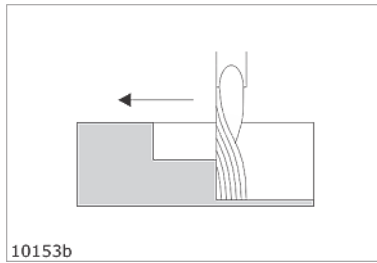
1. **Mill** through the top layer using **HPMU**.
2. **Cut** through the mid-section using the **MP HF VibraCut Knife**.
3. **Mill** through the bottom layer using **HPMU**.

- Ensure that the router bit is sharp and proper for the job.
- Ensure that the **Knife Blade** is sharp and proper for the job.

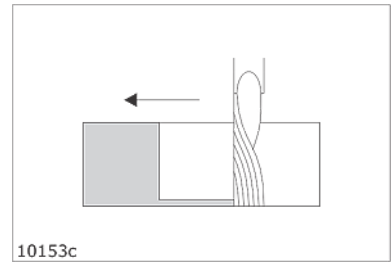
9.3 Multi Pass Creasing or Milling



1. pass



2. pass



3. pass - mill through and clean the path

Multi Pass Creasing is beneficial if you want a deeper crease path.

This is achieved by running one pass with for example 50% depth and a second pass with 70% depth.

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

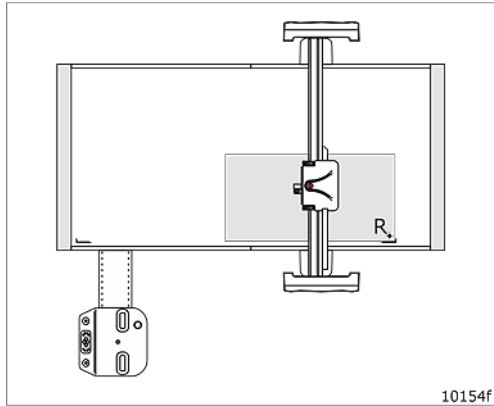
Multi pass creasing or milling is available by modifications in the **Opened Job->Layer** structure.

Proceed as follows:

1. Identify the **Layer** containing the crease or milling line(s) where **Multi Pass** is wanted.
2. Make one or more copies of the **Layer** including geometry.
3. The **Layers** will be executed in the listed sequence.
4. In the **Layers**, update the depth values to suitable steps.

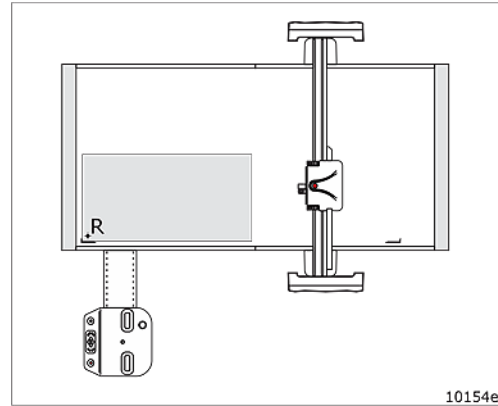
For execution, follow the procedure described in the [Prepare for a Job](#) - chapter.

9.4 Jobs including Reverse Operations



Step 1 - the sheet is aligned towards the **Right Ruler**.

Reverse Operations are completed.



Step 2 - the sheet is aligned towards the **Left Ruler**.

The rest of the job is completed.

A typical use of **Reverse Operation** is when you want to add a **crease** line on the front side of a material that you normally prepare from the rear side.

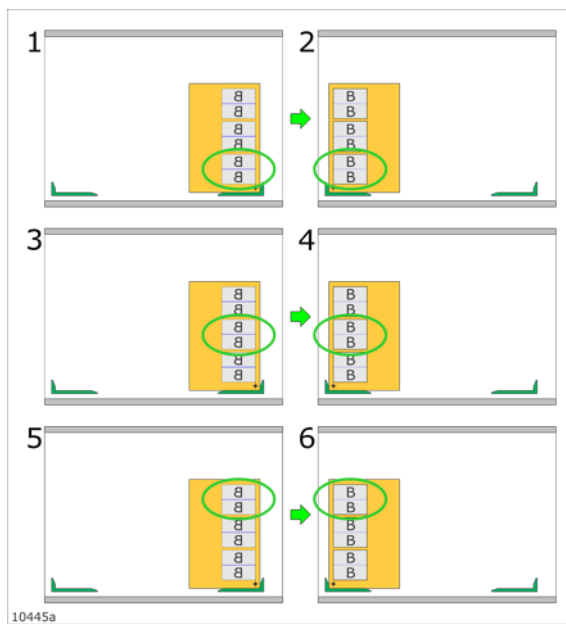
Reverse Operation is available by modifications of the actual **Layer**.

This function requires that the table is equipped with **Left and Right Rulers**.

Note: **Reverse Operation** is not available on machines with conveyor belt.

Reverse Operation in combination with Step and Repeat

For each copy defined by **Step and Repeat**, you have to move the sheet; first against the **Right Ruler**, then against the **Left Ruler**:



9.5 Work with different Reference Point Settings

Select the **Reference Point** to use from:



Opened Job->Production Setup->Position->Reference Point

For more information, go [here](#).

9.6 MultiZone Production

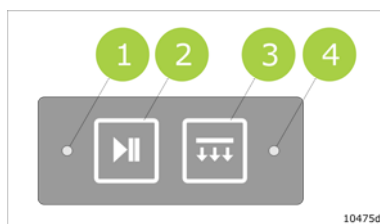
Introduction

In **User Manual for i-cut Production Console**, general information about **MultiZone Production** is available.

In this chapter, XP - specific issues are described.

MZP Panel

Each work zone is equipped with a panel that makes it possible to run the complete **MultiZone Production sequence** from the table.



- 1 - Ready Lamp
- 2 - Ready Button
- 3 - Vacuum on Button
- 4 - Vacuum Lamp

Vacuum Zones

[Vacuum Zone Configuration](#) on page 50

MultiZones

Machine Models	MultiZones	
XP20 		
XP24 		
XP44 		

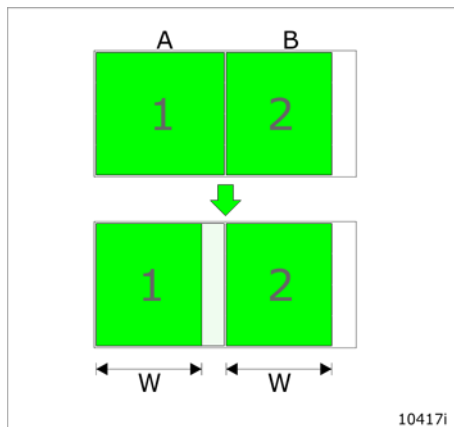
The illustration shows the most actual zones available for **MultiZone Production**.

Limitations

Work Areas on a MultiZone table

If you have a standard **Cutting Table**, prepared for **MultiZone Production**, this limitation is valid.

If your table is modified for two equal zones, where $W = 1600 \text{ mm} / 63 \text{ in}$, please disregard this limitation chapter.



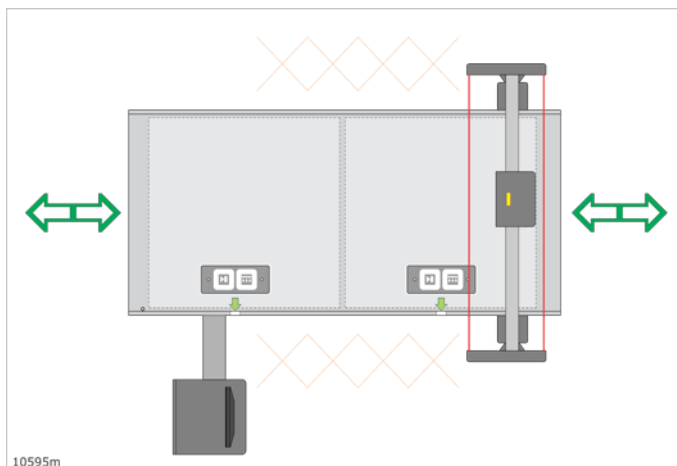
The last section of a multizone table is somewhat smaller than the first one(s).

As a consequence, the work area available for **MultiZone Production** is determined by the size of the last section.

$W(XP24) =$

$W(XP44) =$

9.6.1 MultiZone, Workflow



- Recommended material flow direction.



- Attention Area.

During operation in one zone, parts of the traverse will move into the other zone (photo cell beams, traverse end cover).

To ensure a continuous workflow, the operator should be very careful inside the **Attention Area**, not to trigger the safety system by his body or by material in and out.

Thus, we recommend loading and unloading material from the front- and back end of the table.

10. System Setup

10.1 Introduction

This chapter will explain functions and parameters that are important for the **XP system** to run properly.

It is a supplement to the information available from the **User Manual for i-cut Production Console**.

Examine each step carefully to ensure proper settings:

One time adjustments completed at the factory

The functions are included here as a reference.

They are not used during normal operation.

If necessary, they should be repeated, as indicated in the function description.

- 1 *Adjust X1 to X2 Angle*
- 2 *Register Table Size*
- 3 *Adjust Measuring Station Position*
- 4 *Set Ruler Position*
- 5 *Set Main Reference Point*
- 6 *Map Table Top Surface*
- 7 *Calibrate Foot on Measuring Station*
- 8 *Vacuum Setup*
- 9 *Router Setup*

Adjustments to customize the table

- 1 *Select Reference Point*
- 2 *Set Table Speed*
- 3 *Set Table Acceleration*

- 4 *Jog Settings*
- 5 *Set Table Top Reference*
- 6 *Conveyor Belt Control*
- 7 *Board Size*

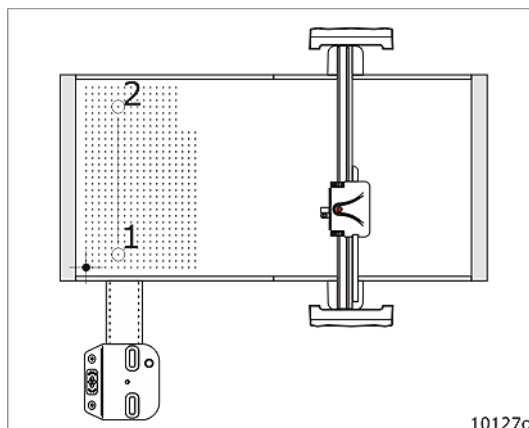
10.2 Adjust X1 to X2 Angle



Machine Connection->Machine Configuration->Installation_>Adjust X1 to X2 Angle

Use this wizard to obtain correct angle between X axis and Y axis.

Typical use is after maintenance or repair.



Procedure:

1. Execute the **Adjust X1 to X2 Angle** function.
2. Follow the instructions exactly as given by the wizard.

Note: Select a set of drilled vacuum holes (1 and 2) in the **table top** as reference.

10.3 Register Table Size



Machine Connection->Machine Configuration->Installation_>Register Table Size

This wizard moves the **Tool Head** from edge to edge of the **Cutting Table** in order to measure the table size.

Typical use is after maintenance or repair.

Procedure:

1. Execute the **Register Table Size** function.
2. Follow the instruction given by the wizard.

10.4 Adjust Measuring Station Position



Machine Connection->Machine Configuration->Installation->Adjust Measuring Station Position

Use this wizard to calibrate the position of the **Measuring Station** to the system.

Typical use is after maintenance or repair.

Procedure:

1. Press the **Adjust Measuring Station Position** button.
2. Follow the instruction given by the wizard.
3. Repeat this procedure after maintenance on the **Measuring Station**.

10.5 Set Ruler Position



Machine Connection->Machine Configuration->Installation->Set Ruler Position

Follow instructions from the wizard.

If your table is equipped with **Rulers**, please complete the wizard for **Left and Right Ruler**.

For the table to operate properly an exact registration of the **Ruler Positions** is necessary.

This is a one time job, but it can be necessary to repeat the procedure if mechanical maintenance has been carried out on the table or traverse.

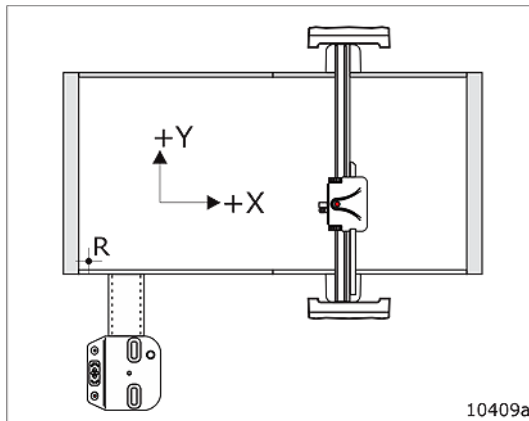
Correct registration of the **Right Ruler** is required when **Reverse Operations** are carried out.

10.6 Set Main Reference Point



Machine Connection->Machine Configuration->Installation->Set Main Reference Position

Follow instructions from the wizard.



Use this wizard to establish the **Main Reference Point (R)**.

Typical use is after maintenance or repair, if the **Main Reference Point** has been accidentally moved.

The **Main Reference Point** is a fixed position on the **Cutting Table** marked as a cross of drilled holes.

For more information, go [here](#).

10.7 Map Table Top Surface



Machine Connection->Machine Configuration->Installation_>Map Table Top Surface

To assure correct **Cutting Depth**, the surface of the **Table Top** is measured in order to create a map.

It is recommended to execute this function if the **Cutting Mat** is worn out and after the **Cutting Mat** has been replaced.

Procedure:

1. If the table is equipped with a **Conveyor Belt**, move the belt junction away from the table surface.
2. Execute the **Map Table Top** function.
3. Follow the instructions given by the wizard.

Note:

iPC 2.1: The mechanism of compensating Z height during cutting, based on table top mapping, has been disabled when cutting underlay has been measured to be more than 5mm.

This level is normally reached when milling on top of milling mat and conveyor belt.

This exception was introduced long time ago, before using conveyor belts.

At that time, a (MDF) plate was used as milling underlay. The plate was milled in order to make a perfectly compensated underlay for milling.

As this function is not used anymore, and conveyor belts break the 5 mm limit, iPC now always compensate based on table top mapping.

A registry setting is available to enable the old behavior.

10.8 Calibrate Foot on Measuring Station



Machine Connection->Machine Configuration->Installation->Calibrate Measuring Pad

Use this wizard to calibrate the height level of the **Measuring Station**.

Typical use is after maintenance or repair; to ensure the tool height measuring system works properly.

Procedure:

1. Press the **Calibrate Foot**.
2. Follow the instruction given by the wizard.
3. Repeat this procedure after maintenance on the **Traverse**, **Carriage** or **Measuring Station**.

10.9 Reference Points and Coordinate System

Reference Points settings is maintained from:



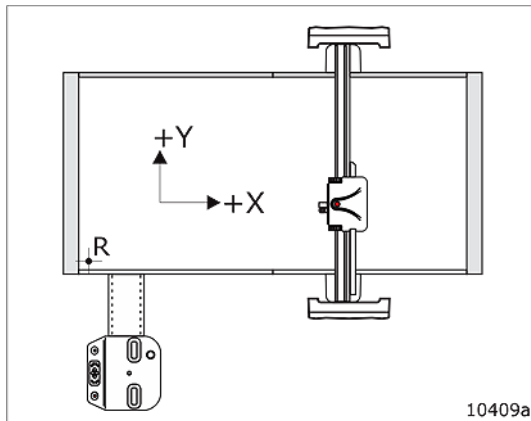
Menu Bar->Edit->Options...->Reference Points

All X and Y coordinates in the **Input File** have the selected **Reference Point** as origin.

Two modes of operation are available:

- Using **Main Reference Point**
- Using **User Defined Reference Point**

The Main Reference Point position



The **Main Reference Point** is a fixed position on the **Cutting Table** marked as a cross of drilled holes.

The **User Defined Reference Points** are all specified relative to the **Main Reference Point**.

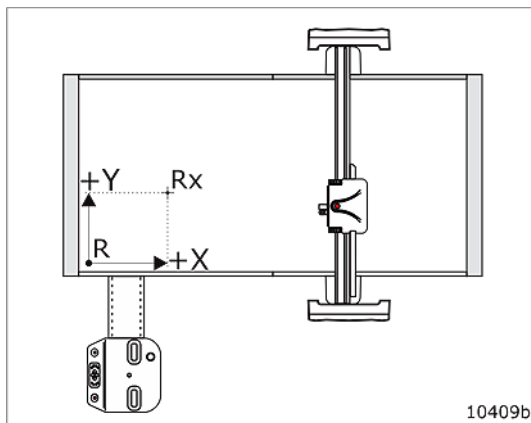
Thus, moving the **Main Reference Point** will move these reference points as well.

The **Main Reference Point** has to be correctly positioned in order to obtain:

- A full Work Area.
- Correct Sheet Feed operation.
- Correct handling of Long Jobs

Using the **Main Reference Point** during program execution ensures correct operation.

User Defined Reference Points



You can specify **User Defined Reference Points**.

User Defined Reference Points are used if you want your job positioned in a fixed position on the table (Rx), but not in the **Main Reference Point** (R).

A special version of **User Defined Reference Point** is the **Panel Reference Point**.

- 1 Position the **Laser Pointer** in the position where you want your **Panel Reference Point**.

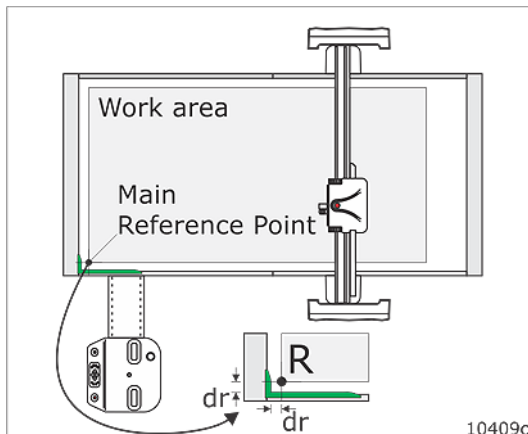
2

Press the **Set Panel Reference Point** button on **Operators Panel**.

The **Panel Reference Point** is set to current **Laser Pointer Position**

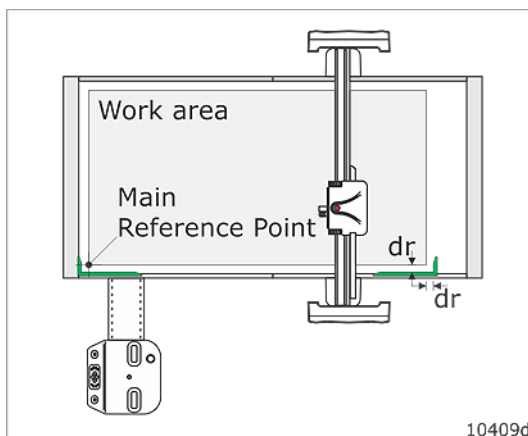


Rulers and Reference Points



The **Ruler System** ensures an easy and correct positioning of the material on the table.

The **Main Reference Point** shall be defined $dr = 10 \text{ mm}/0.39 \text{ in.}$ inside the ruler.



When you use the **Right Ruler**, the **Reference Point** will automatically be moved to an identical distance from the **Right Ruler**, as it is defined from the **Left Ruler**.

The **Right Ruler** is normally used for **Reverse Score** operations. At the same time the direction of the X axis is reversed.

10.10 Table Speed

➡	Menu Bar->Advanced->Configure Tools...->Velocity X/Y This is the default value for each Tool when Layers are created.
➡	Opened Job->Edit Layer->Speed X/Y Modify Speed for this particular Job.
➡	Opened Job->Production Setup->Quality Here you specify if this is a High Quality Job or High Speed Job .

10.11 Table Acceleration



Menu Bar->Advanced->Configure Tools...->Acceleration

This is the default value for each tool when **Layers** are created.

Note: Acceleration can be reduced to a % value of the maximum acceleration available.



Opened Job->Layers->Edit Layer->Acceleration

Modify acceleration for this particular Job.

10.12 Jog Settings

Continuous Jog speed

The **Continuous Jog Speed** can be reduced to a % value of the maximum jog speed:



Machine Connection->Machine Configuration->Setup_>Jog Speed

Specify low and high **Jog Speed**

Incremental Jog Step Size

The size of the **Incremental Jog** movements can be customized.



Machine Connection->Machine Configuration->Setup_>Incremental Jog

Specify **Step Size** to be used.

Jog Directions



Machine Connection->Machine Configuration->Setup_>Jog Panel Direction

Use this function to align the **Jog Directions** with the orientation of the **Operator Station**.

10.13 Set Table Top Reference



Menu Bar->Machine->Set Table Top Reference

Follow instructions from the wizard.



Machine Connection->Machine Configuration->Installation_>Table Top Reference

Follow instructions from the wizard.



Machine Panel Toolbar->Table Top Reference

Use this function to complete a **Tool Height Reference** calibration.

The **Tool Height** is measured in current position and the reference to the table top surface is updated.

This calibration is the basis for **Tool Height** calculation.

The **Table Top Reference** function should be carried out:

- After mechanical adjustments of traverse or tool head.
- When cutting through material is not working properly.
- After any change of cutting / milling underlay, for instance, after adding or removing the milling underlay.

Procedure:

1. Remove all materials from the table surface.
2. Measure on top of the cutting underlay or conveyor belt.
3. If the table is equipped with a conveyor belt, avoid measuring directly on the belt junction.
4. Execute the **Table Top Reference** function.
5. In the wizard, press OK to start measurement.

10.14 Vacuum Setup

10.14.1 Vacuum Zone Configuration



Machine Connection->Machine Configuration->HW Configuration->Vacuum Setup



This is a dialog where the **Vacuum Zone Configuration** for the actual machine is specified.

This setup is a one-time job as long as the **Vacuum Zone Solution** on the machine remains unchanged.

The setup should correspond to the actual hardware.

The selected setup will determine which **Vacuum Zone Configuration** that will be available in the **User Interface**.

Machine	Zone Configuration	Vacuum Configuration
XP20	<div> <div>A</div> <div> <div>4</div> <div>3</div> <div>2</div> <div>1</div> </div> </div>	#7
XP24	<div> <div>A</div> <div>B</div> <div> <div>4</div> <div>3</div> <div>2</div> <div>1</div> </div> <div> <div>4</div> <div>3</div> <div>2</div> <div>1</div> </div> </div>	#2
XP44	<div> <div>A</div> <div>B</div> <div> <div>4</div> <div>3</div> <div>2</div> <div>1</div> </div> <div> <div>4</div> <div>3</div> <div>2</div> <div>1</div> </div> </div>	#2

10.15 Router Setup



Machine Connection->Machine Configuration->HW Configuration->Router Setup

From the **Router Setup** dialog, maintain the following parameters:

Specify Router

If a **Router** is mounted, specify **Router Type**.

If no **Router** is mounted, select **None**

COM-port

The physical COM-port used for communication with the **Router Control Unit** is specified.

Note: The **Router Control Unit** needs to be connected to a genuine COM port. If connected to a USB-to-COM adapter, the communication will fail.

These functions are used only after a hardware modification.

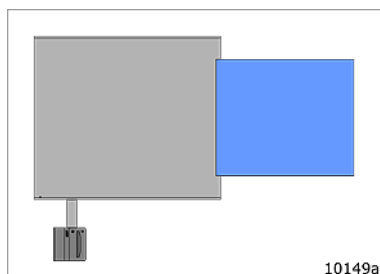
10.16 Conveyor Belt Control



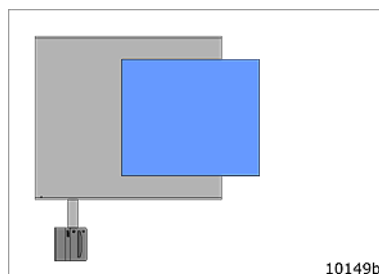
Machine Connection->Machine Configuration->HW Configuration->Conveyor

Specify if the machine is equipped with **Conveyor Belt**.

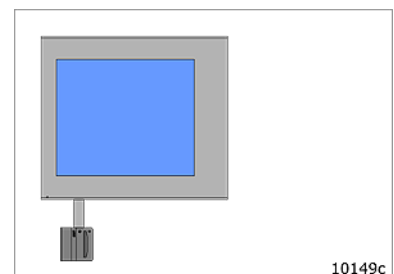
10.16.1 Split Sheet Feed



Sheet in Load Position



Sheet Load, step 1

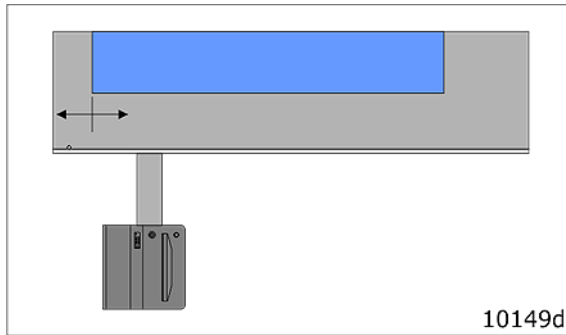


Sheet Load, step 2

In some occasions, the sheet unloaded from the cutting table can trigger the photo cell safety system.

To avoid this, the sheet feed movement is divided into two steps.

10.16.2 Sheet Feed Correction



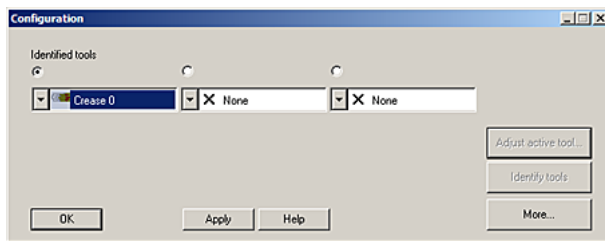
If the **Conveyor Belt** feed length needs adjustment, use this function to adjust the movement of the **Conveyor Belt** to be shorter or longer.

10.17 Board Size

Not implemented yet

11. Tool Configuration and Adjustment

➡ Machine Connection->Tool Configuration

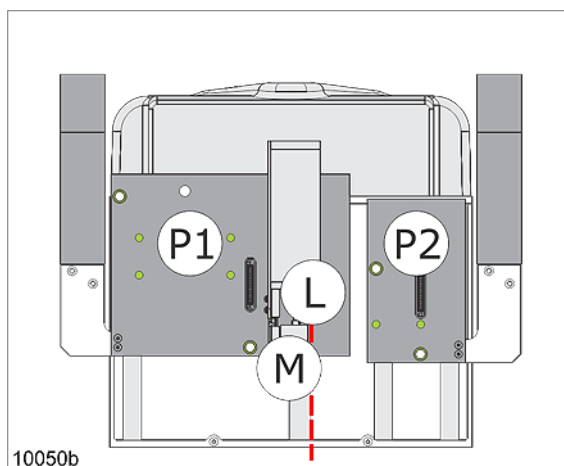


The **Tool Configuration** dialog is used for all tool settings and adjustments.
Select tool and function.

11.1 Tool Configuration

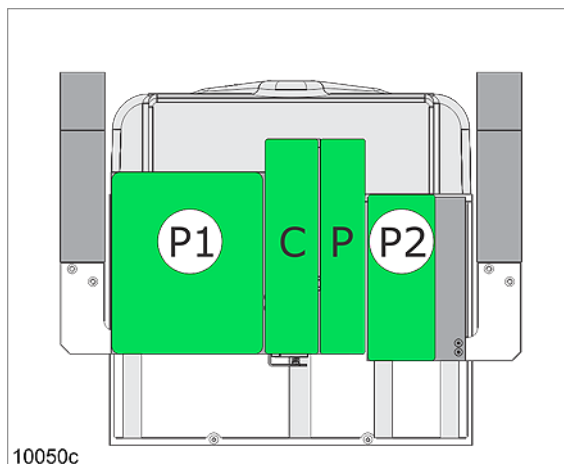
The XP machine offers two different tool positions, P1 and P2, where different interchangeable tools can be mounted.

In addition, there are separate fixtures for **Laser Pointer**, **Measuring Foot**, **Camera**, **Drill** and **Pen Tools**:



L - Laser Pointer

M - Measuring Foot



P1 - P1 tool position, see table below

C – **Camera** position

P - **Pen / Drill / Ink Tool** holder position

P2 - P2 tool position, see table below

The following tool configurations are available:

Tool Type	Available Tool Inserts	P1	P2
HDU - Heavy-Duty Unit	HD Crease, V-notch Knife, HD Knife Tool	Yes	
FCU - Foam Cutting Unit		Yes	
HD Knife Tool		Yes	
HPMU – High Power Milling Unit		Yes	
VibraCut Knife Tool			Yes
HF VibraCut Knife Tool			Yes
HiForce Knife Tool			Yes
RM Knife Tool			Yes
RotaCut Knife Tool			Yes
PressCut			Yes
Drill/Pen Holder	Drill Tool, Ballpoint Pen, Ink Tool (Fibertip Tool)		

11.2 Tool Names

Factory Tool Name

The **Tool Type** mounted is identified by hardware codes inside each tool.

The identified tool is called **Factory Tool Name**

The mounted tools are maintained by:



Machine Connection->Tool Configuration

Current tool configuration is displayed under **Identified tools**.

When a new tool is inserted, it will be identified to the system automatically.

By default the system creates a username from the tool type and its serial number. E. g. a knife with serial number 3020 will be named **Knife 20**

User Tool Name



Menu Bar->Advanced->Configure Tools

From this dialog, you can give each tool a nickname.

11.3 Adjust Active Tool



Machine Connection->Configure Tools->Adjust Selected Tool

Follow instructions from the wizard.

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 **Folding 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.



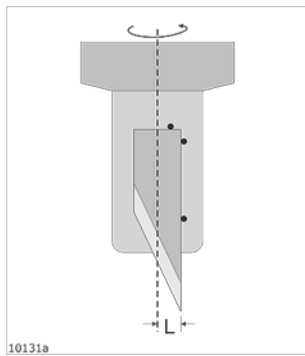
Before any adjustment, complete a **Table Top Reference** function.

11.4 Lag Settings (for Rotating Tools)



Machine Connection->Configure Tools->Adjust Selected Tool->Lag Settings

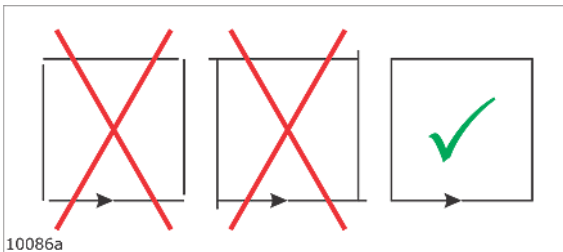
Follow instructions from the wizard.



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 Test

➡ **Machine Connection->Configure Tools->Adjust Selected Tool->Lag Settings->Lag Test**



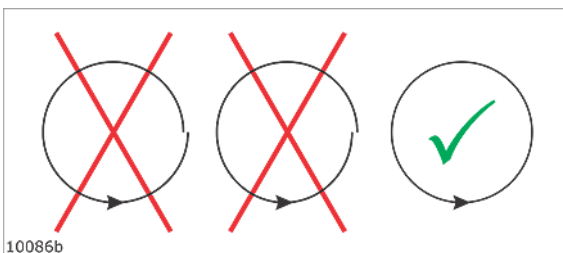
Run this wizard to obtain correct **Knife Lag** value.

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 **Opened Job->Edit Layer** dialog

11.5 Tool Height Calibration



Machine Connection->Configure Tools->Adjust Selected Tool->Tool Height Calibration

Follow instructions from the wizard.

C systems are equipped with **Automatic Tool Height Calibration**.

Thus, the system will run without any manual height calibration.

If you would like to add an offset to the measured height, use the **Tool Height Calibration** dialog:

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.

Typical use of this function is to add depth in order to ensure proper through-cut in difficult materials.

11.6 Rotation Adjustment (for Rotating tools)

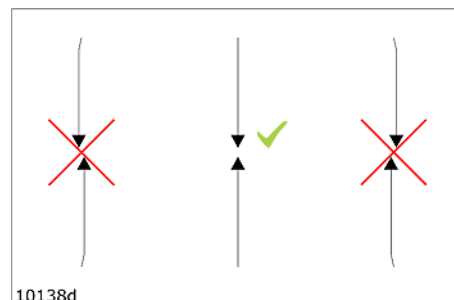
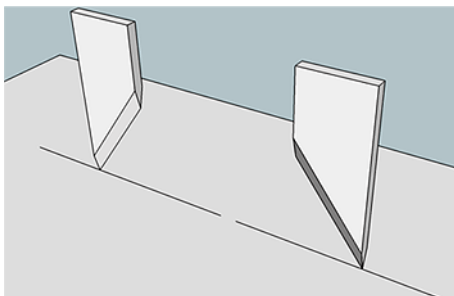
Optimal **Angular Offset** may vary with different material strength and thickness.

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

Adjustment using Wizard



Machine Connection->Configure Tools->Adjust Selected Tool->Rotation Adjustment



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



Machine Connection->Configure Tools->Adjust Selected Tool->Manual Adjustment of...

Follow instructions from the wizard.

1. Place an appropriate test material on the table, and switch **Vacuum On**.
2. From **Machine Connection->Tool Configuration**, 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.

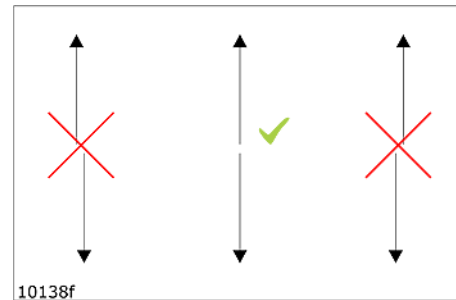
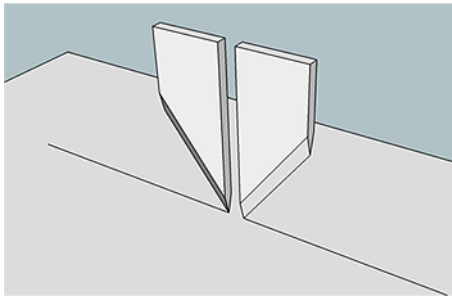
11.7 Center Offset Adjustment

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

Adjustment using Wizards



Machine Connection->Configure Tools->Adjust Selected Tool->Center Offset Adjustment



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

Manual Adjustment



Machine Connection->Configure Tools->Adjust Selected Tool->Manual Adjustment of...

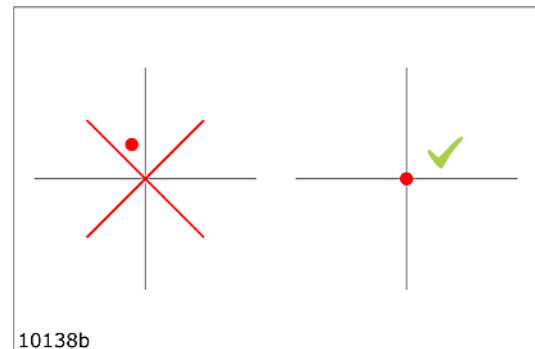
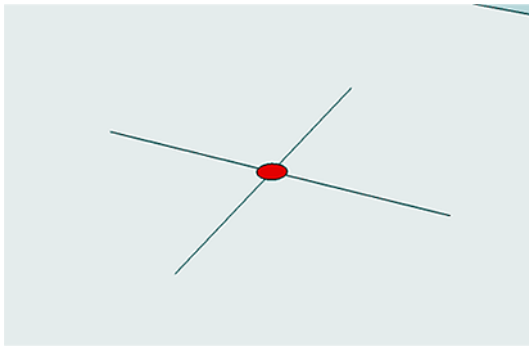
Follow instructions from the wizard.

1. Place an appropriate test material on the table, and switch **Vacuum On**.
2. From **Machine Connection->Tool Configuration**, 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.

11.8 Tool Offset



Machine Connection->Configure Tools->Adjust Selected Tool->Offset Adjustment



The **Laser Pointer** is the reference:

1. Place an appropriate test material on the table, and switch **Vacuum On**.
2. From **Machine Connection->Tool Configuration**, select one **Tool**.
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.

11.9 Maintain Tool List



Machine Connection->Configure Tools->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**.

12. Tooling System

12.1 Introduction



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.

In this chapter, all tools are explored:

- General description
- How to operate
- How to adjust

12.2 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.

12.3 How to Replace a Tool



When mounting a tool onto the P1 or P2 **Tool Positions**, ensure that the **Guide Pins** and the electrical connector fits those on the bracket.

Use an **Allen Key**, 6 mm, to fix the tool.

Ensure both screws are properly fixed.

12.4 Two or more tools of the same type

Each tool is identified to the system by **Tool Type**.

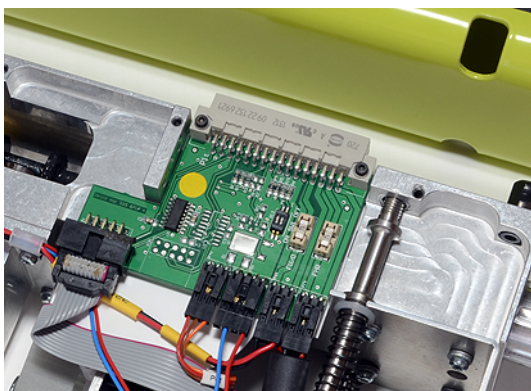
In addition, it is possible to identify up to four different tools of the same type.

One example:

If you have two different **Static Knife Tools**, you can specify one to be number 1 and one to be number 2.

In this way, all **Adjustment Parameters** will be stored and recalled automatically as the tool is mounted onto the machine.

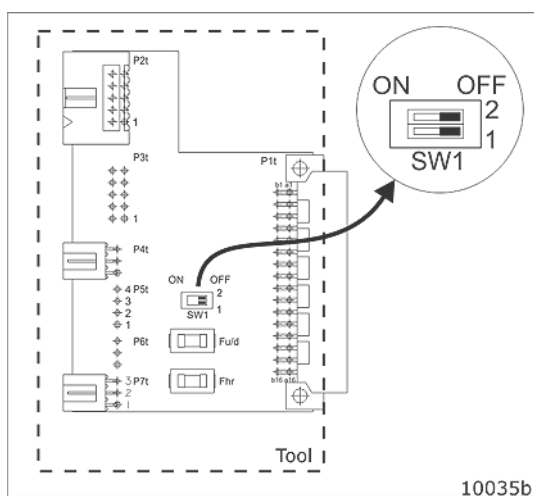
How to define individual Tool Numbers



Inside each **Tool**, there is a **Tool Board**.

By means of dip-switches, you can specify 4 unique **Tool Numbers**.

The different **Tool Numbers** are defined as follows:

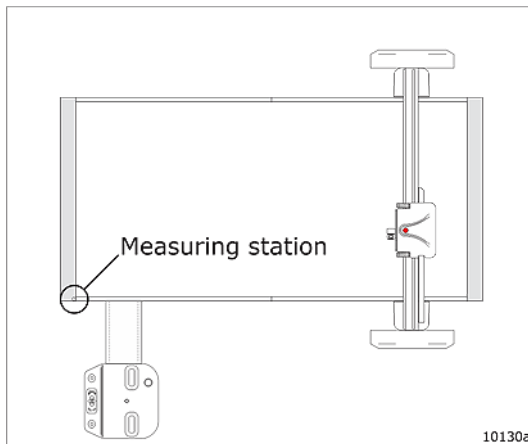


Tool Number	Tool Board switch setting
Tool 1	1 & 2 off
Tool 2	1 on & 2 off
Tool 3	1 off & 2 on
Tool 4	1 & 2 on

Note: There are some restrictions, see **Technical Manual** for more information.

12.5 Measuring Station

XP is equipped with a **Measuring Station**:



The **Measuring Station** eliminates the manual adjustment of tool height.

The **Measuring Station** covers the following functions:

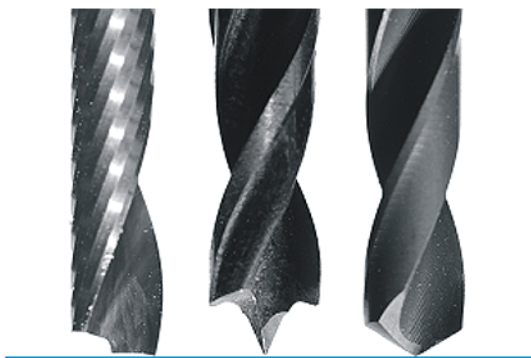
- Calibrates the **Measuring Foot**.
- Automatically measures the height of the tool tip.

If you, for any reason, would like to add an adjustment value to the measured value, a height adjustment dialog is available from the **Tool Configuration** menu.

The **Measuring Sequence** is carried out as follows:

- During the first **Table Zero Sequence** after **Power On**.
- After any **Tool** change and the **Tool** is not calibrated.
- After the **Safety System** has been broken for 30 sec. or more.
- After the **Servo System** has been off for 30 sec. or more.
- During the **Table Zero Sequence** if **Incremental Jog** is selected.

Tool Depth and Measuring Station



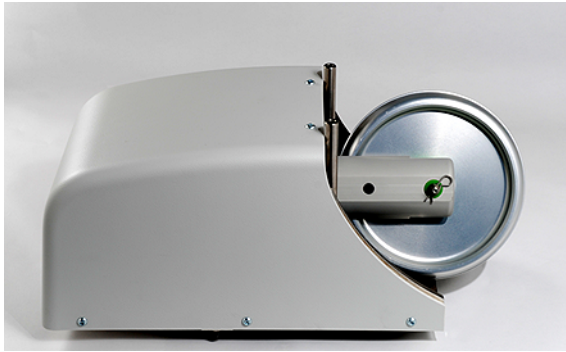
Be aware how the **Measuring Station** is working; it is the tool tip that is measured.

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

Additional depth is entered in two ways:

- The general depth of a **Tool** is entered from **Machine Connection->Configure Tools->Adjust Selected Tool->Tool Height Calibration**.
- The **Job** specific depth is entered from **Opened Job->Edit Layer**

12.6 HDU - Heavy-Duty Unit



HDU with ø150 mm Crease Wheel

The **Heavy-Duty Unit** is a single position **Tool Head** specially prepared for **V-notch** and **HD Knife tools**.

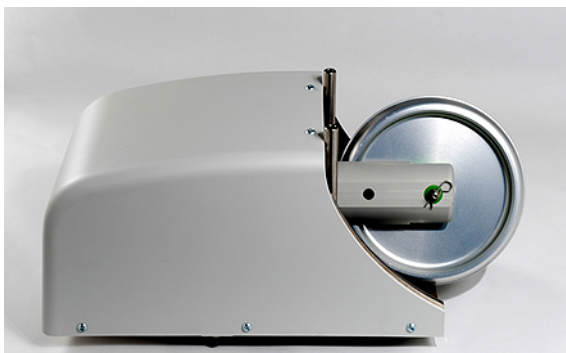
In addition, the **Tool Head** can be equipped with a **ø150 mm Crease Wheel**, crease adapter and perforation wheel.

For detailed description, see separate chapters for

- [*V-notch Knife*](#)
- [*HD knife tools*](#)
- [*ø150 mm Crease Wheels*](#)
- [*Crease Adapter*](#)
- [*Perforation Wheel ø60 mm*](#)

12.6.1 Crease Wheel ø150 mm

Description



A **ø150 mm Crease Wheel** mounted on an **Heavy-Duty Unit**.

This **Crease Wheel** has the equivalent of 50 kg [110 lbs] 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 **Crease Wheels** with different shapes is available.

How to mount / dismount Crease Wheels



Insert / remove the **Latch Pin**.



Insert / remove the **Cotter Pin**.

Tool Adjustment

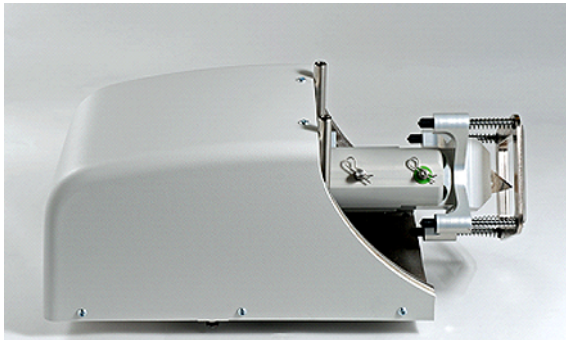
For this tool, complete the following adjustments:

Adjustment	Description
Lag Setting	The Lag value depends upon the Blade Adapter . Nominal value is 0 mm.
Tool Height	Measured automatically, possible to add an Offset Value .
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

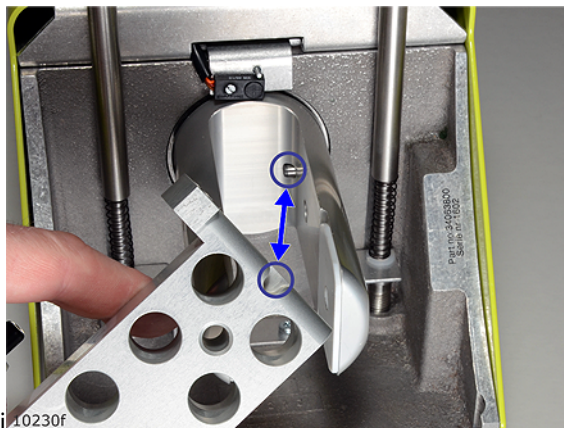
12.6.2 V-notch Knife Tool

Description



The **V-notch Knife Tool** mounted on a **Heavy-Duty Unit**.

How to insert / remove the V-notch Knife Tool



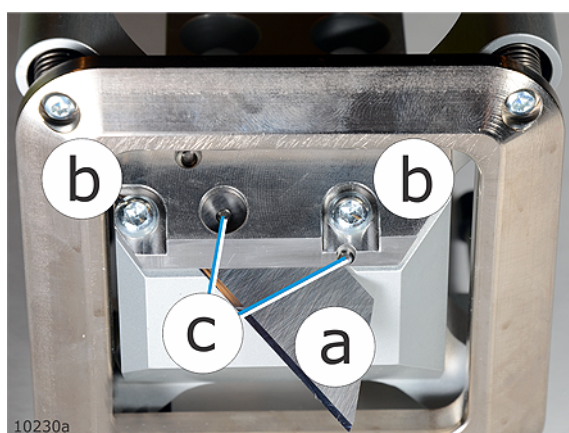
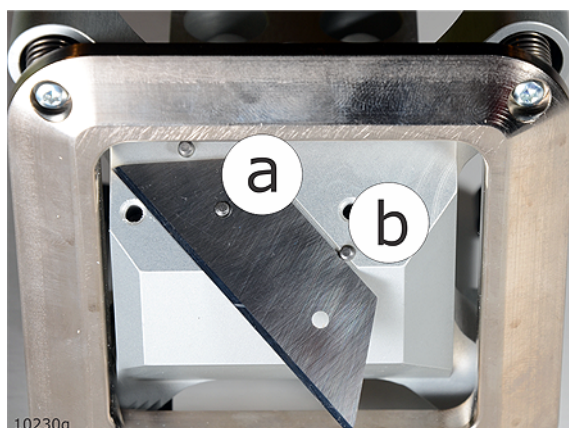
1 Turn the **V-notch Knife Tool** correctly to fit the **Guide Pin**.



2 Insert the two **Latch Pins**.

3 Insert the **Cotter Pins**.

How to replace a Knife Blade



This picture shows how the **Knife Blade** is aligned using two **Guide Pins** (a and b) beneath the blade clamping.

1. Loosen the two screws (b) of the **Knife Blade** clamping.
2. Carefully remove the blade (a).
3. Insert a new **Knife Blade** and make sure that it is aligned with the **Guide Pins** (c).
4. Mount the new tool. (Note the position of the **Guide Pin**).
5. Ensure that the tool height is calibrated on the **Measuring Station**.

About Tool Adjustment

- For the **V-notch Knife**, we recommend the manual procedures for **Tool Rotation** and **Center Offset** adjustment.
- When adjusting **Tool Rotation** and **Center Offset**, use a thin **Folding 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.

For this **Tool**, complete the following adjustments:

Adjustment	Description
Lag Setting	The Knife Lag depends upon the Blade Adapter . Nominal value is 0-7 mm.
Tool Height	Measured automatically, possible to add an Offset Value
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

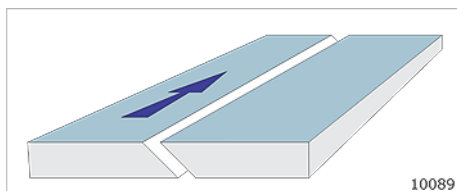
How to set the depth of the V-notch Knife

1. The default depth of the **V-notch Knife** is cut through the entire material.
2. To make adjustment to the depth, go to **Opened Job->Edit Layer**.
3. Normally the cut should extend down to just above the **Bottom Liner**.

How to run the Triple Cut Function

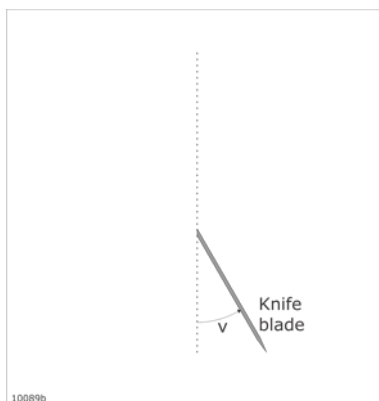
To set the **Triple Cut Function**, go to **Opened Job->Layer Setup**.

V-notch Knife 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**.

Different angles



A wide range of V-notch knives is available, providing different knife angles, v: 15°, 22.5°, 30°, 45°, 47.5°.

V-notch Knife Tool, Modes of Operation

	Opened Job > Layers Tab > Edit Layer
	Menu Bar->Layer->Edit Layer...

Edit Layer

Layer Name: Layer Color: X

Type:

Tool:

Blade: No default blade is selected for this tool

Code: Value [Buy Online...](#)

Registration Type:

Speed X/Y:

Acceleration:

☒ Depth flute dependant

Depth:

VNotch: ☐ Single Cut ☐ Double Cut ☒ Triple Cut

dW Along:

Across:

Triple Cut:

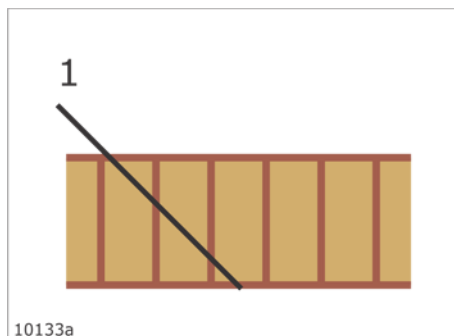
Note:

V-notch Knife Adapters are available for different knife angles: 15°, 22.5°, 30°, 45°, 47.5°.

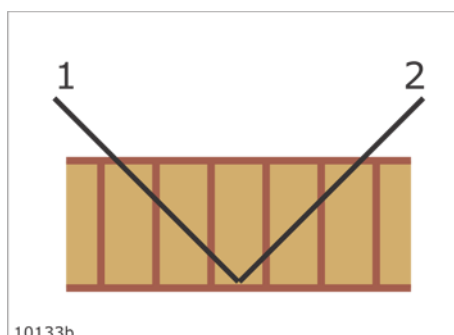
In this chapter, a 45° knife angle is discussed.

The programming and operation will be similar for other angles.

Modes of Operation

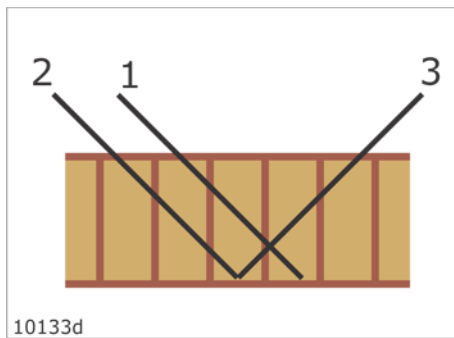


Single Cut



Double Cut

This is the default mode if neither **Single Cut** nor **Triple Cut** are enabled.

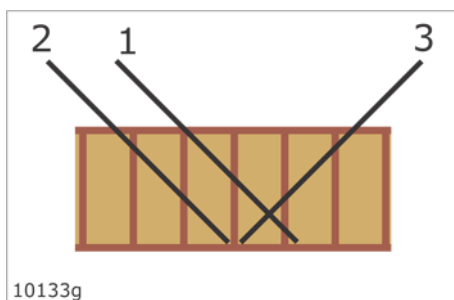


Triple Cut Function

To ensure proper folding of rigid materials, use this function to remove material from the middle of the cut.

Note:

- This function is working along Y only. Flute direction must be along Y.
- The numbers indicates sequence of operation.

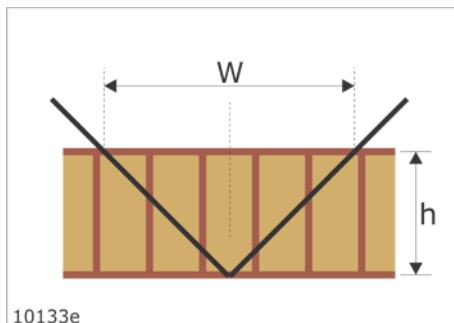


This illustration shows a typical use of **Triple Cut Function**.

The middle wall is not cut by (2) or (3), making the material impossible to fold.

The **Triple Cut Function** (1) cut the middle wall and you can fold the material nicely.

Geometry

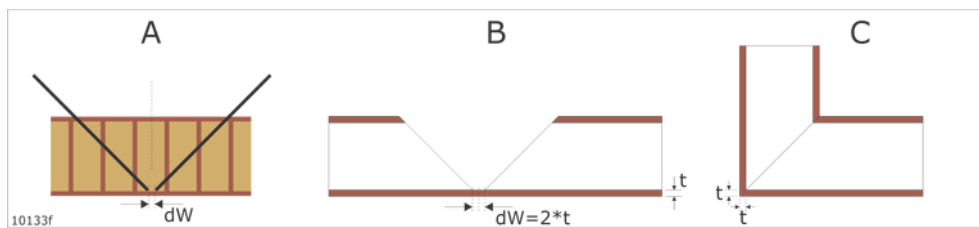


When the knife angle is 45° and you cut through the material, the width of the cut is $W = 2 \times h$.

Folding

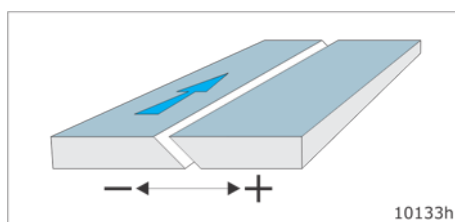
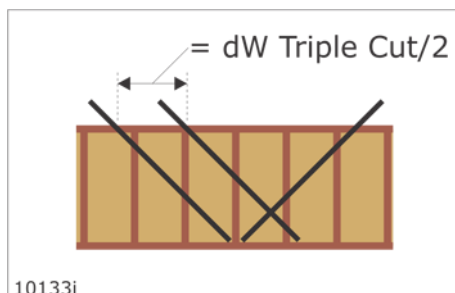
If you prepare a material for folding, the following rules applies:

- Adjust the cutting depth to just above the bottom liner.
- Adjust the cutting width (W) by the adjustment parameter dW. Nominally, the width of the cut has to be increased by $dW = -2 \times \text{bottom liner thickness}$.
- dW limitations: $-20 \text{ mm} < dW < 20 \text{ mm}$ / $-0.8 \text{ in} < dW < 0.8 \text{ in}$.
- Decide if **Triple Cut Function** is needed.



This illustration shows how the parameter dW is used to ensure a nice folding result.

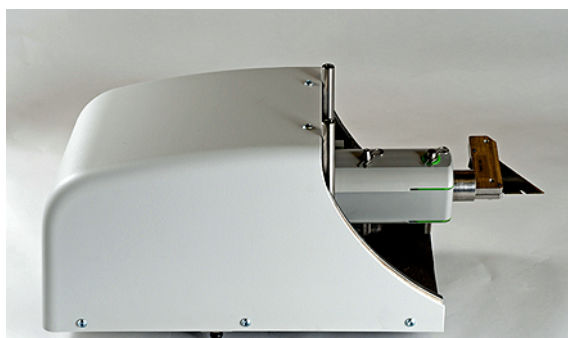
Triple Cut Function, adjustment



Adjustment sign and cut direction

12.6.3 HD Knife Tool

Description



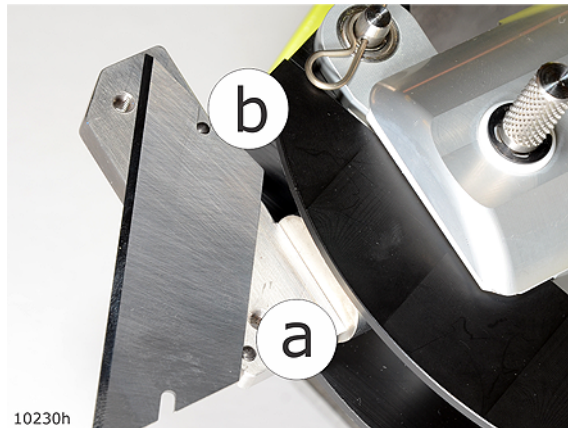
The **HD Knife Tool** mounted on **HDU**.

The **HD Knife Tool** is used for rigid board such as **ReBoard** and **Triple Wall** material.

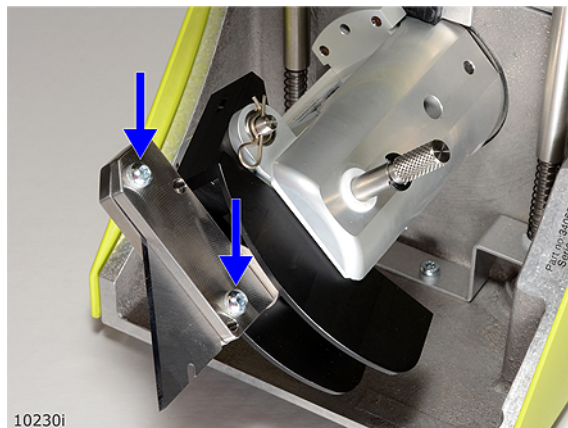
The **Tool** is limited to **Straight Lines** longer than 50mm (2").

The **Tool** is prepared for special, trapezoid shaped **Knife Blades**.

How to replace a Knife Blade

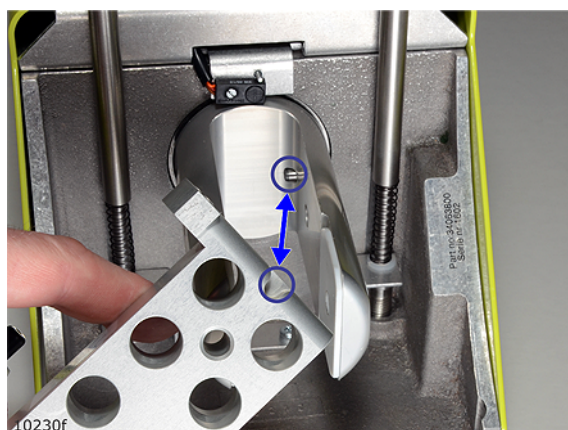


This picture shows how the **Knife Blade** is aligned against two **Guide Pins**.

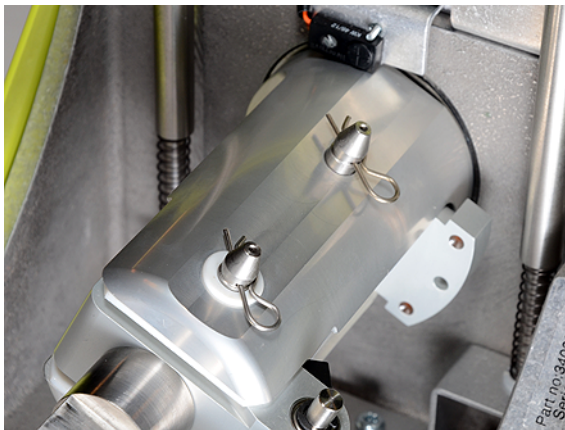


Use these two screws to fix / release the **Knife Blade**.

How to insert / remove the HD Knife Tool



1 Turn the **HD Knife Tool** correctly to fit the **Guide Pin**.



2 Insert the two **Latch Pins**.

3 Insert the **Cotter Pins**.

Tool Adjustments

For this tool, complete the following adjustments:

Adjustment	Description
Lag Setting	The Knife Lag depends upon the Blade Adapter . Nominal value is 10 mm.
Tool Height	Measured automatically, possible to add an Offset Value .
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

12.6.4 Crease Adapter



Using a Crease Adapter allows for smaller crease wheels used on HDU.

Adapters are available for $\varnothing 15\text{mm}$ and $\varnothing 26\text{ mm}$ crease wheels.

12.6.5 Perforation Wheel ø60 mm



Use **Perforation Wheel** to prepare perforation lines at high speed.
Suitable for corrugated board up to C flute (4 mm/0.16 in.).

Perforation Wheel assembly



Parts in assembly



Ensure the path is clean.



Fix cover properly.



Push / pull the perforation wheel in / out from the adapter.

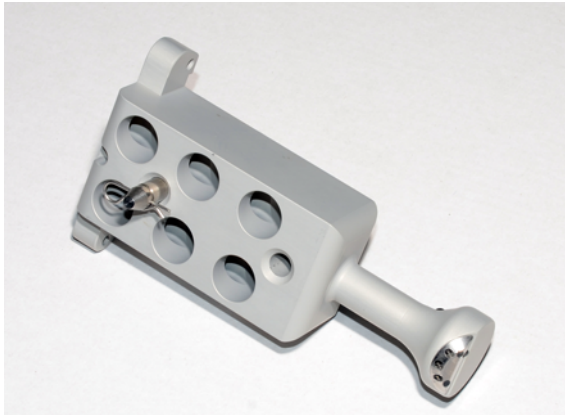
Tool Adjustment

For this tool, complete the following adjustments:

Adjustment	Description
Lag Setting	The Lag value depends upon the Blade Adapter . Nominal value is 0 mm.
Tool Height	Measured automatically, possible to add an Offset Value .
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

12.6.6 Bevel Knife 45



Bevel Knife 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 cutting depth of the Bevel Knife

The default cutting depth for **Bevel Knife** is cut through the entire material.

Define the depth of the bevel cut in the **Layer Setup**.

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

About tool adjustment

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

Use a thin **Folding 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.

For more information about how to run the **Adjustment Wizards**, see the [Tool Configuration](#) chapter

12.7 Foam Knife

Description

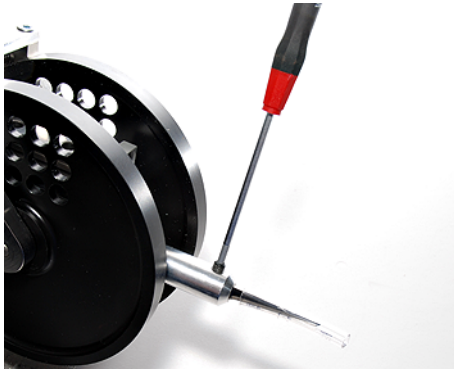


The **Foam Knife Tool Head** is mounted onto the P1-position.

Note: Be careful where to place the **Foam Knife Tool** when not in use.

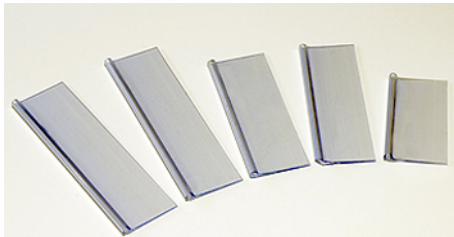
If the **Tool Head** is left on a table surface, the **Knife Blade** might be exposed, as the material hold down wheels moves up.

How to replace a Knife Blade



Loosen the fixing screw, replace the **Knife Blade** and fix it again.

No additional adjustments are necessary, as the tool height is measured automatically.



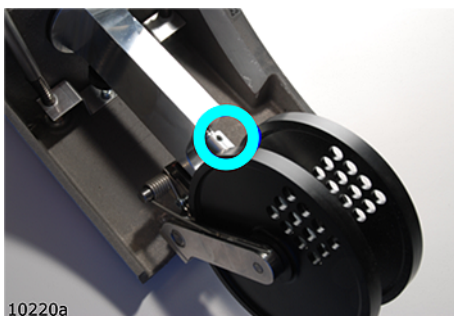
A set of **Knife Protection Handles** are available.

Use them for safe knife handling.



When not in use, protect the **Knife Blade** using the handle.

How to replace the Knife Adapter



Loosen the fixing screw, replace the adapter and fix it again.

No additional adjustments are necessary, as the tool height is measured automatically.

Disable Material Thickness Measurement



Opened Job->Layers->Edit Layer.

For the **Foam Knife Tool**, the **Disable Material Thickness Measurement** function is available. Use this function if:

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

When the **Disable Material Thickness Measurement** function is enabled, the following rules applies:

- Depth is referenced from bottom (top of cutting underlay).
- During **Tool Up** movements, the knife is lifted to its top position.

Cutting Quality

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

- Reduce the **Cutting Speed** (from **Opened Job->Layer**).
- Cut in two or three passes, each pass going a step deeper (*Multi Pass*).

Tool Adjustment

For this tool, complete the following adjustments:

Adjustment	Description
Lag Setting	The Knife Lag depends upon the Blade Adapter . Nominal value is 3 (5) mm.
Tool Height	Measured automatically, possible to add an Offset Value .
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

12.8 HPMU - High Power Milling Unit

12.8.1 Introduction

Spindle motor	
Power rating (max)	3 kW
Cooling system	Liquid cooling
Shank size (max)	8 mm
RPM (max)	60000
Tool change	Pneumatic
Vibration sensor board	No

HPMU chucks



Different chucks are available from <http://www.esko.com/en/store/kongsberg-bits-blades/>

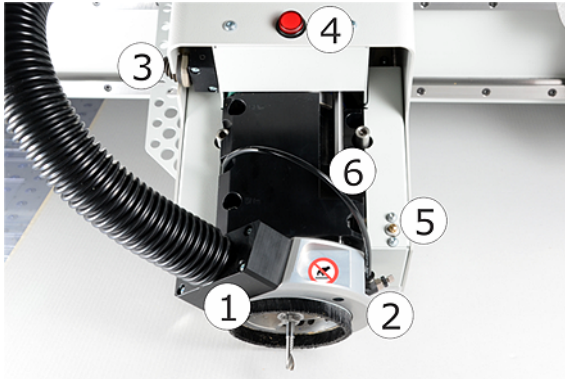
Replacing a chuck

Replacing a chuck is described in detail in *Chuck Change and Cleaning* on page 96.

This chapter is included just to remind you how important it is to use the **Chuck Changing Tool** available and a dummy bit to ensure correct mounting:

<p>From left: Chuck tool, dummy bit with right diameter for the chuck, and chuck.</p>	<p>Chuck change assembly.</p>	<p>Ready to be inserted into the spindle.</p>

12.8.2 Tool Head description



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.
3. **Chuck Open/Close**. The shown position is closed.

Note: To protect the chuck from damage and the spindle from contamination, do not close the chuck over time without a dummy bit inserted.

Never start the spindle without a bit / dummy bit in the **Chuck**.

4. **Warning Lamp** for spindle running.
5. **Air Clean Button** to help remove contamination.
6. **Locking Screw** for the suction house.



1. **Router Bit**.
2. **Chuck**. The **HPMU** is equipped with one 6 mm chuck on delivery.
3. **Spindle**

HPMU Park Position



A **HPMU Park Position** is available on the gallows stand.

Use the park position for safe **HPMU Tool Head** storage.

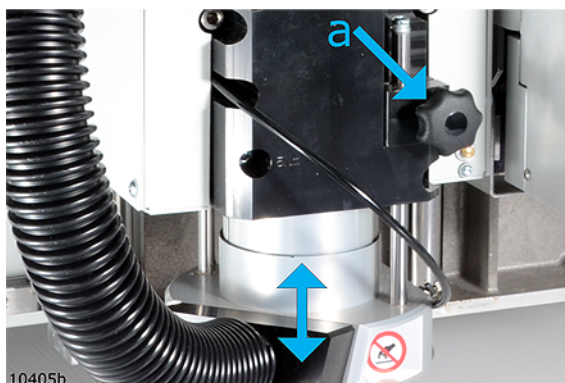
Note: For safety reasons, always insert a **Dummy Bit** when parking.

Chiller / HPMU 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 **HPMU**, you can lock the **Suction House** in any height; still, it is allowed to move upwards.

This function is useful in order to:

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

Procedure:

1. Loosen lock screw (a).
2. Adjust suction house to desired height.

Spindle RPM limitations

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

Using **Milling Bits** with extended length at high RPM can also be dangerous.

Therefore, using long **Milling 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.

12.8.3 Safety Issues

Unattended Operation

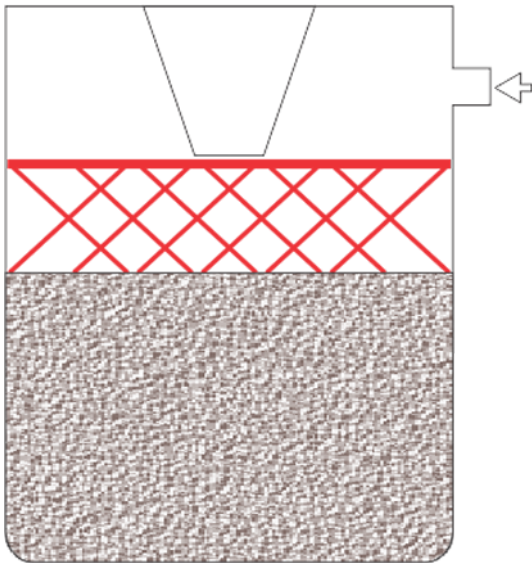
Depending upon the material processed, milling introduce some risks.

It is a good rule to keep an eye on a milling job being executed.

Pay special attention to:

- Do not leave the machine running if the **Vacuum Cleaner** can be over-filled. This might cause damage.
- Ensure the filter inside the **Vacuum Cleaner** is cleaned regularly.
- Be aware the risk of suction tube clogging.
- Be aware the risk of suction house clogging.
- Milling MDF or other fine dust materials requires extra attention in order to keep the **Vacuum Cleaner** filter clean.

Vacuum Cleaner full



- Follow the **Vacuum Cleaner** filling level carefully.
- Empty the container before the level reach the inlet position (indicated in red).

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 broken **Router Bit**.

Eye protection

Use eye protection when working with **HPMU**.

Hearing protectors

The noise generated by milling varies with the material being 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 it is normal that the **HPMU** appears to be hot during operation.

Clean surface

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

12.8.4 Precautions

Spindle Motor Power Consumption Supervision

Spindle power: 80%

10155

Machine Panel->Spindle Power

The HPMU spindle is prepared for continuous operation between 0 – 100 % Watt.

A power load of 70-80% will allow good working conditions for the **Spindle Motor**.

Too high **Spindle Power** consumption indicates critical conditions for the motor and immediate actions should be taken:

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

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

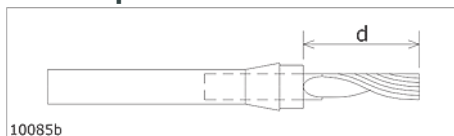
Use of Non-Balanced Bits



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 (HPMU)

Keep distance d small



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

Use bits with short cutting lengths for thin materials.

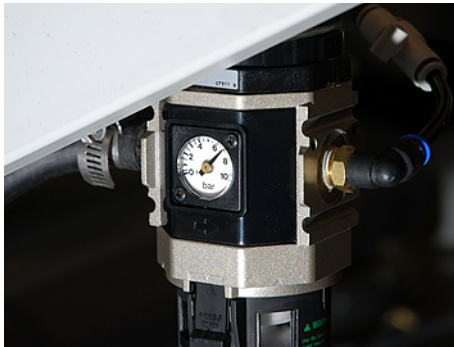
Chuck Open/Close valve operation



Never operate the **Chuck Open/Close Valve** while the **Spindle** is running.

This will destroy the Spindle.

Air Pressure and Quality



Never run IBAG spindle with **Pressurized Air** disconnected.

This will destroy the **Spindle**.

Use Clean Air

The **Spindle** is sensitive for the **Pressurized Air** quality.

Regularly check the **Air Pressure Reduction Valve** according to the [Maintenance Description](#).

Maintain Bit Clamping



Un-proper **bit clamping** may cause the bit to slip in the **chuck** and damage the **Table Top**.

1. Keep the **bit shaft** clean.
2. Avoid greasy fingers.
3. Clean the **bit shaft** with acetone if necessary, but use only dry cotton tips on the chuck.
4. Maintain **Pressurized Air** supply of 7 bar.
5. Follow procedures strictly: [Chuck Change and Clean](#).

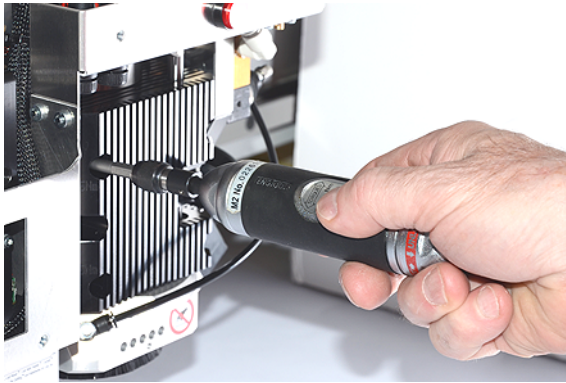
Long Term Storage



More than 4 weeks storage of a **Spindle** or a **HPMU** requires:

1. Turn the unit upside down about 20 turns every 4 weeks.
2. The **Spindle** must be stored horizontally.

Consider having a Replacement Spindle



If **HPMU** 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.

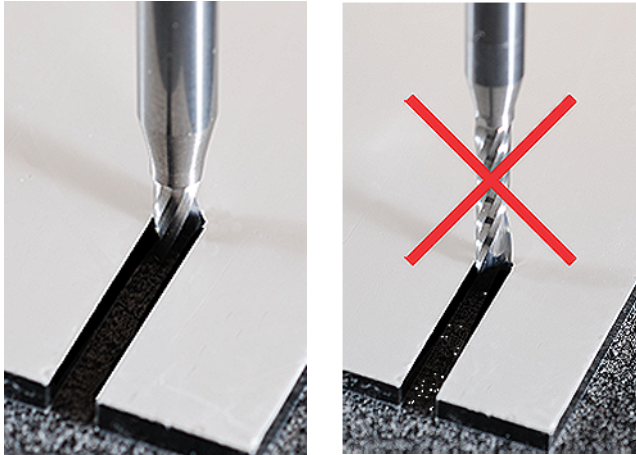
Empty Vacuum Cleaner in time



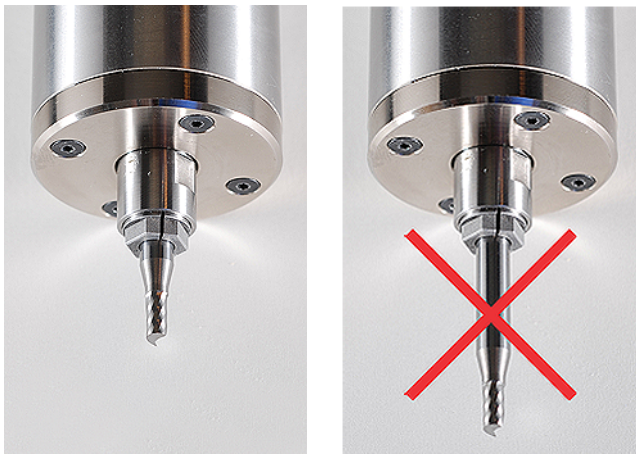
1. Do not leave the machine running if the **Vacuum Cleaner** can be over-filled. This might cause damage.
2. Be aware the risk of suction tube clogging.

12.8.5 Routing Advice

Milling Bits



For thin materials, use bits with short **cutting length**.

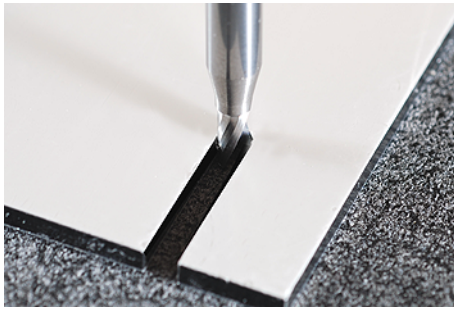


For best performance and minimum wear, do not let the bit stick out more than necessary.



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 diameter** (3-4 mm; 0.12-0.16 in) are more balanced than bits with larger **cutting diameter**

Thus, they can run with higher RPM, normally 60.000.

Use large diameter bits (5-6 mm; 0.20-0.24 in) when needed only.

Typical use is to get rid of the chips in thick materials.

Max RPM (HPMU) 60.000

Router Bit Edges are brittle.

Never let bits touch each other, or other hard surfaces.

Always store in proper container.



Acrylic Bits or Multi Purpose Bits



1. **Acrylic Bits** (A) are polished, extra sharp for acrylic, wood etc.
2. **Multi Purpose Bits** (MP) have a higher wear resistance, and are suitable for aluface, plastics, MDF, plywood, wood etc.

Multi Purpose Bits can be identified by a small tooth at the tip (left hand bit on the picture).

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 Consumption**.

Number of Passes in Thick Materials

The **Number of Passes** depends on **Material Type**, **Milling Depth** and **Bit Diameter**.

Use a **Pass Depth** that makes the groove free of chips, normally that is a depth equal to the **Milling Diameter**.

Material Hold Down

Material Hold Down may be a limiting factor. Small parts cut loose can be a problem.

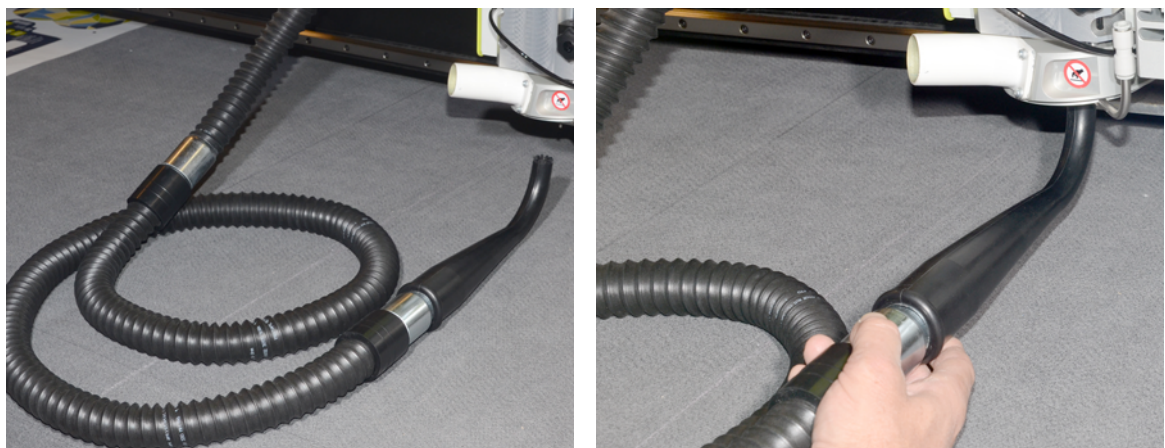
This can be done to improve the situation:

1. Use **Milling Bits** with smaller **Milling diameter**.
2. Cover unused table area to increase **Vacuum Hold Down Level**.
3. Use **Wash-Out functions** instead of creating small waste parts.

Using other tools in combination with the HPMU

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.

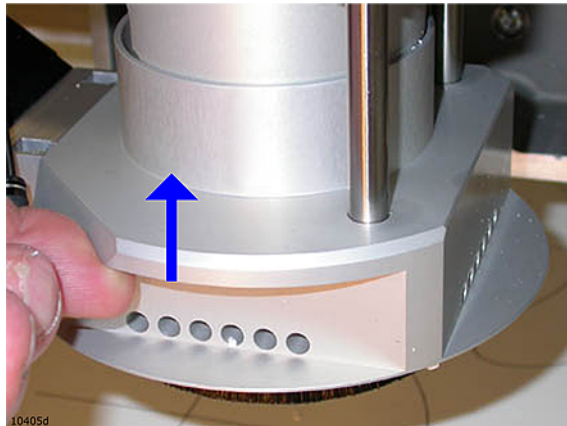
12.8.6 Cleaner Device



Cleaning the suction house is simple using a **Cleaner Device**, which is available as an option.

12.8.7 Bits and Bit Change

How to insert / replace a Router Bit



1

Ensure the **Spindle** is not running - the lamp is dark.

Mind the sharp bit, and move the **Suction House** up.

Lock the house in its up position.



2

Observe that the **Router Bit** is not rotating.

Use a cloth to hold the bit.

Move the **Chuck Open/Close** lever down to open the **Chuck**.

Put the bit in a proper storage container.

Insert a new **Router Bit**.

Close the **Chuck**



3

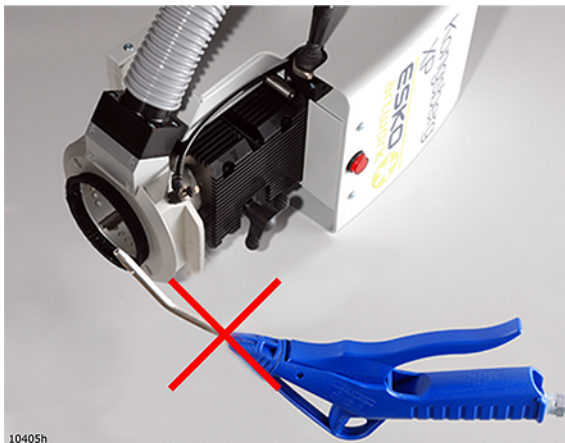
Only the round part of the shaft should be inside the **Chuck**.

See the **Bit Length and Position** – chapter for more information.



4

Release the **Lock** to allow the **Suction House** moving down to its down position.

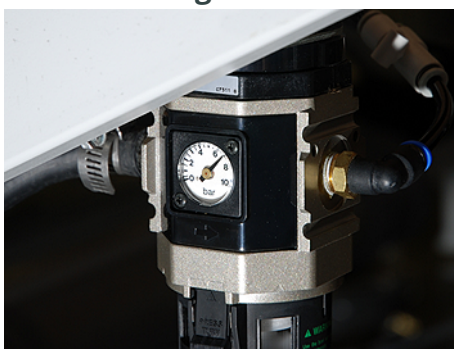


5

Regularly, perform a **Chuck** cleaning, following the dedicated procedure; [Chuck Change and Cleaning](#) on page 96.

Note: Never use **Compressed Air** for cleaning.

If a Milling Bit is stuck



If a **Milling Bit** is stuck in the **chuck**, the probable cause is low **air pressure**.

To release a **Milling Bit** from the **chuck**, a pressure of 7 bar is required.

If necessary, check the **Pressurized Air Regulator Valve**, or the **Pressurized Air** source.

If the bit is still stuck, see the [Chuck change and cleaning](#) section about how to unscrew the chuck.

12.8.8 Chuck Change and Cleaning

Clean the **taper** and the **chuck** regularly for proper operation and optimum life time; at least once a week, but more often if necessary.

Follow the procedure strictly.

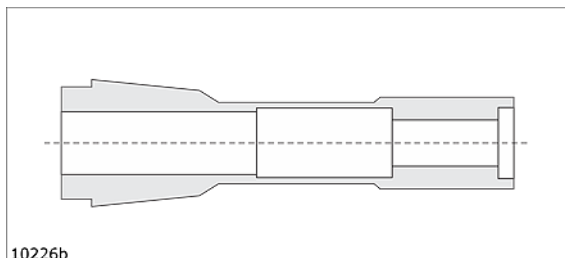
Normally, the **chuck** has a long lifetime.

Extended vibrations or impacts may hurt the **chuck**, and cause bad milling results.

Trying a new **chuck** is the easiest way to identify if the **chuck** is the problem.

Running with a bad **chuck** will also increase the spindle wear.

Procedure



1

Place the **Tool Head** on the table.
Open the **chuck** and remove any bit.

Note: Never apply **Compressed Air** for cleaning.

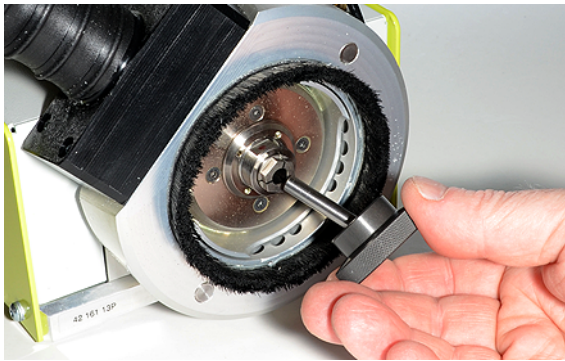


2

Apply the 17 mm key to hold the **Spindle Rotor**.

Note: Do not turn the rotor when **Chuck** is in open position.

This might damage the **Spindle**.



3

Enter the **Chuck Tool** with a **Dummy Bit** into the **chuck**.



4

Hold the rotor with the 17 mm key and unscrew the chuck using the **Chuck Tool**.



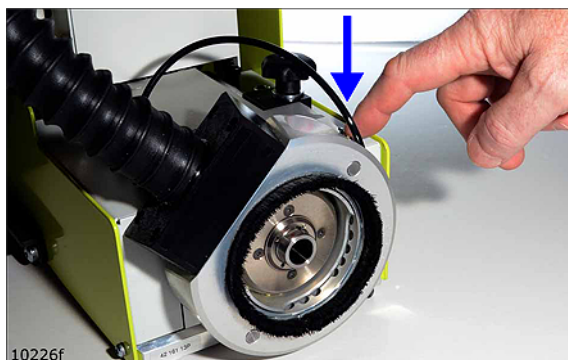
If the bit is stuck, hold the rotor with the 17 mm key and unscrew with a 12 mm key.

Note: **Tool Open** must be pressurized.



5

Use the **Taper Brush** to clean the **Taper**.



6

Push the **Air Clean Button** to help remove contamination.



7

The **Taper Brush** must be absolutely free from grease or oil.

If necessary, you must clean it with alcohol before you use it.

This is very important, as it has direct consequence for the clamping force.



8

Apply small quantities of grease to the threads of the **chuck**, and to the outer cone and cylindric surface of the chuck (green arrows).

Avoid the clamping area (red arrow).

Do not use oil, as it could enter the clamping area and reduce the clamping force.



9

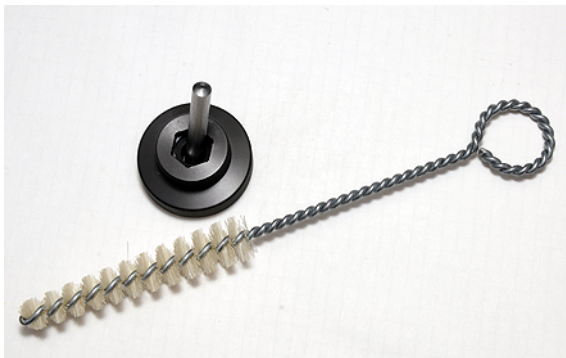
Torque up the chuck by hand, using the **Chuck Tool** with a **Dummy Bit**.

Hold the rotor with the 17 mm key.



10

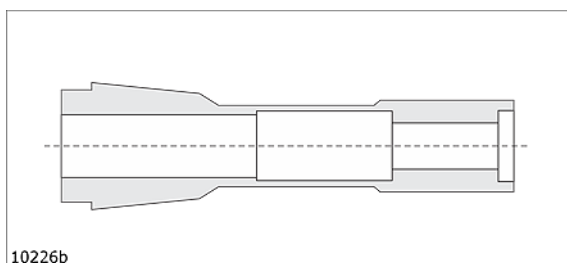
Close the **chuck** on a **Dummy Bit**.



11

Chuck Maintenance Kits are available in the **Esko Store** on www.esko.com.

12.8.9 Bit Slipping, Chuck Change



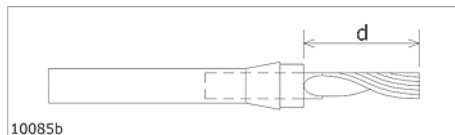
Even though the **chuck** is expected to have a long lifetime, replace it immediately if you experience any problems as:

1. Bit slipping.
2. Bit vibrations.

When replacing the **chuck**, follow instructions in [Chuck Change and Cleaning](#) on page 96.

New **chucks** are available from Esko store.

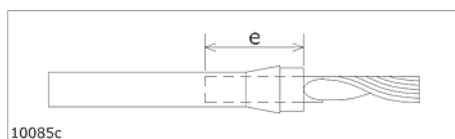
12.8.10 Bit Length and Position



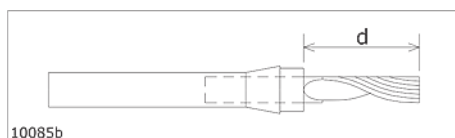
Keep distance d small.

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

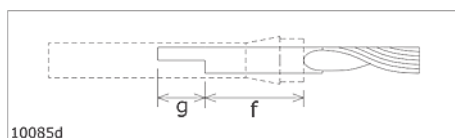
Use bits with short cutting lengths for thin materials.



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.

12.8.11 Tool Adjustment

Complete the following adjustments:

Adjustment	Description
Tool Height	Measured automatically, possible to add an Offset Value .
Tool Offset	Adjust offset relative to Laser Pointer .

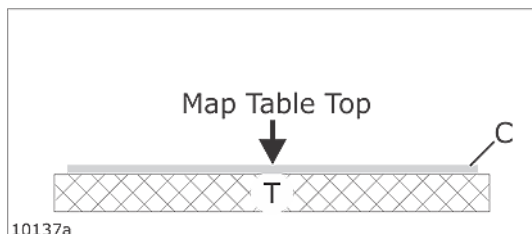
For more information about how to run the **Adjustment Wizards**, see the [Tool Configuration](#) chapter

Notes regarding Tool Height adjustment:

When properly adjusted, the **Router Bit** should barely touch the top surface of the material.

12.8.12 Table Top and Tool Height Adjustment

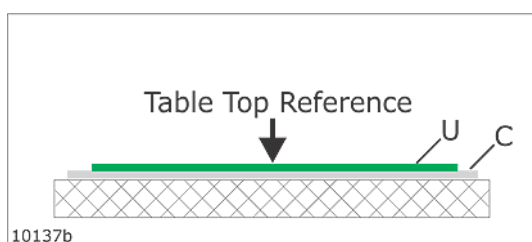
The following rules apply when adjusting HPMU



T = **Cutting table**

C = **Cutting Underlay**

Map table top function is carried out on top of the **Cutting Underlay**.



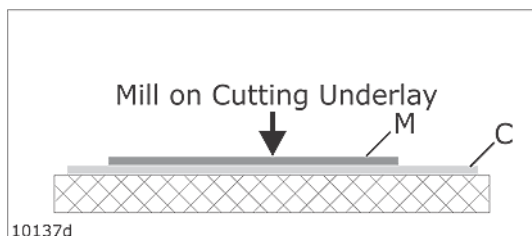
U = **Milling Underlay**

The **Table Top Reference** function is carried out on top of the **Milling Underlay**

The **Tool Height** is measured automatically.

If, after a test cut, you want to modify the **Milling Depth**, this is possible from the **Tool Height Adjustment** dialog.

The following rules apply when Milling:

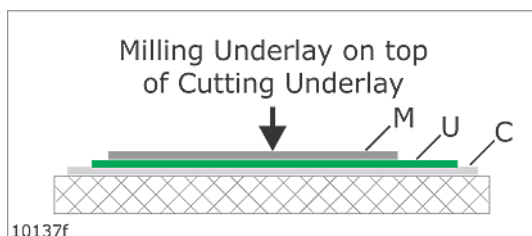


Mill on Cutting Underlay (C):

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.

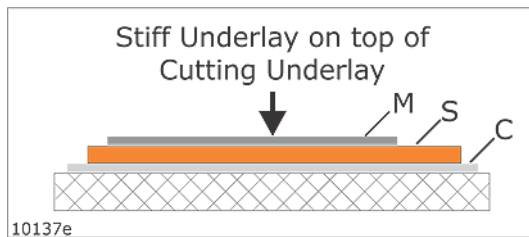
Tool Height will follow the mapped tabletop.



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.

12.8.13 Miscellaneous

Warm Up



Machine Panel Toolbar->Warm Up

To protect the **Spindle**, mandatory **Warm Up** is implemented.

If the **Spindle** has been inactive for 8 hours or more, a 3 min. **Warm Up** is required.

If the **Spindle** has been inactive for 4 weeks or more, an extended sequence is required, called **Run In**.

This takes 20 minutes.

Suction House

Clean the **Suction House** when necessary.

Use 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 mat:

Prepare program to make a file that covers the actual area.

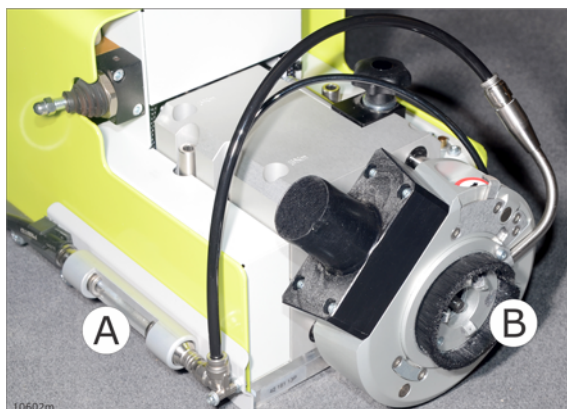
Set "bit size" to 65 mm (2.5 inch).

Hint:

- Make a file name that reflect the size used.
- Prepare **Layer Setup** with low spindle speed, zero depth, and maximum feed.
- Insert the **Dummy Bit** into the **chuck**.
- Adjust the brush height until the brush barely touches the mat surface.

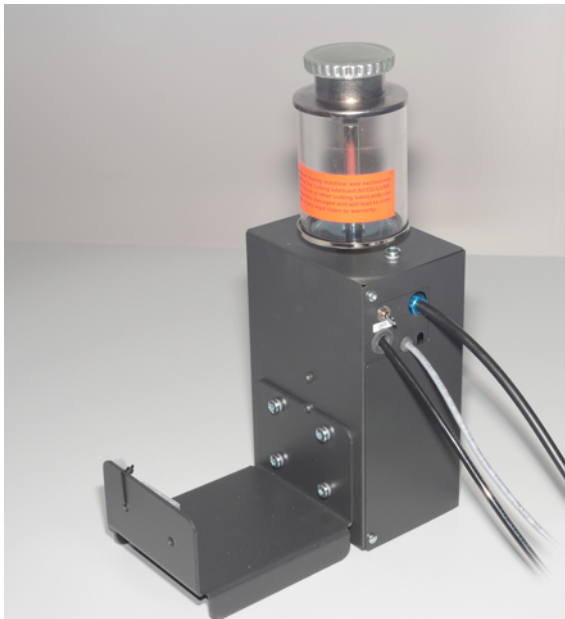
12.8.14 LubriCool

Introduction



LubriCool mounted on HPMU.

- A - inspection window.
- B - Suction cup with nozzles.



LubriCool control unit

How to use



LubriCool is on when the Vacuum Cleaner is on.

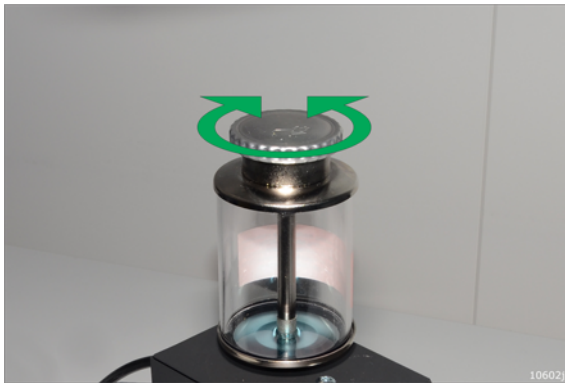
For materials where lubrication is not suitable, use the ON/OFF switch on the LubriCool Control Unit to switch off lubrication.



Inspection Opening

When the LubriCool unit is on, you can see light in the control relays inside the unit.

Oil



For LubriCool, use this oil only:
Accu-Lube LB-5000

Use Nozzle Unit or Suction Ring



Nozzle Unit



Suction Ring

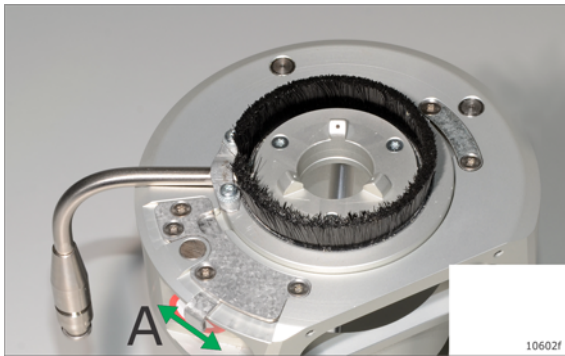
is delivered with one **Nozzle Unit** for the **LubriCool** function and one **Suction Ring** with just a brush, and with bigger suction opening.

- Use the **Nozzle Unit** when the **LubriCool** function is beneficial only!
- For all other materials, especially MDF, use the **Suction Ring**!

Note: It is crucial for proper operation that these guidelines are followed.

How to interchange the **Nozzle Unit** / **Suction Ring**

Cleaning



Proper cleaning is crucial for correct operation.

- Release locker A and remove the nozzle unit.
- Use vacuum cleaner to clean the HPMU suction house.



- Use vacuum cleaner to clean the nozzle unit.

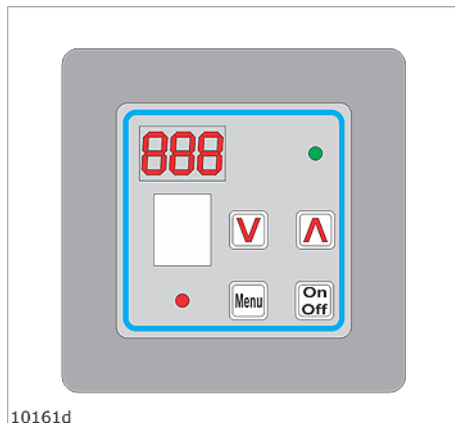
12.9 Chiller no 1 for HPMU

12.9.1 Introduction



This is chiller 1, replaced in October 2016 by a new model named chiller2016.

12.9.2 Chiller Heater, Operation



Notes:

1. The **Chiller Heater** is optional.
2. The **Chiller Heater** must be filled with water before connecting mains.
3. The **Chiller Heater** is correctly configured when shipped from the factory. Normally, there is no need for modifications.

Some operating instructions are included here if any modifications are still needed.

	Press On/Off button to start the heater. The letters BCS are displayed. To turn unit off, push and hold the button for 3 seconds.
	Media temperature is displayed.
	Green light on - the unit is on, and the specified temperature is reached. Green light flashing - heating elements are operating.
	Red light on – fault condition (over-heating, cable breakdown)

Program selection

	Press and hold the Menu button for 3 sec.
	Use arrow keys to select program
	Press Menu button to confirm selection.

Temperature setting

	Use arrow keys to select temperature
	Press Menu button to confirm selection.

Programs available

Program	Temperature range from (°C)	Temperature range to (°C)	Hysteresis
0	Frost protection		5
1	10	85	7
2	10	70	7
3	10	50	7
4	10	85	4
5	10	50	4
6	10	85	5
7	10	50	5

Factory Setting

Correct factory setting is Program = 5 and temperature = 26 oC (Chiller with heater).

12.9.3 Chiller, Error Conditions



One common error signal is routed from the **Chiller** system to the inverter and further into the control system.

The following error conditions are monitored:

- Temperature out of range (high and low)
- Liquid flow too low (less than 0.5 l/min). The signal is 1 minute delayed.
- Temperature sensor failure

If any chiller failure occurs, you have to 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

During normal operation, the cooling medium temperature is displayed.

More information is available from the Operating instructions for the chiller.

12.10 Chiller2016 for HPMU

12.10.1 Introduction



Specifications

Dimensions

W x D x H = 480 x 580 x 430 mm / 19 x 23 x 17 in.

Weight

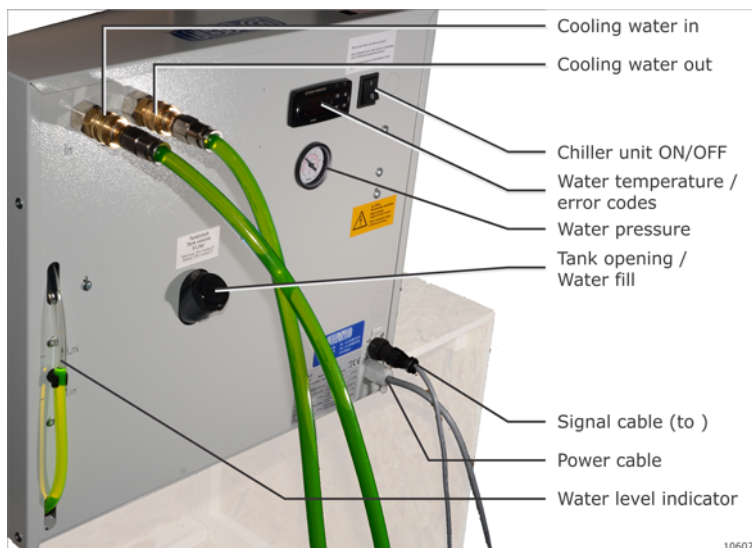
Empty: 40 kg / 88 lbs.

Filled with water: 49 kg / 108 lbs.

Internal heater

This chiller is equipped with an internal, automatic heater.

Chiller Unit



12.10.2 Startup

Ensure the following pre-requisites are in place for correct startup:

- **Note:** Never start the chiller without liquid.
- Signal cable (to inverter) is connected to the chiller unit.
- Chiller fluid level should be MAX. If not, fill with fresh water.
- If water temperature is too low, wait for the temperature to attain proper value (19°C / 66°F).

The chiller is equipped with an internal, automatic heater.

First time startup

- Check that the supply matches the rated voltage.
- Check that the electrical connection has been made correctly.

12.10.3 Error Conditions



One common error signal is routed from the **Chiller** system to the inverter and further into the control system.

The following error conditions are monitored:

- Temperature out of range (high and low)
- Water level too low
- Liquid flow too low (less than 0.5 l/min). The signal is 1 minute delayed, to be able to fill water hoses at startup..

During normal operation, the cooling medium temperature is displayed.

If any chiller failure occurs:

- Alarm signal is generated.
- Chiller will stop.
- Look at the chiller display to see the real reason for the problem:

Code	Description
AL	Water level or water flow too low. Check for correct water level in the Water Level Indicator on Chiller front.
H1	Temperature of cooling medium too high, > 35°C / 95°F
L1	Temperature of cooling medium too low, < 19°C / 66°F

Continue after error situation

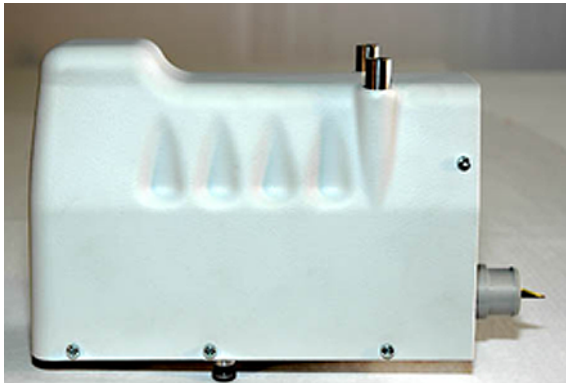
- Find root cause for the error situation and fix it. Flow too low is normally caused by a squeezed water hose.
- Switch chiller unit OFF and ON again.

More information is available from the Operating instructions for the chiller.

12.11 VibraCut

The **VibraCut** is available in two models:

VibraCut



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

HF VibraCut (High Frequency VibraCut)



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.

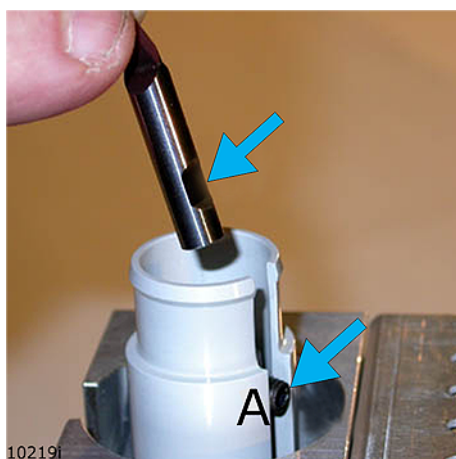
Common to both models:

- To reduce material tear, a foot is available.
- The same set of **Knife Adapters** can be used.

Replace Knife Blade



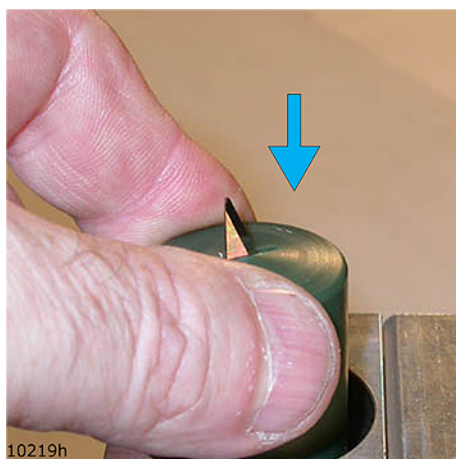
Pull straight out to remove the **Knife Foot**.



Loosen the screw A and replace the **Knife Blade**.

Ensure the **Knife Blade** has correct position relative to the screw.

Push the **Knife Blade** down while the screw is fixed.



Extreme care should be taken when inserting the **Knife Foot** again.

Keep fingers away from **Knife Blade** as illustrated at left.

Tool Adjustment

For this tool, complete the following adjustments:

Adjustment	Description
Lag Setting	The Knife Lag depends upon the Blade Adapter .

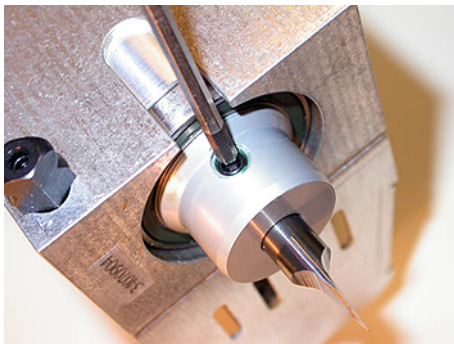
Adjustment	Description
	Nominal value is 0-3 mm.
Tool Height	Measured automatically, possible to add an Offset Value .
Tool Rotation	Adjust Tool Angle tangential to Moving Direction .
Center Offset	Adjust Tool sideways until centered.
Tool Offset	Adjust offset relative to Laser Pointer .

For more information about how to run the **Adjustment Wizards**, see the [Tool Configuration](#) chapter

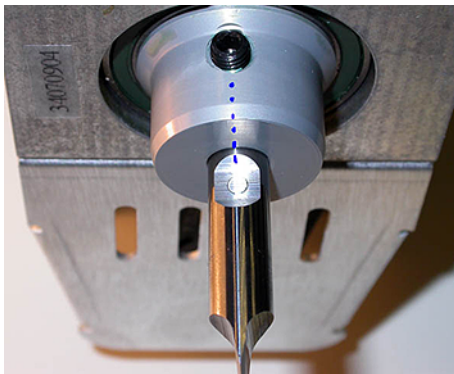
12.12 Rigid Material Knife (RM Knife Tool)



Replace Knife Blade



Use a 3 mm **Allen key** to fix / loosen the **Knife Blade**.



Ensure the **Knife Blade** is correctly aligned.

No additional adjustments are necessary, as the tool height is measured automatically.

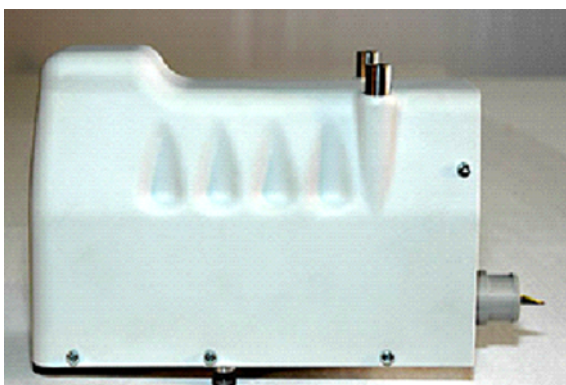
Tool Adjustment

For this tool, complete the following adjustments:

Adjustments	Description
Lag Setting	The Knife Lag depends upon the Blade Adapter . Nominal value is 0-4 mm.
Tool Height	Measured automatically, possible to add an Offset Value .
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

12.13 HiForce Knife



HiForce Knife is a general purpose knife tool suitable for cutting a wide range of materials.

As the name indicates; this tool is prepared for a higher tool pressure compared to the **Static Knife**.

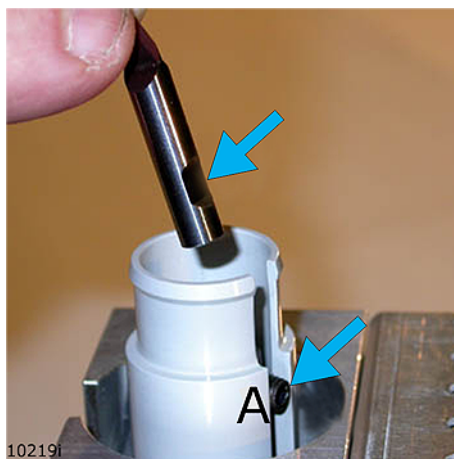
The tool is prepared for a wide range of **Knife Blades**.

To reduce material tear and also to keep the material down as the **Knife Blade** is pulled out, a **Knife Foot** is available.

Replace Knife Blade



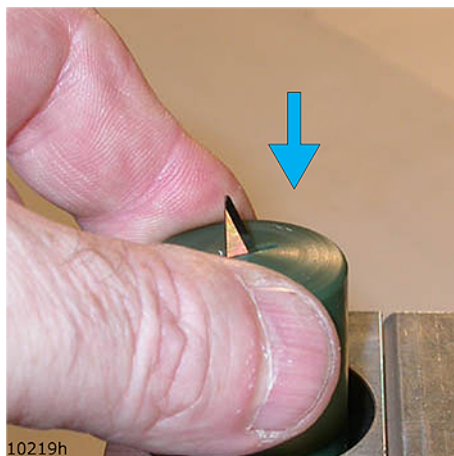
Pull straight out to remove the **Knife Foot**.



Loosen the screw A and replace the **Knife Blade**.

Ensure the **Knife Blade** has correct position relative to the screw.

Push the **Knife Blade** down while the screw is fixed.



Extreme care should be taken when inserting the **Knife Foot** again.

Keep fingers away from **Knife Blade** as illustrated at left.

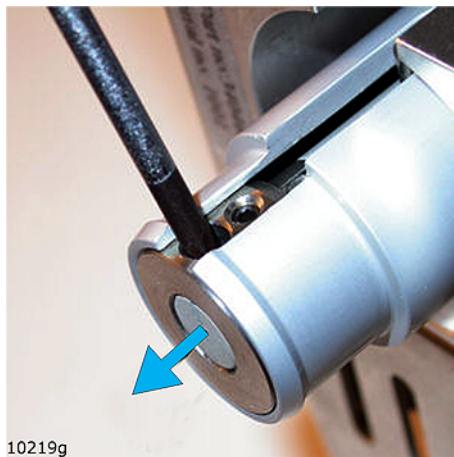
Tool Adjustment

For this tool, complete the following adjustments:

Adjustment	Description
Lag Setting	The Knife Lag depends upon the Blade Adapter . Nominal value is 0-3 mm.
Tool Height	Measured automatically, possible to add an Offset Value .
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

Replace Knife Adapter



To remove the **Knife Adapter**, just pull it out from the holder.

12.14 Psaligraphy Knife

Note: iPC version 2.0 or higher is required to run this tool.



Psaligraphy Knife is a tool for cutting of fine details in paper and folding carton.

Replace Knife Blade



For **Knife Blade** change, remove the foot.
The locking screw will always point towards the cutting direction

Note: Be extremely careful when mounting the foot.

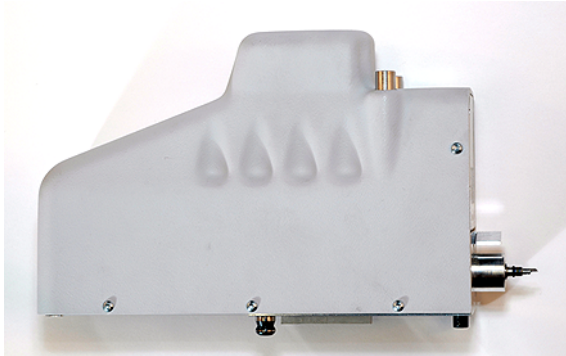
Tool Adjustment

For this tool, complete the following adjustments:

Adjustment	Description
Lag Setting	The Knife Lag depends upon the Blade Adapter . Nominal value is 0-3 mm.
Tool Height	Measured automatically, possible to add an Offset Value .
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 PressCut



PressCut is a special knife tool for vinyl cutting.

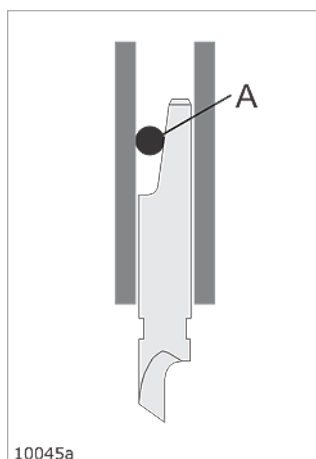
The **Cutting Depth** is controlled by the downward knife pressure.

The pressure is adjustable from **Opened Job->Edit Layer** dialog.

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

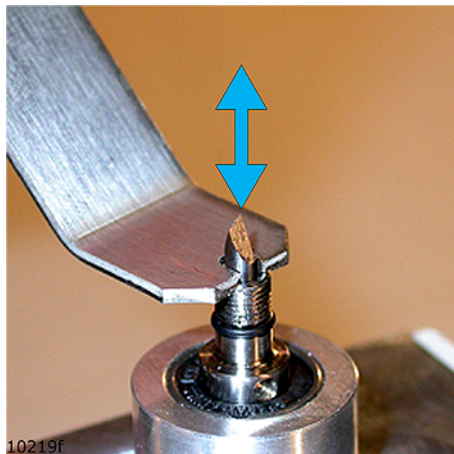
The tool is prepared for a wide range of **Knife Blades**.

Replace Knife Blade



This figure shows how the **Knife Blade** is fixed inside the **PressCut Knife Tool**.

The friction between the **Alignment Pin A** and the **Knife Blade** keeps the **Knife Blade** in place.

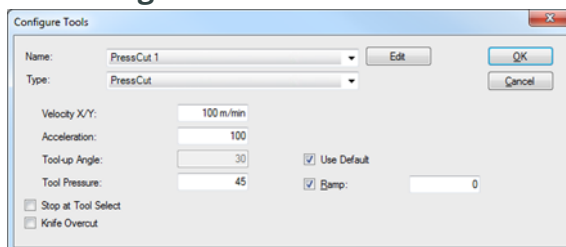


A special hand tool is available as an aid when replacing **Knife Blades**.

Use this hand tool when removing and inserting **Knife Blades** into the tool.

When inserting a new **Knife Blade**, ensure the blade is correctly positioned relative to the **Alignment Pin**.

Configure Tools



Tool Pressure

PressCut can run with a **Constant Tool Pressure** or a **Speed Dependent Tool Pressure**.

Both parameters are specified in the **Configure Tools** or **Opened Job->Layer** structure.

Constant Tool Pressure

In the dialog, specify the **Tool Pressure**.

The pressure is entered as a gram - value from 40 to 700 grams.

The **Knife Pressure** is modified if **Speed Dependent Tool Pressure** is specified, see below.

During the tool down movement, the knife moves down until the material surface is detected and the proper **Knife Pressure** is achieved.

The **Knife Pressure** needed will vary depending upon the material.

For a typical **Vinyl Cutting Job**, a recommended start parameter is **Knife Pressure** = 65-70 gram and **Speed Dependent Tool Pressure** = 50%.

Note:

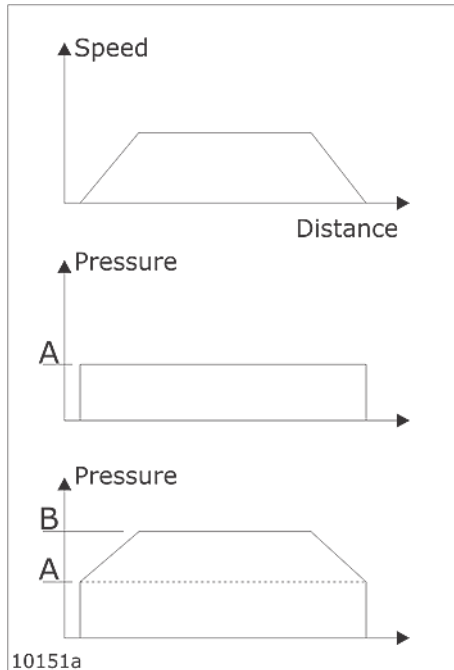
For the **PressCut** to work properly, a sharp **Knife Blade** is critical.

Pay special attention to the tip of the **Knife Blade**, as it is easy to break.

Speed Dependent Tool Pressure

In the dialog, specify **Ramp** and a **Ramp Value**.

The **Ramp Value** is entered as a % - value.



The upper curve illustrates the speed of the machine when executing a line.

Curve A illustrates the **Knife Pressure** if the **Speed Dependent Pressure** is set to 0; the pressure is constant from start to stop.

The **Knife Pressure** level is as specified by the **Knife Pressure** parameter, see previous chapter.

Curve B illustrates the **Speed Dependent Tool Pressure**.

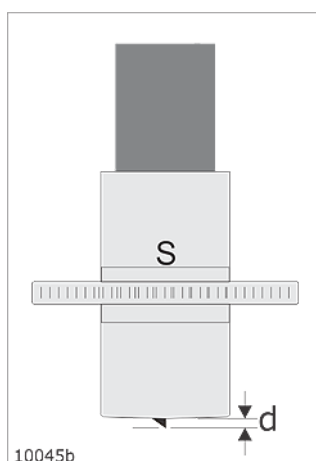
Ramp Value is set to 100.

When running at full speed, the pressure is the double of the **Knife Pressure** A.

This function is useful as it allows a lower pressure in both ends of a line where the speed is low at the same time as you get a higher pressure when running at full speed.

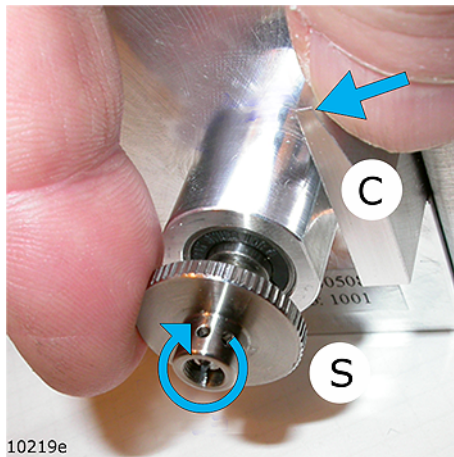
Note: The maximum **Ramp Value** is 200%.

Foot solution



Normally, the **PressCut Knife Tool** is used without the foot mounted.

When the foot is mounted, the **Cutting Depth** d is controlled by the adjustable screw S.



Procedure:

1. Press clamp C as indicated to lock the **Knife Shaft**.
2. Turn the screw S to adjust the **Cutting Depth**. When seen from the **Knife Blade** side, a clockwise adjustment will increase the **Cutting Depth**.

12.16 RotaCut

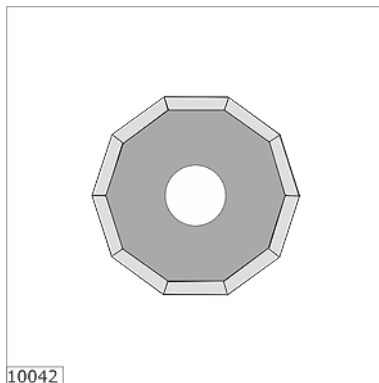


RotaCut is a special tool for cutting light materials, as thin fabric.

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.



RotaCut is prepared for **Decagonal Knife Blades**, $\varnothing 25$ mm / 1 inch.

How to replace the Knife Blade



1

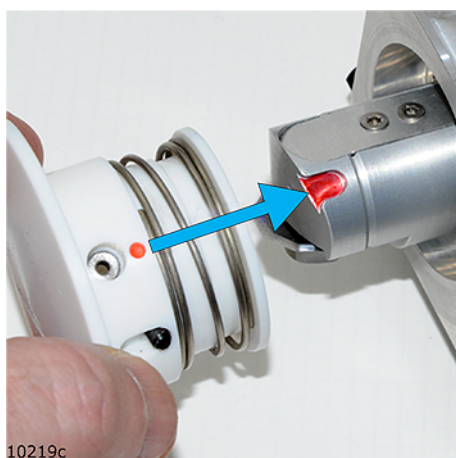
Use the spanner and the hexagonal screw driver to remove the **Knife Blade** fixing nut.



2

Carefully remove the old **Knife Blade** and insert the new one.

Ensure the **Knife Blade** is properly seated.
Mount the nut and fix it properly.



3

Observe the **Guide Pin** in the foot and the groove in the **Tool Shaft**.

Position the foot onto the **Tool Shaft** as shown at left.

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 Blade**.



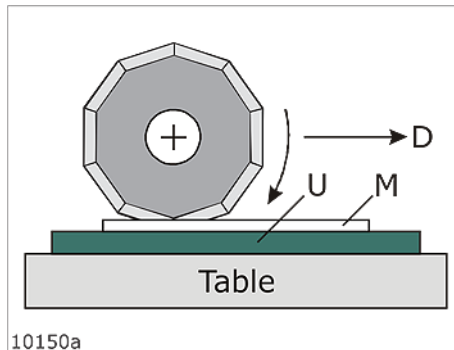
4

Verify by hand that the foot movement is smooth.

Tool Adjustment

RotaCut is adjusted in the same way as the other C tools regarding rotation angle and offset.

Tool Height is manually adjusted:



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

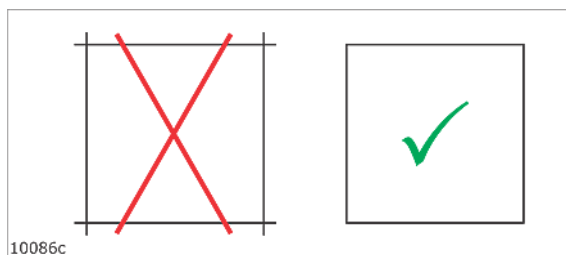
D - X/Y moving direction

Layer Setup for RotaCut

Correct setting of **Lag**- and **Width** - values are shown.

Lag: 3.5 mm / 0.14 inch

Width: 7.0 mm / 0.28 inch



Use the **Lag** and **Width** parameters to achieve proper corner cutting.

12.17 Braille Tool

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.

Note: It is crucial that the **Tool Height** is correctly set before running this tool.

The nominal value is **Tool Height = Material Thickness**.


Meaning, if the material is 6 mm thick, the nominal height setting should be -6 mm (minus 6 mm).

Tool Offset adjustment



Machine Connection->Tool Configuration

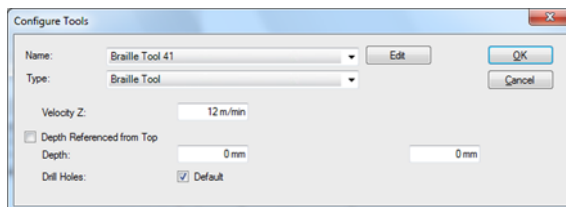
1	Load the Braille Tool with black spheres.
2	Cut a piece of double sided tape measuring approximately 20x20 mm / 0.8x0.8 in. and stick it to the surface of the working area. Preferably the milling underlay or your selected substrate. It is important that the piece of tape fits within the hole in the measuring foot with good margins.
3	Insert the Braille Tool in the MultiCUT tool head.
4	Open up the Tool Adjustment dialog.
5	Select 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 Spot is offset from the sphere, jog the tool head until the Laser Spot is placed exactly on top of the sphere.
10	Click Finish and close the remaining tool adjustment dialogs.

Configure Tool



Menu Bar->Advanced->Configure Tools...



Braille Tool should be defined with the following parameters enabled:

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

Preparing Layers for Braille Tool



Opened Job->Layers->Edit 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

The 'Edit Layer' dialog box for 'Braille drilling' shows the following settings:

- Name: Braille drilling
- Tool: HS_Milling 0
- Registration Type: From Production Manager
- Velocity X/Y: 1.00 m/min
- Velocity Z: 1.00 m/min
- Acceleration: 100
- Z-axis Depth X: -1.93
- Z-axis Depth Y: -1.93
- Spindle RPM: 20000
- Tool Offset: Outside
- Tool Diameter: 6.000 mm
- Direction: Counter Clockw
- Wash Out Small Curves: ☐
- Threshold: 0.000 mm
- Multi-pass Depth: 0.000 mm
- Finishing Pass Offset: 0.000 mm
- Material Thickness: 0.000 mm
- Web Thickness: 0.000 mm
- Drill Holes: ☒

Velocity Z

Velocity Z is material dependent and may require experimentation.

The value shown in the illustration 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 are suitable for 3mm Dibond.

Drill holes

Drill holes check box should be enabled.

Layer: Braille Tool

The 'Edit Layer' dialog box for 'Braille pen' shows the following settings:

- Name: Braille pen
- Tool: Braille Tool 68
- Registration Type: From Production Manager
- Velocity X/Y: 79.98 m/min
- Velocity Z: 9.96 m/min
- Z-axis Depth X: -3
- Z-axis Depth Y: -3
- Drill Holes: ☒

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.

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.

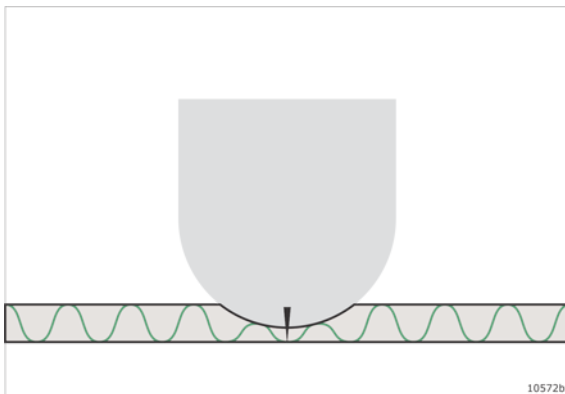
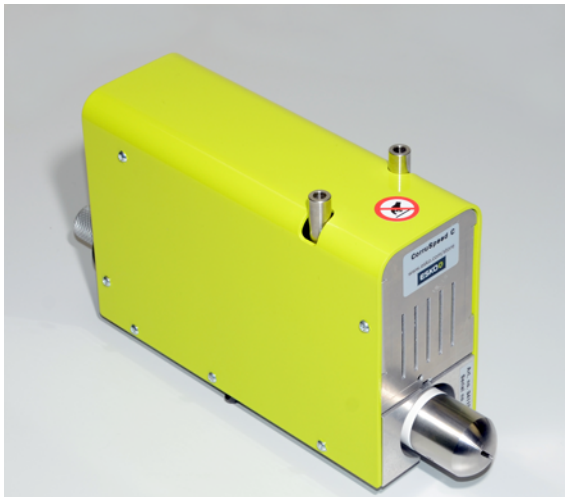
As with other fonts, outlines of the text need to be created before creating the output file for i-cut Vision.

Since the Braille patterns should be drilled with the milling spindle as well as Braille spheres being inserted with the **Braille Tool**, it is recommended to duplicate the Braille **Layer**.

Keep other graphics than Braille in separate layers.

12.18 CorruSpeed Knife

Note: iPC version 2.0 or higher is required to run this tool.



CorruSpeed Knife tool is made especially for cutting corrugated materials.

Maximum material thickness: 7 mm/0.28 in.

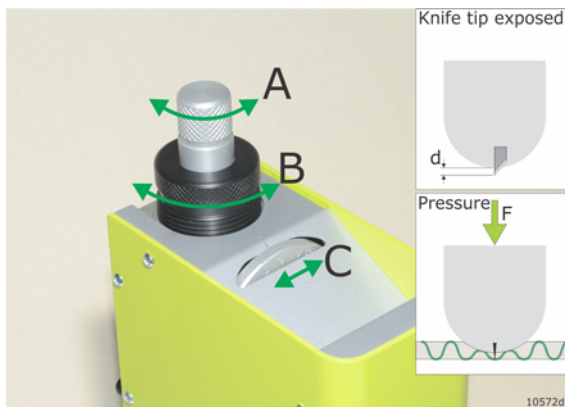
Maximum knife edge height: 6.5 mm/0.26 in; requires minimum 0.5 mm/0.02 in. crush.

During processing, the corrugated material is partly crushed by the foot.

The result is:

- You can run at high speed.
- The risk for material tear is significantly reduced.

Foot pressure adjustment



Material crushing depends upon two adjustments:

A - Knife tip exposed

Adjust until the distance d is 1.0 mm/0.04 in. less than material thickness.

One turn (CW) on A increase d with 1 mm/0.04 in.

B - Foot pressure

Adjust foot pressure.

C - scale indicating actual pressure.

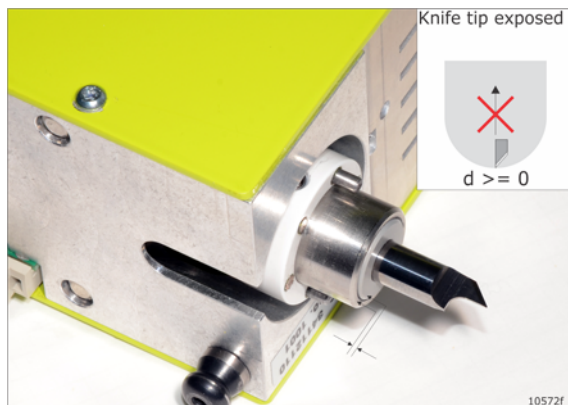
For optimal performance, the foot pressure must be adapted to each material.

Run some test cuts to find the best combination of knife tip exposure and foot pressure.

Start with foot pressure = 5 and test with different knife tip exposures.

By this, you can find and save settings that are optimal for each type of material.

Note

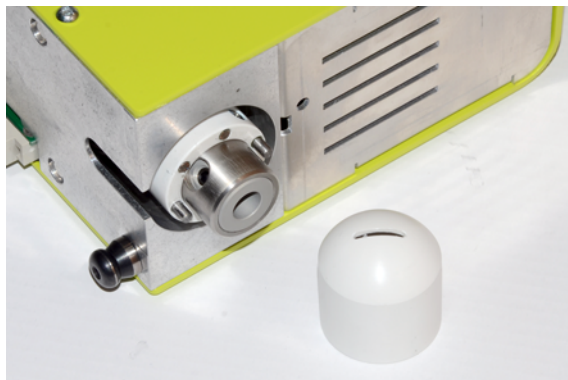


When adjusting the knife tip exposure, do not adjust the knife tip too far into the foot.

The limit is when the knife tip is flush with the front edge of the foot,

or the inner sleeve is flush with the outer sleeve.

Insert Knife Blade



For **Knife Blade** change, remove the foot.

- The locking screw will always point towards the cutting direction
- Note: Be extremely careful when mounting the foot.
- Observe the alignment pins.
- After a blade change, the tool depth should be checked again.

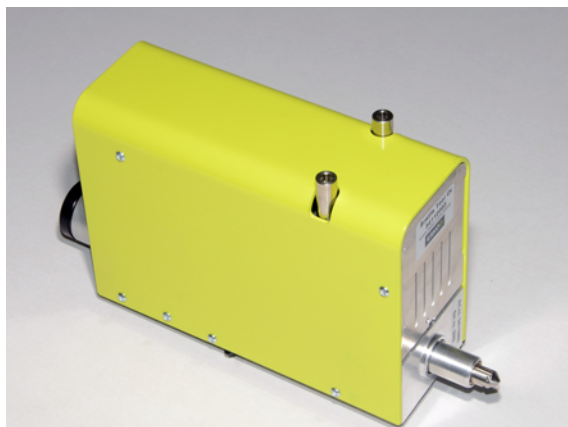
12.18.1 Tool adjustment

For this tool, complete the following adjustments:

Parameter	Description
Lag Setting	The knife lag depends upon the blade shape. Normal value is 0 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 [Tool Configuration](#).

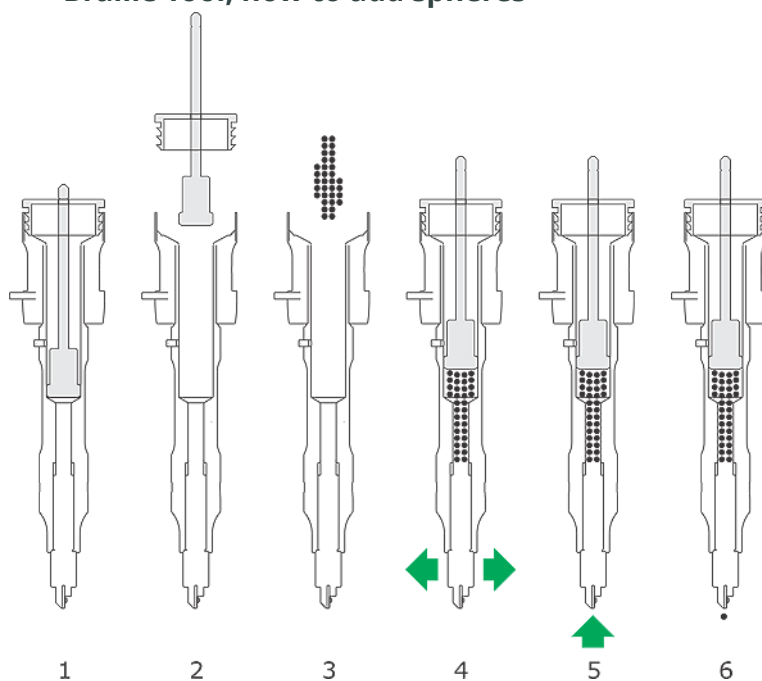
12.19 Braille Tool



Braille Tool will enable you to create signage readable by visually impaired people.

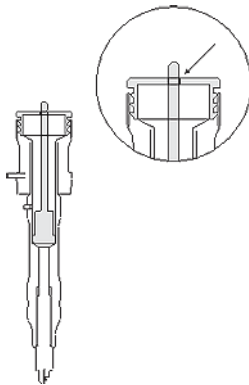
Braille Tool is prepared for use in combination with **HPMU**.

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**.

Note: It is crucial that the **Tool Height** is correctly set before running this tool.

The nominal value is **Tool Height = Material Thickness**.

Meaning, if the material is 6 mm thick, the nominal height setting should be -6 mm (minus 6 mm).


Tool Offset adjustment



Machine Connection->Tool Configuration

1

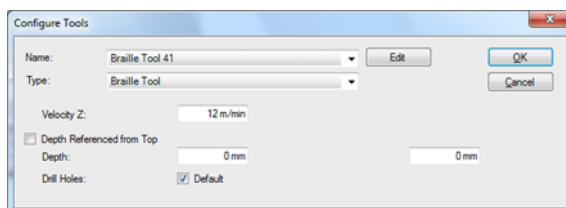
Load the **Braille Tool** with black spheres.

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 HPMU tool head.
4	Open up the Tool Adjustment dialog.
5	Select 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 Spot is offset from the sphere, jog the tool head until the Laser Spot is placed exactly on top of the sphere.
10	Click Finish and close the remaining tool adjustment dialogs.

Configure Tool



Menu Bar->Advanced->Configure Tools...



Braille Tool should be defined with the following parameters enabled:

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

Preparing Layers for Braille Tool



Opened Job->Layers->Edit 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 (HPMU)

The 'Edit Layer' dialog box for 'Braille drilling' shows the following settings:

- Name: Braille drilling
- Tool: HS_Milling 0
- Registration Type: From Production Manager
- Velocity X/Y: 1.00 m/min
- Velocity Z: 1.00 m/min
- Acceleration: 100
- Z-axis Depth X: -1.93
- Z-axis Depth Y: -1.93
- Spindle RPM: 20000
- Tool Offset: Outside
- Tool Diameter: 6.000 mm
- Direction: Counter Clockw
- Wash Out Small Curves: ☐
- Threshold: 0.000 mm
- Multi-pass Depth: 0.000 mm
- Finishing Pass Offset: 0.000 mm
- Material Thickness: 0.000 mm
- Web Thickness: 0.000 mm
- Drill Holes: ☒

Velocity Z

Velocity Z is material dependent and may require experimentation.

The value shown in the illustration 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 are suitable for 3mm Dibond.

Drill holes

Drill holes check box should be enabled.

Layer: Braille Tool

The 'Edit Layer' dialog box for 'Braille pen' shows the following settings:

- Name: Braille pen
- Tool: Braille Tool 68
- Registration Type: From Production Manager
- Velocity X/Y: 79.98 m/min
- Velocity Z: 9.96 m/min
- Z-axis Depth X: -3
- Z-axis Depth Y: -3
- Drill Holes: ☒

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.

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 **HPMU** spindle as well as Braille spheres being inserted with the **Braille Tool**, it is recommended to duplicate the Braille **Layer**.

Keep other graphics than Braille in separate layers.

12.20 Drill / Pen Tool

Tool Insert Position

If included, the **Tool Insert Position** is permanently mounted on the P1 - tool position.

The holder is prepared for **Ballpoint Pen**, **Drill Tool** or **Ink Tool**.

Note: Tools for the **Tool Insert Position** can not be used in combination with HDU (Heavy Duty Unit), Foam Knife and HPMU (High Power Milling Unit).

How to insert / remove a drill / pen tool



Inserting a tool - push down until the **Tool** is locked in position.



To remove a **Tool** - press the **Release Button**.



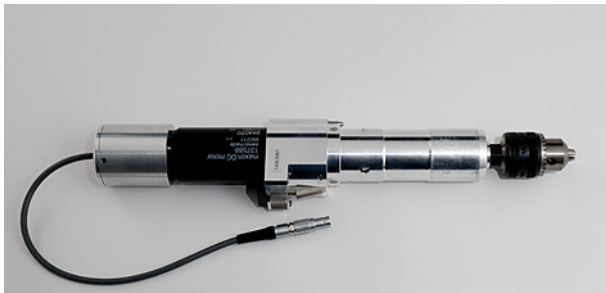
Pen/Drill Motor Connector:

To release, grab the housing and lift straight up.

To insert, move connector carefully down and turn it until it fits.

Then just push the connector down until it is locked in position.

12.21 Drill Tool



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).

How to replace a Drill Bit



Push the **Drill Bit** towards the bottom of the chuck.

Use the wrench to fix the bit in the chuck.

No additional adjustments are necessary, as the tool height is measured automatically.

Tool Adjustment

For this **Tool**, complete the following adjustments:

Adjustment	Description
Tool Height	Measured automatically, possible to add an Offset Value .
Tool Offset	Adjust offset relative to Laser Pointer .

For more information about how to run the **Adjustment Wizards**, see the [Tool Configuration](#) chapter

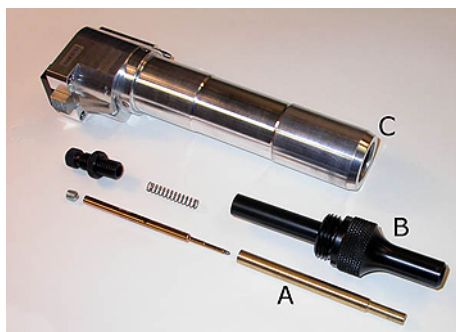
12.22 Ballpoint Pen



Ballpoint Pen is available for pen drawing.

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

Tool Assembly and Pressure Adjustment



A - Inner sleeve.

The **Ballpoint Pen** refill is fixed inside the sleeve using a screw.

Use **Allen Key**, 3 mm.

B - Sleeve holder with spring and **Pressure Adjustment Knob**.

C - pen tool

Adjust Tool Pressure using the screw s.

Lock the adjustment screw using the locking knob k.



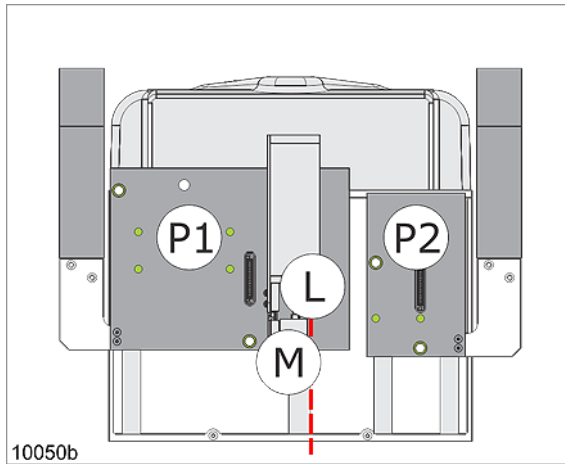
Tool Adjustment

For this tool, complete the following adjustments:

Adjustment	Description
Tool Height	Measured automatically, possible to add an offset value.
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

12.23 Measuring Foot



The **Measuring Foot (M)** has 3 functions:

1. Measure the thickness of the material on the table
2. **Map Table Top Surface.**
3. Calibration of the **Measuring Station**. No adjustments are necessary.

12.24 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 **Operator Panel** will switch the **Laser Pointer** on again.

13. Maintenance

13.1 General

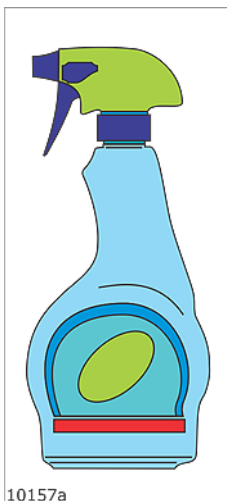


Warning

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

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

13.2 Daily Maintenance



Inspect

- Inspect the equipment in order to prevent any irregularities.

Clean

- The **Table Surface** should be kept clean at all times. For cleaning, use iso-propyl alcohol or white-spirit.
- The room should be cleaned regularly. Keep the cables free from grease, floor vax etc.
- Use a **Vacuum Cleaner** to keep the inside of the **Conveyor belt** clean.

13.3 Weekly Maintenance

Guide-ways and Bearings

The guide-ways and the bearings should be thoroughly cleaned and oiled very lightly with Tellus R10 oil.

Photo Cells

The surface of the **Transmitter** and **Receiver** should be carefully cleaned using light soap and clean water.

Air Pressure Reduction Valve

The automatic draining action of the **Air Pressure Reduction Valve** should be controlled:

1. Switch off the **Air Compressor** and allow the air pressure to fall.
2. 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.
3. 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.

Warning

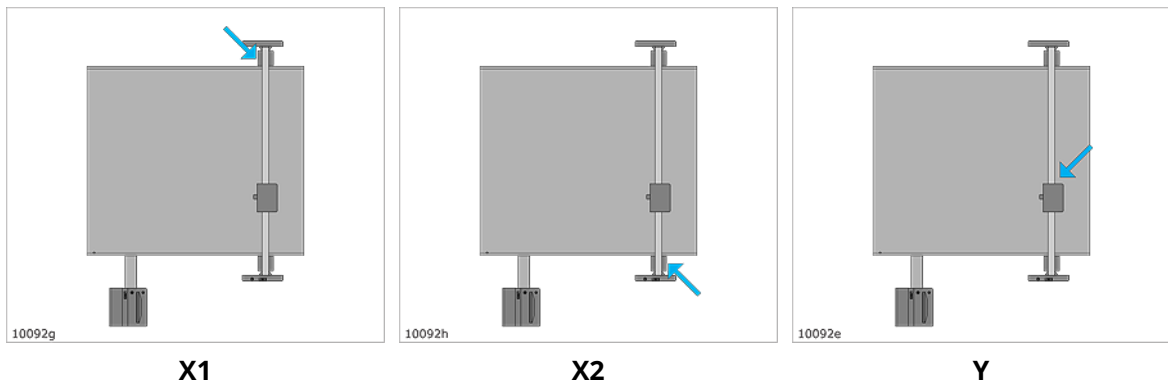
If the automatic draining action fails, water can enter the **Tool Assembly** resulting in severe damage.

13.4 Monthly Maintenance

Monthly Maintenance includes:

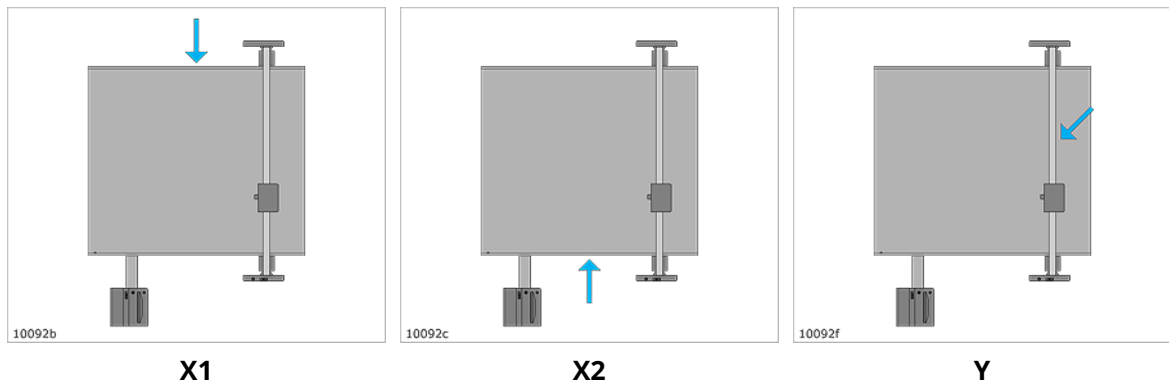
Gears

The **Gears** in X1, X2 and Y should be re-greased using the **Grease Gun**:



Racks

The **Racks** in X1, X2 and Y should be re-greased:



Vacuum Table

Every other month, or after the table surface has been cleaned, the closed vacuum holes in the surface should be opened in order to retain the hold-down efficiency.

Use a steel pin, 0.5 - 0.6 mm.

With the **Vacuum System** switched on, free the vacuum holes by pushing the obstructions down into the table.

13.5 Maintenance, External Equipment

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

14. Fuse Replacement



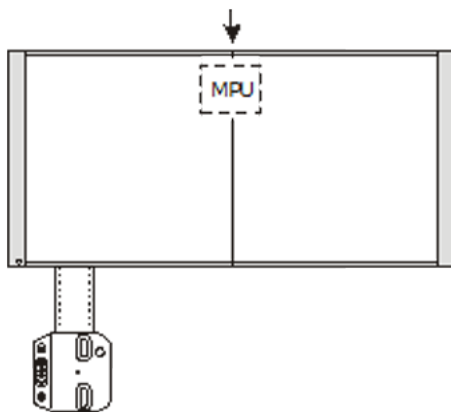
Before starting the Fuse Replacement procedure:

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

Note: Some of the equipment described here is optional.

14.1 MPU fuses

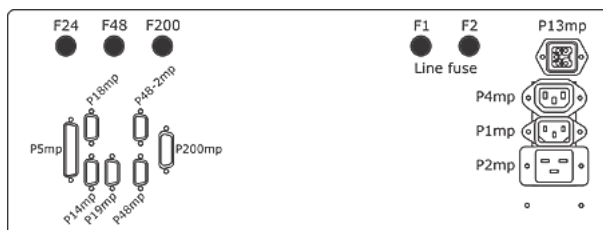
MPU Location



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 base cover in front of MPU
2. Remove one fuse and check with ohm-meter. If blown, replace with a new identical fuse.

3. Repeat for each fuse.
4. Replace base cover
5. Insert main power cable into the wall socket and turn main power on.

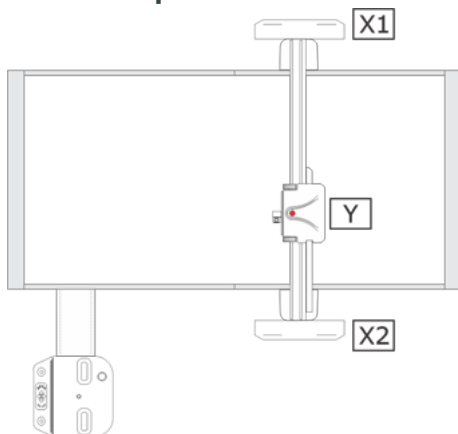
Fuse Details

All fuses are: 1 1/4 x 1/4 in (6,3 x 32 mm)

Fuse location	115V	230V
Line fuses F1 and F2	T 15A 250V	T 6,25A 250V
200V Servo power fuse F200	T 15A 250V	T 15A 250V
48V Servo power fuse F48	T 8A 250V	T 8A 250V
+24V fuse F4	T 6.25A 250V	T 6.25A 250V

14.2 X1

X1 Amplifier Location

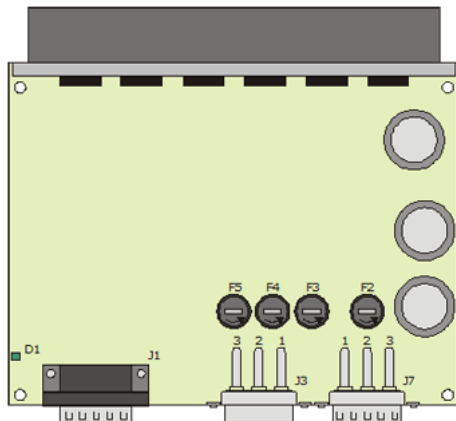


Fuse Location



1 – 8/24A AC amplifier X1

2 – SCU unit



Procedure

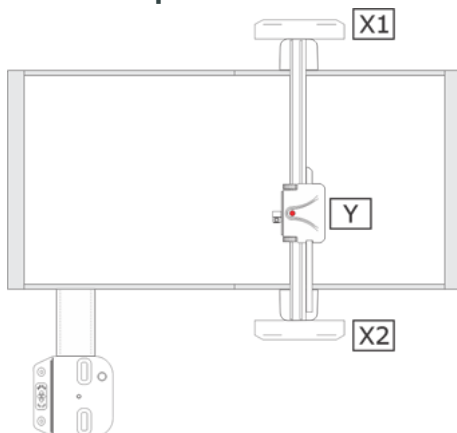
1. Remove X1 cover.
2. Remove cover from AC amplifier unit.
3. Check fuses F2 – F5 with ohm - meter. If blown, replace with a new identical fuse.
4. Replace covers.
5. Insert main power cable into the wall socket and turn main power ON.

Fuse Details

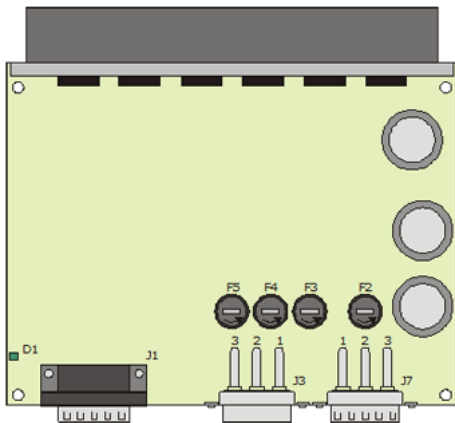
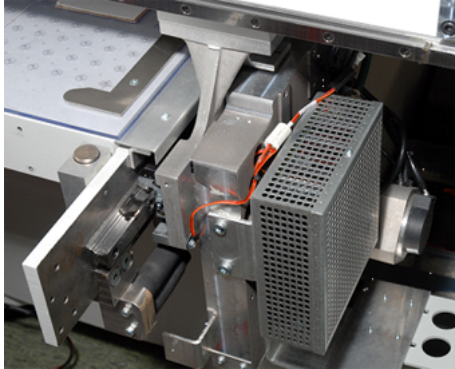
T 10A 250V (5 X 20 mm).

14.3 X2

X2 Amplifier Location



Fuse Location



Procedure

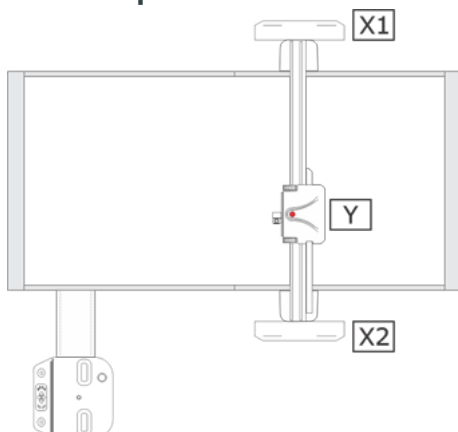
1. Remove X2 cover.
2. Remove cover from AC amplifier unit.
3. Check fuses F2 – F5 with ohm - meter. If blown, replace with a new identical fuse.
4. Replace covers.
5. Insert main power cable into the wall socket and turn main power ON.

Fuse Details

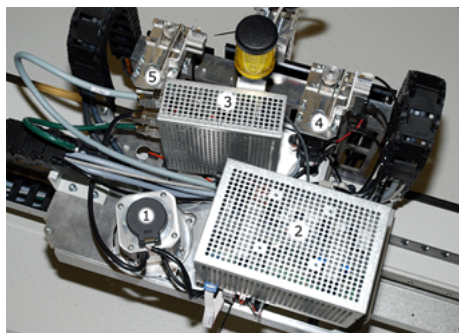
T 10A 250V (5 X 20 mm).

14.4 Y

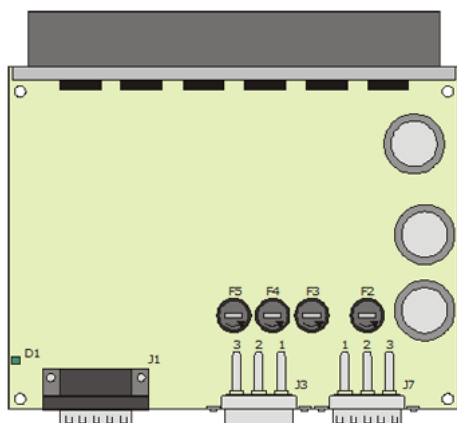
Y Amplifier Location



Fuse Location



- 1 - Y-motor with encoder.
- 2 - TCU.
- 3 - AC amplifier for Y.
- 4 - Z1 - motor.
- 5 - Z2 - motor



Procedure

1. Remove Y cover.

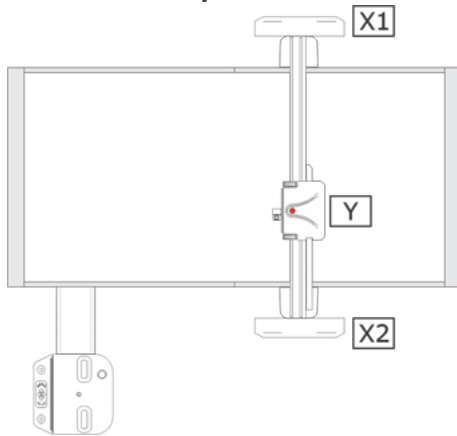
2. Remove cover from AC amplifier unit.
3. Check fuses F2 – F5 with ohm - meter. If blown, replace with a new identical fuse.
4. Replace covers.
5. Insert main power cable into the wall socket and turn main power ON.

Fuse Details

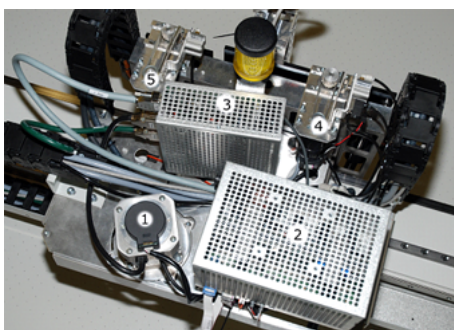
T 10A 250V (5 X 20 mm).

14.5 P1/P2 fuses

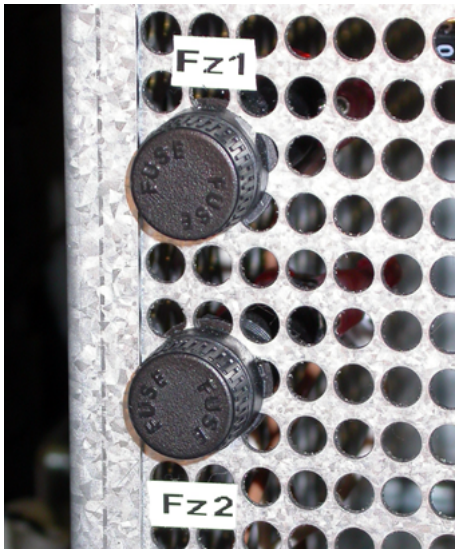
P1/P2 Amplifier Location



Fuse Location



- 1 – Y-motor with encoder.
- 2 – TCU.
- 3 – AC amplifier for Y.
- 4 – P1 – motor.
- 5 – P2 – motor



Procedure

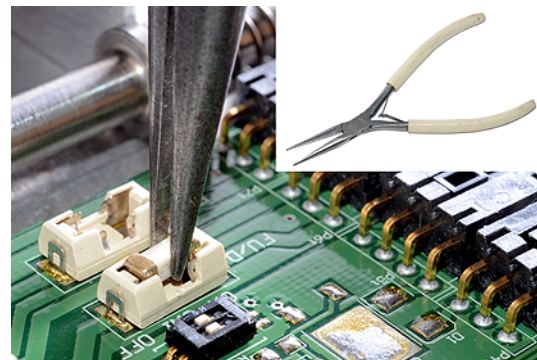
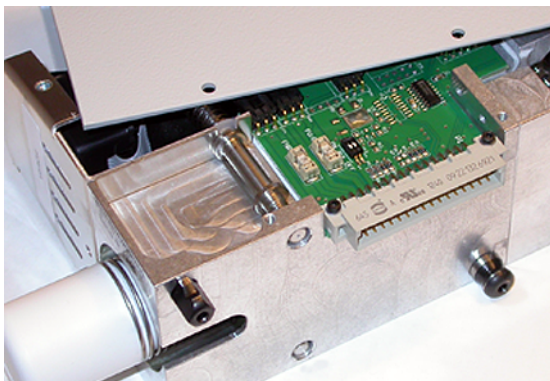
1. Remove Y cover.
2. On the TCU - unit, check fuses Fz1 and Fz2 with ohm - meter. If blown, replace with a new identical fuse.
3. Replace covers.
4. Insert main power cable into the wall socket and turn main power ON.

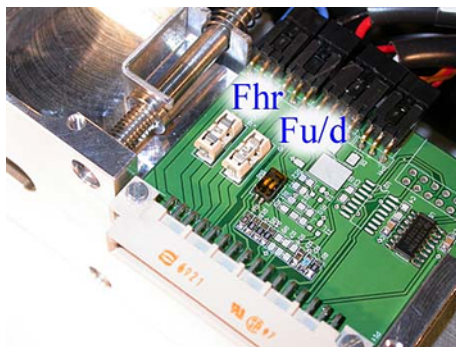
Fuse Details

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

14.6 Tool Rotation/Reciprocating Knife

Tool Board location



**Fuse location:**

Fhr - Tool rotation fuse.

Fu/d - Tool up/down or tool reciprocation fuse.

Procedure:

1. Fuses are available on the Tool Board inside the actual tool.
2. Remove the plastic cover on the tool.
3. Remove fuse Fhr or Fu/d as illustrated above (lift straight up).
4. Check with ohm - meter. If blown, replace with a new identical fuse.
5. Insert main power cable into the wall socket and turn main power ON
6. For information about fuse sizes, see table below.

Fuse Details

Tool Head	Function	Fuse	Fuse Size	Fuse Type
Drill Tool	Drill	Fhr	2	T 2A 125V NANO (42441618)
Hiforce Knife Tool	Tool Rotation	Fhr	2	T 2A 125V NANO (42441618)
HF VibraCut Knife Tool	Tool Rotation	Fhr	2	T 2A 125V NANO (42441618)
HF VibraCut Knife Tool	Vibration	Fu/d	4	T 4A 125V NANO (42444828)
Presscut Knife Tool	Tool Rotation	Fhr	2	T 2A 125V NANO (42441618)
Presscut Knife Tool	Tool u/d	Fu/d	0.75	T 0,75A 125V NANO (42442541)
RM Knife Tool	Tool Rotation	Fhr	4	T 4A 125V NANO (42444828)
RotaCut	Knife RPM		2	T 2A 125V NANO (42441618)
VariCut Knife Tool	Tool Rotation	Fhr	2	T 2A 125V NANO (42441618)
VariCut Knife Tool	Knife Depth	Fu/d	0.5	T 0,5A 125V NANO (42441600)
VibraCut Knife Tool	Tool Rotation	Fhr	2	T 2A 125V NANO (42441618)
VibraCut Knife Tool	Vibration	Fu/d	2	T 2A 125V NANO (42441618)
H DU (XP)	Tool Rotation	Fhr	4	T 4A 125V NANO (42444828)

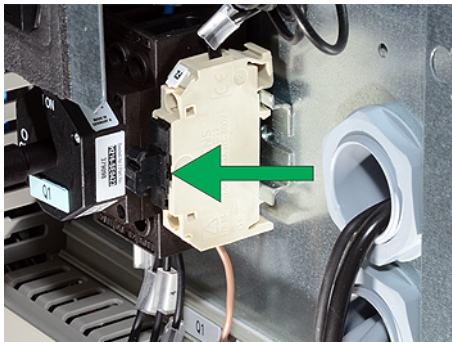
14.7 Chiller1 fuse



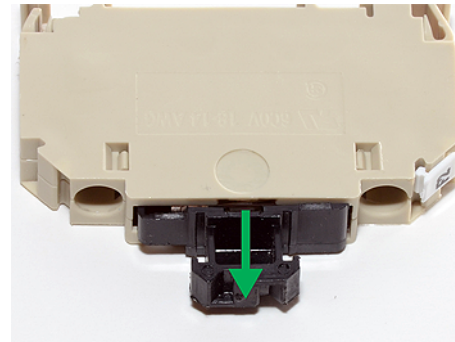
Remove the on/off button



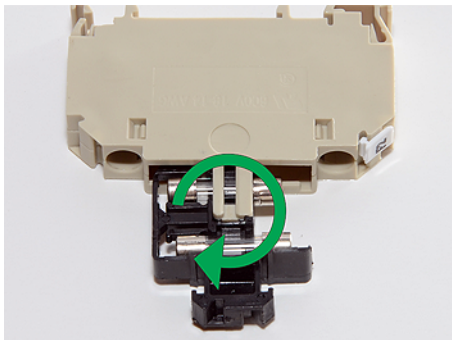
Remove cover (4 screws)



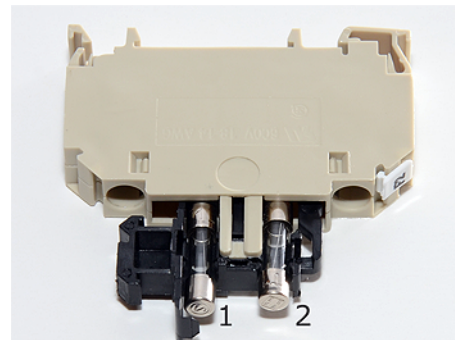
Fuse location



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:

115V: T 2A 250V (5x20 mm)

230V: T 1A 250V (5x20 mm)

14.8 Heater for Chiller Fuse

Heater Fuse Location

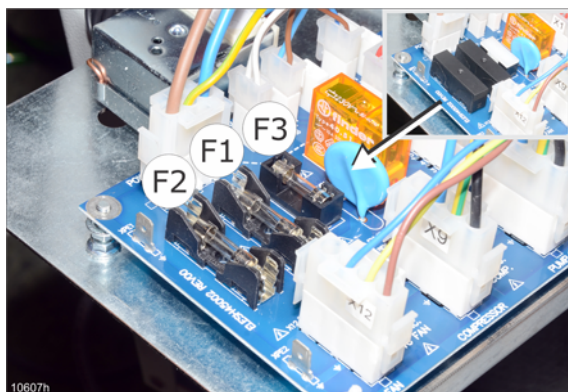


The **Fuse** is available inside the connector cover.

Fuse details

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

14.9 Chiller2016 Fuse replacement



Fuses are located on the PCB inside the Chiller unit.

Each fuse is protected by a cover as shown upper right.

Lift straight up to remove.

Fuses when 115 V:

F1 - T 16A 250V (5 X 20 mm) (42468066)

F2 - T 16A 250V (5 X 20 mm) (42468066)

F3 - T 500 mA 250V (5 X 20 mm) (42468074)

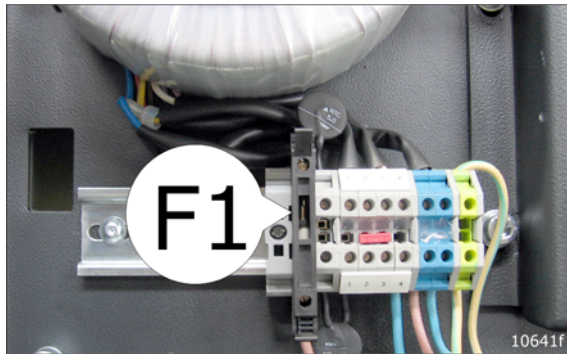
Fuses when 230 V:

F1 - T 12A 250V (5 X 20 mm) (42468082)

F2 - T 12A 250V (5 X 20 mm) (42468082)

F3 - T 500 mA 250V (5 X 20 mm) (42468074)

14.10 TakeUp Unit, Fuse replacement

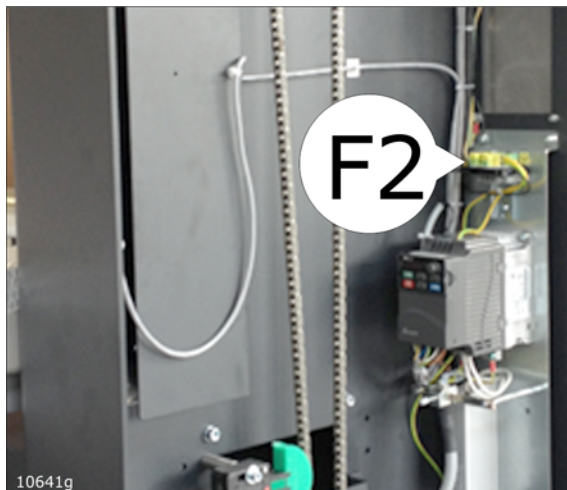


The fuses are mounted on the main electrical mounting plate behind the sheet metal cover on the right side of the machine.

Fuse F1:

T10 A, 250V, 5x20mm (42448985)

The same fuse size is used regardless 115V/230V.

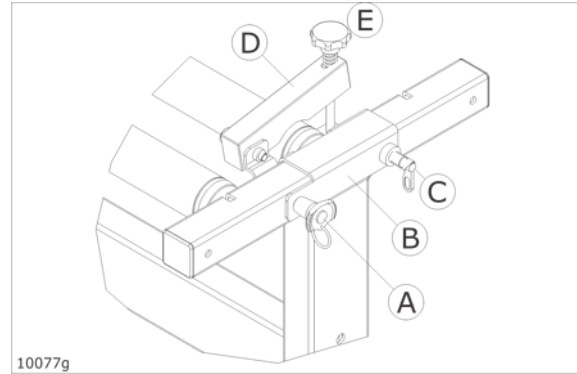
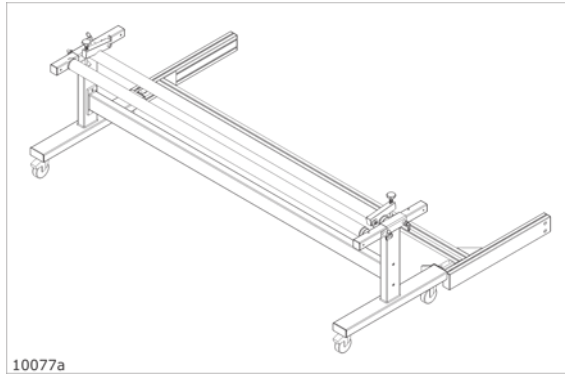


Fuse F2:

T2.5 A, 250V, 5x20mm (44347540)

The same fuse size is used regardless 115V/230V.

15. Roll Feeder



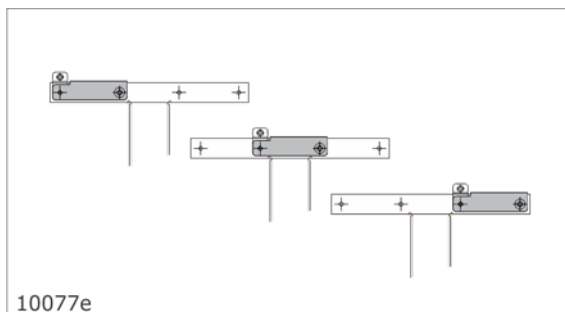
A – **Bracket Position Pin** (push the center button to release the lock).

B – **Roll Holder Bracket**.

C – **Brake Position Locker**.

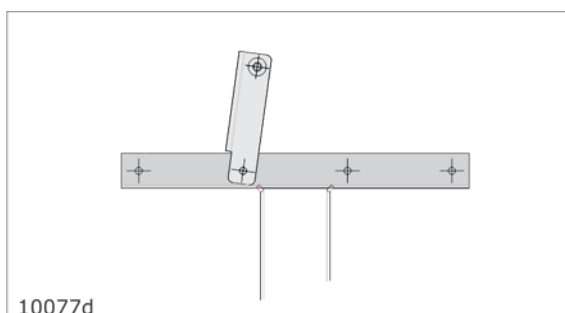
D – **Roller Brake**.

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



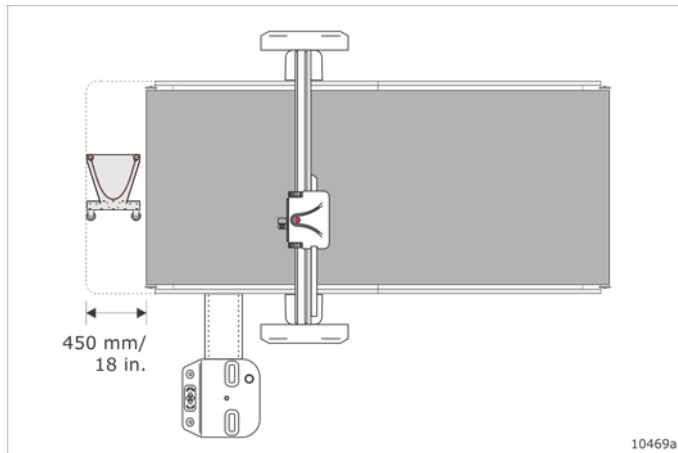
To adapt to different roll sizes, three **Roll Holder Positions** are prepared.

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.

16. Collector Basket



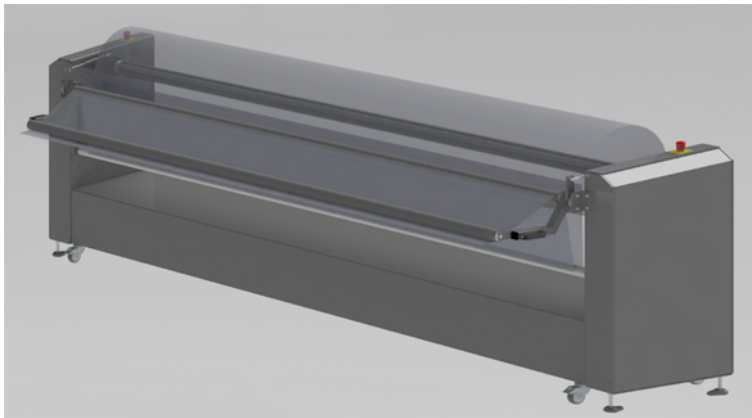
The unit is placed in the unload end of the conveyor belt (front of table).

The unit is prepared for rigid pieces up till 200x200 mm / 8x8 in, or flexible materials.

Maximum load weight is 30 kg / 65 lbs.

17. TakeUp Unit

17.1 Introduction



Scope

This manual refers to the **TakeUp Unit**

The manual contains useful and important information for proper functioning and maintenance of the machine.

It also contains important instructions to prevent accidents and serious damage prior to and during operation of the machine, and it enables the product to perform as safely and flawlessly as possible.

- Read this manual carefully before starting the machine.
- Familiarize yourself thoroughly with the functioning of the machine
- Strictly observe the directions given.

Liability

The data published in this manual are based on the latest information available.

They are subject to future modification.

We reserve the right to change the construction and/or design of our product, without being obliged to adapt earlier supplies accordingly.

Warranty

The warranty conditions stated in our terms of delivery, which are in your possession, are applicable to this product.

The warranty on your equipment become null and void if:

- Service and maintenance are not carried out strictly in accordance with the instructions, repair work is not carried out by our personnel or has been performed without prior written consent.
- The **TakeUp Unit** is modified without prior written consent; non-original parts are used.
- The equipment is used inexpertly, incorrectly, carelessly or not accordance with its nature or intended use.

Wearing parts are not covered by the warranty

Safety

Familiarize yourself with the pictograms.

The equipment is provided with safety and protection features.

Even so, caution is necessary when performing machine operations.

Warning pictograms in the various sections point to potential dangers. You will find these pictograms near the text referring to the operations risks.

Work safely!

We have made every effort to inform you as correctly and completely as possible on any dangers associated with the operation of the machine.

You must ensure and are responsible for compliance with these behavioural guidelines.

The buyer/user is obliged to familiarize operating, cleaning and maintenance personnel with these instructions .

17.2 Machine Description

The **TakeUp Unit** is a machine specially developed to take-up media, with minimum pull on the media.

Frame

The frame of the **TakeUp Unit** consists out of two metal frame plates which are connected to each other by a folded plate.

The main electrical components are mounted on the left frame plate.

The left and right side of the **TakeUp Unit** are protected with metal cover plates which are mounted to the frame plates. Other machine sub-assemblies are mounted in between the both metal frame plates

Operation

There is one switch on the left top-side of the **TakeUp Unit**.

This switch switches the machine on and off.

The emergency stop on the top of both sides of the **TakeUp Unit** can be used to stop the machine immediately.

The dancer roller controls the turning direction of the **TakeUp Unit**.

When there is new media provided to the **TakeUp Unit** by for example a cutting table, the dancer roller will follow the media and lowers in the machine.

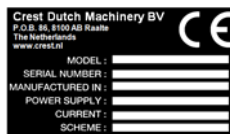
When the dancer roller lowers in the **TakeUp Unit**, the machine will start winding the material till the dancer roller rises to his neutral zone.

Winding shaft

The **TakeUp Unit** is equipped with a Autogrip shaft, which is driven on the left side of the machine.

This autogrip shaft has a variable winding speed depending on the height of the dancer roller.

Machine Identification



The **TakeUp Unit** has an identification label, a typical label is shown in the picture.

The identification label is positioned on the left side of the machine, where the power cable is entering the machine.

17.3 Safety

General

The **TakeUp Unit** has safety equipment to promote safe machine operation, see next chapter.

You must, however, take note of the following:



Make sure that clothing, long hair etc. are not caught by rotating rollers, which would involve the risk of being trapped.

Emergency stop button:

The **Emergency Stop** buttons are positioned on top of the safety covers at the **TakeUp Unit**.

Press the **Emergency Stop** button to stop all rotating parts at once.

Pictograms

	<p>DANGER: VOLTAGE</p> <p>Only qualified personell is authorised to open these parts of the machine to perform maintenance operations.</p> <p>In this case, ensure that the power is turned off.</p>
	<p>Do <u>not</u> remove or open the left metal safety covers of the machine, you may get injured by voltage or rotating parts.</p> <p>Open or remove the covers only to carry out maintenance. In this case, ensure that the machine is powered down.</p> <p>Do not place heavy objects on the power supply cord.</p> <p>Do not place objects on the covers.</p> <p>The machine has two emergency stop buttons which may be pressed in dangerous situations.</p> <p>Pressing one of the emergency stop buttons will immediately result in halting of the moving and rotating parts.</p>

Obligations of the Owner

The owner of the machine has to make sure that the only people allowed to work with and on the machine have understood the basic rules on workplace safety and accident prevention.

The owner will make sure that the personnel is trained in the handling of the machine and have been familiarized with the operating and safety instructions contained within this manual.

The safety awareness of personnel shall be reviewed at regular intervals.

Obligations of the Personnel

All individuals working with and on the machine commit to be familiar with the basic regulations on industrial safety and accident prevention and the section on safety contained within this manual.

Dangers caused by Operation of the Machine

The **TakeUp Unit** is built according to accepted engineering standards and safety regulations.

Despite that, operating the machine could result in danger for life and limb of the operator or cause damage to the equipment or other property.

The machine shall be used only:

- For the intended use.
- In absolutely perfect condition.

Malfunctions or damage that may affect the safety must be serviced immediately.

Intended Use

The **TakeUp Unit** is only intended to be used for winding up media.

Any different or additional use of the machine is considered improper and Esko is not responsible for any resulting damage to machine or individuals.

Intended use does include:

- Following all instructions in this manual.
- Carrying out inspection and maintenance operations.

Safety Features

- Before start-up of the machine, make sure that all safety features are properly installed and operational.
- Safety covers may only be removed and replaced when the machine is at a complete stop and powered down.

Informal Safety Measures

- The user manual must be kept with the machine.
- In addition to the operating instruction, the local accident prevention regulations and environmental regulations should be available.
- All safety instructions and warning pictograms must remain in legible condition.

Security Measures for Normal Operation

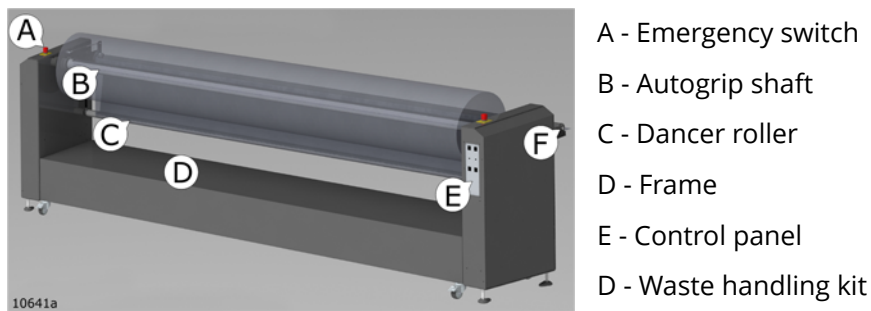
- Only operate the machine if all safety features are fully functional.
- Before start-up of the machine, ensure that no other individuals are to be at risk.
- Check the machine for obvious damage and the safety features being functional at least once every shift.
- Only operate the machine if all gauges and warning lights are fully functional.

Dangers Caused by Electricity

Maintenance on the electrical system should only be carried out by qualified mechanics

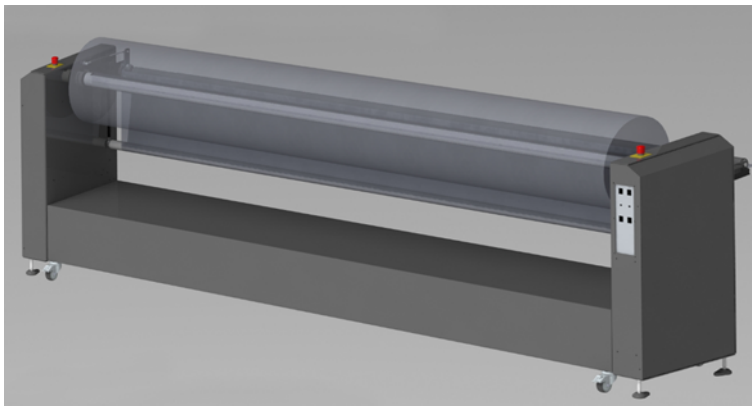
17.4 Features and components

Components overview



17.5 General operation

Control positions



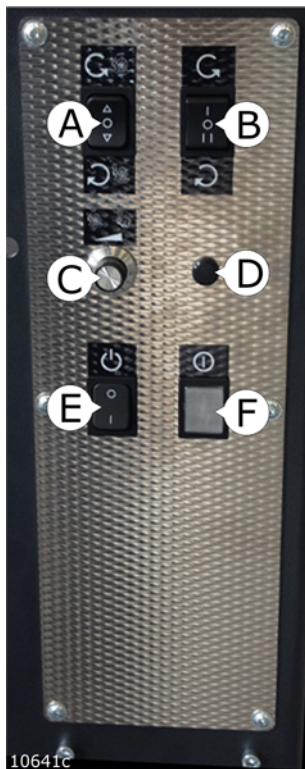
The **TakeUp Unit** is normally operated from the right side of the machine.

Controls

At the left side of the frame are the operating switches.

These switches allow the operator to control the power (on or off), the turning direction, the winding speed and the possibility to jog the machine.

The different controls are shown in picture:

**A - Jog forward/backward**

The jog button turns the autogrip shaft slowly forwards or backwards.

To Jog, the winding direction button has to be set in position: 0.

B - Winding direction

The winding direction button controls the winding direction of the **TakeUp Unit**.

C - Winding speed

The winding speed potentiometer controls the winding speed.

D - Spare**E - Power button**

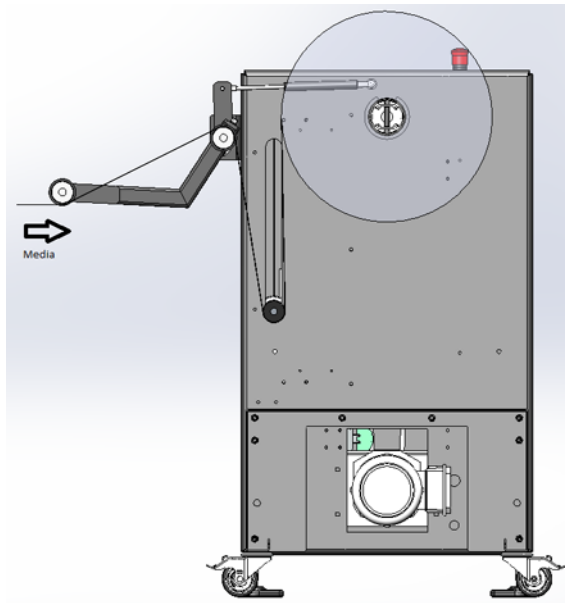
The power button switches the machine on or off.

F - Control lamp

The control lamp indicates if the machine is turned on or off.

17.6 Applying Winding Material

Applying winding material to the Autogrip shaft



Add a 3 in. coil on the Autogrip shaft.

Bring the material with the Kongsberg table to the **TakeUp Unit** till the material is fed far enough underneath the waste handling kit to reach the Autogrip shaft.

Take the winding material underneath the dancer roller and paste it with tape in a straight line onto the coil.

See picture for the typical loop of the winding media.

Avoid angular tension in the media; the media will start telescoping during the winding.

Note: **TakeUp Unit** should be started only when material is in place.

Infeed loop





Aligning the media on the Autogrip shaft

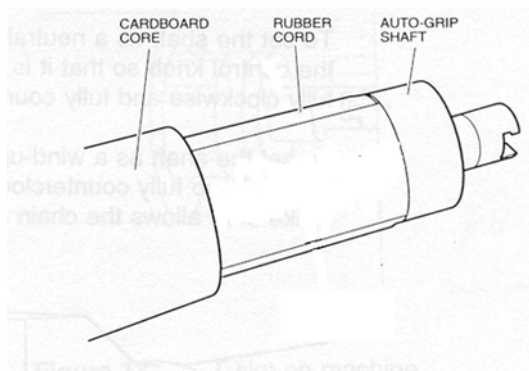
17.7 Start the TakeUp Unit

The **TakeUp Unit** is activated for processing when:

- The power button is switched on.
- The **Emergency Stop** button is pulled up (in de-activated position).

	<p>The TakeUp Unit is activated.</p> <p>The machine starts processing.</p> <p>It stops when the dancer roller is in neutral position, the power button is switched off or when the emergency stop is activated.</p>
	<p>Attention:</p> <p>The TakeUp Unit does not stop automatically when the waste roll is full.</p> <p>This has to be done manually by switching off the power button or by activating the emergency stop button.</p>

17.8 Using the Autogrip Shaft

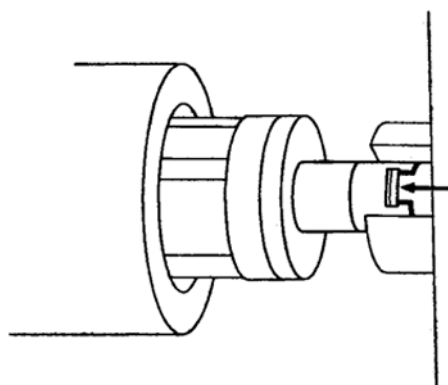


Put the core/media roll central on the autogrip shaft, which uses rubber blocking cords to grip with.

Rotate the core/media roll to engage it with the autogrip-shaft.

Note: If a core/media roll of the same size is often used; install a roll clamp at one side of the shaft, to enable easy replacement.

Autogrip shaft installation



T-slot of **TakeUp Unit**

The shaft is hung in a special T-slot on one side of the machine and a suspension point on the other side.

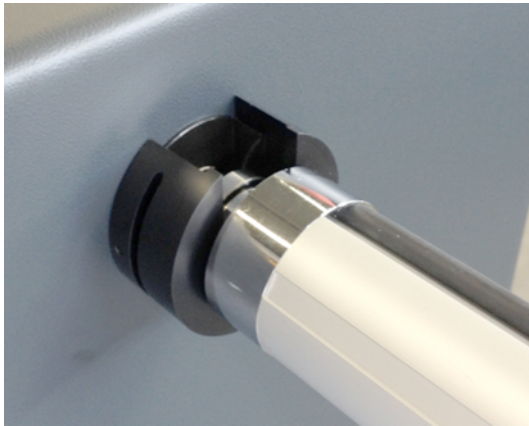
The suspension points on both sides of the **TakeUp Unit** are provided with a locking ring to prevent the Autogrip shaft from falling out.

The locking ring has to be turned manually to locked or unlocked position.



Attention:

During operation, the locking rings need to be in locked position, to ensure safe operation and avoid risks for the operator.



Locking ring in unlocked position



Locking ring in locked position

Exchange media rollers

The media needs to be cut when the media roll has reached it's maximum diameter or when the roll has to be exchanged.

Before cutting the media, the **TakeUp Unit** has to be always switched off.

The tip has to be stuck to the roll to prevent unwinding during transportation.

The **TakeUp Unit** is provided with a jog button to get an easy exchange of the rollers.

This makes is possible to rotate the roller contrary by hand to get the T-slot in position to exchange the media roll.

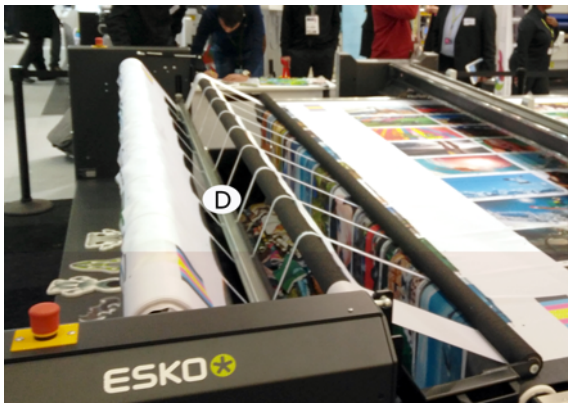


Attention:

When removing the Autogrip shaft.

Always lift the side of the Autogrip shaft near the control panel of the TakeUp Unit first, to avoid damage to the T-slot.

Dancer roller



The dancer roller (D) in the **TakeUp Unit** controls the winding of the media.

When the dancer roller lowers the winding unit will start winding, till the dancer roller rises to the start position.

Resetting TakeUp Unit

The dancer roller will move to its lowest position when a roll of material is completed.

The **TakeUp Unit** will shut-off automatically, when the dancer is longer then 4 seconds in the bottom position.

The full roller can now be replaced by a new, empty core.

The **TakeUp Unit** can be restarted by switching the winding direction to "0", and then back to a winding direction.

The **TakeUp Unit** will now start winding, till the dancer roller rises to the neutral position.

18. Vacuum Cleaner

18.1 Vacuum Cleaner, Zefiro

18.1.1 How to use

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.

Remove Material Container



1



2



3

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

Use Plastic Bag in Material Container



Parts needed: Steel ring and plastic bag



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



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



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.

18.2 Vacuum Cleaner, High-capacity, TB ESKO

18.2.1 How to use

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.

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.

Remove Material Container



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

Use Plastic Bag in Material Container



Shake the filter well before emptying the container.



Plastic Bag with bar ready for container.

Fix the **Plastic Bag** to the steel bar.



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

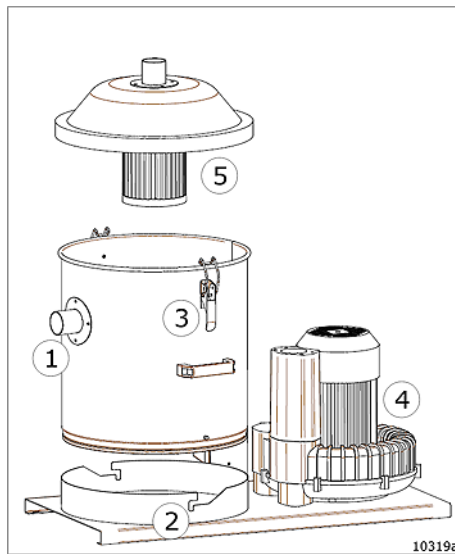
Container with **Plastic Bag** ready for operation.

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

18.3 Compact Vacuum Cleaner

18.3.1 How to use





1. Suction tube inlet
2. Container fixture
3. Filter unit locking mechanism
4. Motor
5. Filter unit

How to empty container

1. Ensure vacuum cleaner motor is off.
2. Remove the suction tube (1).
3. Release the container (3).
4. Remove the filter unit (5).

You should have a bucket nearby for the unit.

5. Lift and turn the container to release it from the fixture.
6. Empty the container.

19. Install Software

For information about software installation, see the **Installation Manual** for the actual machine.

Available on the Documentation DVD.

20. Frequently Asked Questions

20.1 Machine



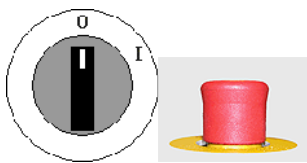
My machine does not react when switching on

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?

20.2 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 **Chuck**. Please fix the **Chuck** 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.

20.3 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