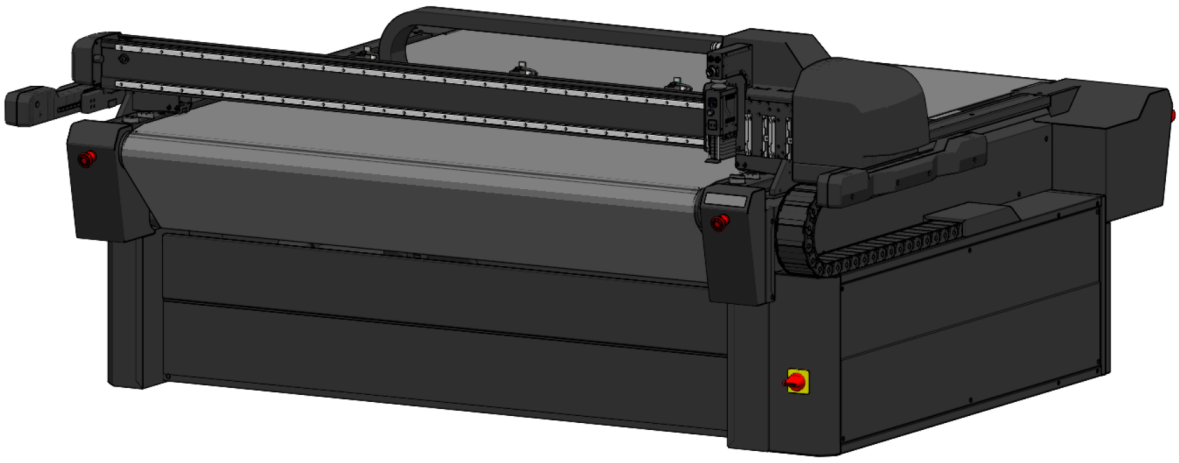
summa

F SERIES™ VANTAGE



Reference Guide

Rev 001

FCC Notice

The F Series tables have been tested and found to comply with the limits for Class A digital devices, in accordance with Part 15 of the FCC Rules. These limits are intended to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

The cutters generate, use, and may emit radio-frequency energy and, if not installed and operated in accordance with this instruction manual, may cause harmful interference to radio communication.

The equipment is not intended for residential environments. When operated in such environments, it may cause harmful interference, for which the user assumes full responsibility.

Caution!

Changes or modifications, not expressly approved by Summa's FCC compliance, could void the user's authority to operate this equipment.

DOC Notice

The F Series complies with the Class A limits for radio noise emissions from digital apparatus, as specified in the Radio Interference Regulations of the Canadian Department of Communications.

Notice

Waste Electrical and Electronic Equipment (WEEE) Directive

The symbol shown on this product indicates that it must not be disposed of with household or municipal waste and must be collected separately.

Electrical and electronic equipment may contain materials that are hazardous to the environment and human health. For this reason, such equipment must be disposed of at an authorized collection or recycling facility, or returned to the retailer to ensure proper treatment and recycling.

If you intend to dispose of this product while it is still functional, please consider reuse options such as donating it to a charity, selling it, or returning it to your retailer for parts reuse or exchange.

Registering the Flatbed Cutter

Please register the Flatbed Cutter on the following link:

https://www.summa.com/support/product-registration/

Failure to register the cutter may result in a delayed response to warranty and service inquiries.

Contact Information

All inquiries, comments or suggestions concerning this and other Summa manuals should be directed to Summa NV.

Summa nv - Rochesterlaan 6 - B-8470 GISTEL – Belgium - Website: www.summa.eu

Revision Overview

Revision	Reason for modification	Publication date	Author
001	Release Reference Guide Vantage	01/07/2026	WP - EJ

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F SERIES™

1 GENERAL

The purpose of this user manual is to describe the operating procedures of the machine and to provide owners, users, and operators with essential safety information for correct and safe operation in accordance with its intended use.

All information contained in this manual must be read and fully understood before operating the machine.

The manufacturer has no direct control over misuse of the machine. Responsibility for safe operation therefore rests solely with the owner, user, and operator.

All instructions and safety warnings in this manual are based on operation under normal conditions and on the assumption that the machine has not been modified from its original design.

The correct use and application limits of the cutting table depend on the selected combination of module, tool, and material.

Any use of the flatbed beyond the capabilities of the selected tool–material combination is considered improper use and may result in personal injury and/or serious damage to the machine. Use of the machine in this manner voids all warranty coverage.

Installation of the machine, accessories, and spare parts may only be carried out by trained and authorized personnel. All maintenance procedures must be performed by qualified personnel in accordance with this manual.

2 SAFETY & OPERATING ENVIRONMENT

2.1 Symbols used in this manual

	Warning with dark (red) symbol: Refers to immediate threat that can cause serious injuries and effects on health and safety.
	Warning with light (yellow) symbol: Refers to a dangerous situation that can cause injuries and serious damage to the machine.
	Attention with dark (red) symbol: Refers to useful information to prevent damage to the equipment and prolong the service life of the machine.
	Attention with light (yellow) symbol: Refers to useful tips to enhance user-friendliness and make the work significantly easier.
	Note: Can be considered as a general tip, something that is useful to know.

2.2 Safety symbols on the machine

Safety labels are used on some parts of the machine. They are explained below.

	Caution Servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock do not perform any servicing other than prescribed in the operating instructions.
	Caution Contains Class 2 laser. Do not stare into the beam.
	Caution Sharp edges. Touching the tools with bare hands may cause injury. Do not touch.
	Caution Moving parts. Keep away from moving parts Avoid the cutting area with the hands, clothing, jewellery or hair.
	Caution Hot surface. Do not touch marked parts.

Warning
Eye and ear protection must be worn.

Make sure to observe all the caution labels on the machine.

There are no user-serviceable parts inside. For servicing refer to qualified personnel only.

Turn off the table and contact a service representative in any of the following cases.

- There is visible mechanical damage.
- The power cord is damaged.
- The table is (partially) damaged by impact
- Liquid was spilt on the table.
- There is a strange noise, smoke or an unusual smell coming from the table.

2.3 Safety precaution

WARNING:
The equipment is not suitable for use in locations where children are likely to be present.

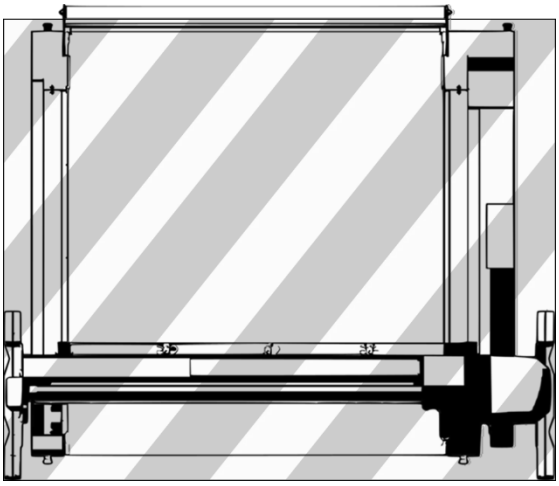
2.3.1 Safety precautions related to movement

Danger areas related to movement can be split up into three parts

WARNING:
There is a risk of injury from being caught or trapped in moving machine parts.

Keep hands, hair, clothing and jewellery away from moving parts. Do not wear jewellery, loose clothing or sleeves, scarves or open jackets.

2.3.1.1 General danger area

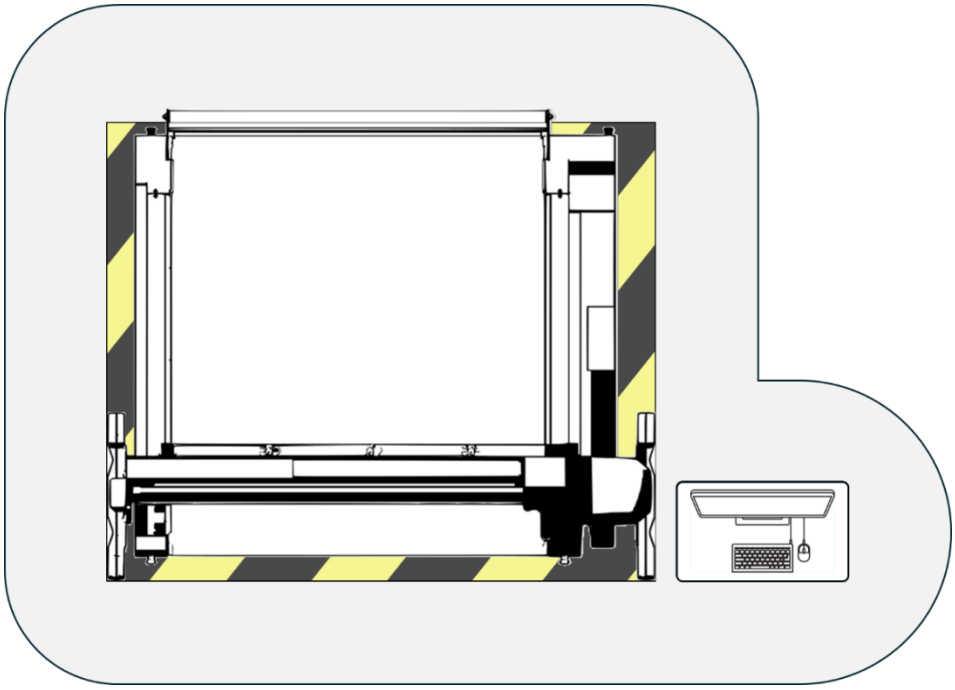


The complete table surface is considered to be a danger zone. This includes the moving parts and the area in which it operates.

WARNING:

Top beam is wider than the table surface

2.3.1.2 Safety area during operation



During normal operation, the operator must remain outside the hatched safety zone. If the operator enters this zone, the bumpers or optical safety sensors will detect the presence of the operator and automatically pause the machine.

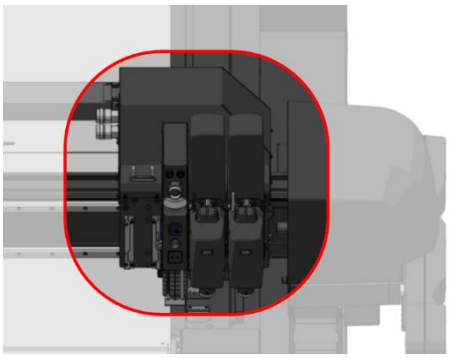
The active job is retained; however, all movement on the cutting table will stop until the operator exits the safety zone and resumes operation via *GoProduce*.

WARNING: When operating in the hatched area to change media or tools., the procedure needs to be followed strictly, as described further in the manual.

The safety area for other personnel is marked in light grey. It covers 1 meter outside the danger area and 1 meter away from the operator's desk.

2.3.1.3 Danger area around the head

During module and tool installation, the head and an area of approximately 20 cm surrounding it shall be regarded as an additional hazard zone. When operating within this zone, the operator must exercise increased caution.



Replacing a module or tool requires the operator to perform specific actions inside the hazard zone around the head. Before starting these actions, the operator must ensure that the machine cannot perform any unexpected movements. This can be achieved in one of the following ways:

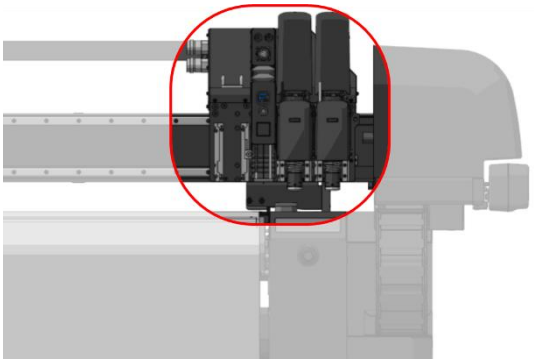
- Switching off the machine
- Performing a tool change strictly in accordance with the specified change procedure.

Warning: When changing a module or a tool, always make sure that GoProduce Flatbed Edition is initiated and check if the machine is offline, this to ensure it won't move.

2.3.2 Safety precautions related to the laser pointer

WARNING:
Central unit contains a build-in laser pointer Class 2. Do not stare into the beam.

There's a laser pointer on the carriage to help define the position of the carriage and set the machine's working zone. The laser is in the central unit, pointing downwards to the conveyor.



Laser complies with CFR Title 21, Chapter I, Subchapter J, Sections 1010.2, 1010.3, 1040.10 and 1040.11 in effect at the manufacturing date. Use of any controls, adjustments or procedures other than those specified may result in hazardous radiation exposure.

2.3.3 Safety precautions related to tools

WARNING: The F series cutters use razor-sharp tools. Touching the tools with bare hands may cause injury. Do not touch the tools while the machine is cutting.

All knives and router bits should be handled with caution to prevent injury.

WARNING: Eye and ear protection is necessary when using certain power tools

Router options and tool holders using pneumatic air produce loud noises. When exposed for prolonged periods of time, the user must use ear protection. The router option may throw around debris, eye protection is needed when using the router option.

2.3.4 Safety Features

2.3.4.1 Controlled start-up

Before switching on the machine, it must be connected to the computer. The program GoProduce Flatbed Edition must then be running; otherwise, the machine will not start.

Shortly after the machine is powered on, an on-screen message will appear prompting the operator to confirm the startup.

2.3.4.2 Bumpers on top beam

For operator safety, bumpers with integrated trip switches are installed on both the left and right sides of the top beam. These switches detect contact with an operator or obstruction in the beam's path. When a bumper is activated, the top beam immediately stops to prevent injury or damage.

2.3.4.3 Light barrier

Optical sensors are mounted in the bumpers, safety beams are created alongside the top beam. If the light beam is interrupted, the machine stops. The interruption is a controlled stop. Within five seconds the machine will stop moving and hold its position. It's possible to resume the job after user confirmation.

2.3.4.4 Emergency buttons

There are emergency buttons on each corner of the flatbed, allowing to switch off the machine immediately. When pressed, power to the motors is cut, stopping the machine in an instant.

Current job information is lost when using the emergency stop. To unlock an activated emergency button, turn it clockwise.

2.3.4.5 Overcurrent

Electric current through the motors is monitored. When overcurrent is detected, power is cut off and a fatal error message will be displayed in GoProduce.

WARNING:
All the built-in safety features cannot prevent the high level of kinetic energy that can be released during an emergency stop or an unforeseen malfunction of the machine.

There are no guarantees safety features eliminate the risk of injury

2.3.5 Personal protective equipment

The required safety equipment depends on the installed modules and the material that needs to be cut.

During operating or servicing the machine the operator should wear close-fitting clothing and use appropriate protective equipment.

Appropriate protective equipment include:

- Work clothes.
- Safety goggles, when large particles can be generated.
- Ear protection if the continuous sound pressure level is above 80dB.

WARNING: There is a risk of injury from being caught or trapped in moving machine parts. Keep hands, hair, clothing and jewellery away from moving parts. Do not wear jewellery, loose clothing or sleeves, scarves or open jackets.

2.4 Operating environment

Environmental conditions affect the machine's performance significantly. The restrictions or recommendations for the ideal operating environment are described in the site preparation document. The environmental conditions of the machine (without media) are as follows:

Operating Temperature	15 to 35° C	59 to 95° F
Storage temperature	-30 to 70° C	-22 to 158° F
Relative humidity	35 - 75 %, non-condensing	

WARNING: When routing, the chiller is used and the max operating temperature cannot exceed the max ambient temperature of 30°C (86°F).

It is possible that the environmental conditions of the used media are stricter than those of the machine. Please refer to the documentation about the used media.

Make sure that the material has had enough time to acclimatize.

3 FLATBED COMPONENTS

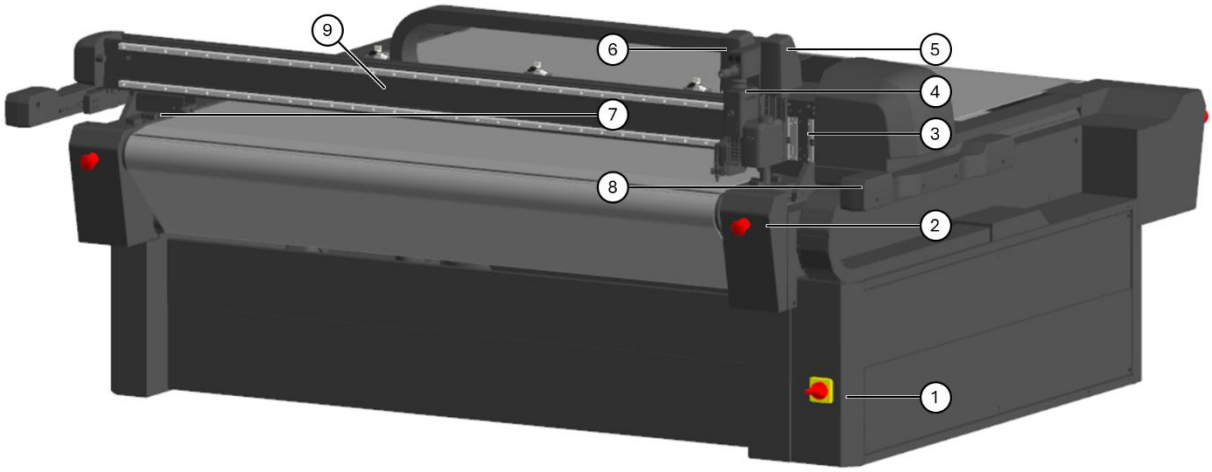
The flatbed has no control panel or screen. Everything is done with an attached computer and use of the program GoProduce Flatbed Edition.

F series machines are delivered without power plug. The power cable is made on-site, guided through the power cable entry and connected inside the machine's electrical cabinet.

Machine orientation: The power switch is in the front right of the machine.

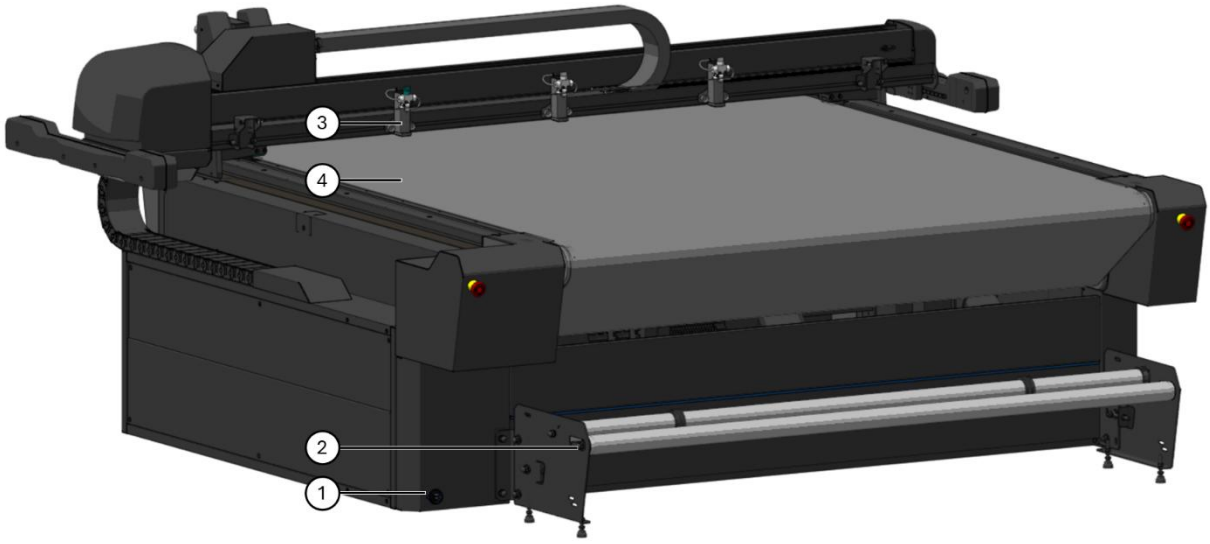
- X-axis: From front to back.
- Y-axis: From right to left.
- Origin: Situated on the front right side

3.1 Front view



1. Power switch: This is used to switch the machine's power on or off. The OFF power switch position can be secured with a padlock
2. Emergency button: There are four emergency buttons on the flatbed. Once pressed, they stay in a safe locked position. Turn clockwise to release.
3. Carriage: The carriage can hold up to three removable modules and has a fixed central unit. The carriage moves across the top beam to cover movements in Y-direction.
4. Central unit: The central unit houses a positioning laser, depth sensor and an integrated camera system for fast and accurate registration mark recognition.
5. Tangential module (optional): The tangential module is used for the tangential tools.
6. Drag head module: The drag head module comes standard with the flatbed cutter for measuring the table profile. Additionally, it can be used to mount the pen or drag knife.
7. ADC (Automatic Device Calibration): On both sides of the machine an ADC is present. This is used for knife and hight calibrations of the installed cutting tool.
8. Safety bumpers: These bumpers have trip switches and optical sensors to detect any presence of obstruction to the top beam, making the machine stop in hazardous conditions.
9. Top beam: The beam moves back and forward over the table surface to perform operations in X-direction.

3.2 Rear View



1. Ethernet connection: IP address range

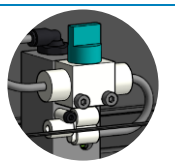
LAN setup – Range 10.100.0/24	
PC	10.100.0.1
Cutter	10.100.0.10
Camera	10.100.0.11
Feeder PLC	10.100.0.100
Feeder HMI	10.100.0.101

WAN setup – Range 10.200.0/24	
Router	10.200.0.1
PC	10.200.0.2

2. Roll support: Media roll support bars and a set of core holders for loading roll material.

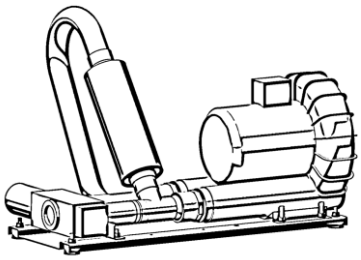
3. Pneumatic clamps: Pneumatic media advance system. In order to work continuously, it clamps the media and holds it down while feeding it forward.

NOTE: The clamps hold the media down. Enable or disable the clamps by turning the knob on top of each clamp.



4. Conveyor belt: The conveyor system feeds the media. The belt is powered by the top beam by pulling the conveyor forwards.

3.3 Vacuum pump



For the larger models, the vacuum pump(s) are not located under the table but externally placed. Depending on size, some models have one or two pumps.

4 USER TOOLS

Following tools are delivered with the cutting table:

Hex screwdriver 4mm

Mainly used for a tool change on the carriage

Hex screwdriver 2.5 mm

Used for switching small gliding disks and blades

Summa Tool Wrench

Used to loosen a tool when it can't be removed manually.

Not used for tightening with exception of oscillating tools!

ATTENTION: Do not tighten more than ¼ of a turn 'hand tight' without the wrench.

ATTENTION: Use the tool as indicated. Wrong use will damage the tool irreversibly.

This wrench is delivered together with its tool or module:

Wrench 10 mm

Used to switch the blade of a perforating tool or rotary module

Allen keys are included in a box of cutting blades:

Hex key 1.5 mm

Used to replace the blade of an EOT.

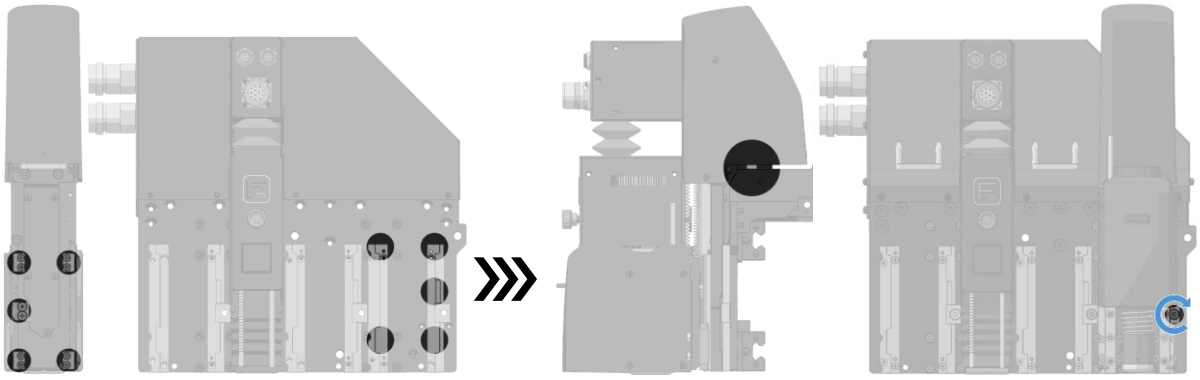
Hex key 2 mm

Used to replace the blade of a POT.

5 MODULES AND TOOLS

5.1 Installing a module

WARNING: For safety reasons, always make sure no tool is installed in the module. Only install a module when the flatbed is switched off or after clicking 'Change Tool' in Axis Control.

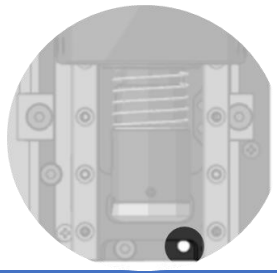


To install a module, line up the 5 highlighted areas and slide the module down. The module glides into the carriage in the dovetail guiding. Do not use excessive force, otherwise the connector can be damaged. When in doubt, recheck the alignment. The module must be pushed down approximately 15 mm (0,6") and is secured with one screw at the right side.

Before securing the module check if the connector of the module is completely seated in the connector of the carriage.

5.2 Removing a module

To remove a module, loosen the screw at the right side of the module counterclockwise by one turn with a 4mm hex screwdriver. Put this screwdriver in the hole on the right side under the module. Gently lift the module with the screwdriver 3 to 4 mm (0.12 to 0,16"). Guide the module manually for an extra 10 mm (0,4") and remove it from the carriage. The drag module does not have such a hole.



NOTE: Unused modules should be removed from the carriage. Leaving unused modules installed can reduce cutting quality.

5.3 Central unit

The central unit houses a positioning laser, ultrasonic material-thickness sensor and an integrated camera system.

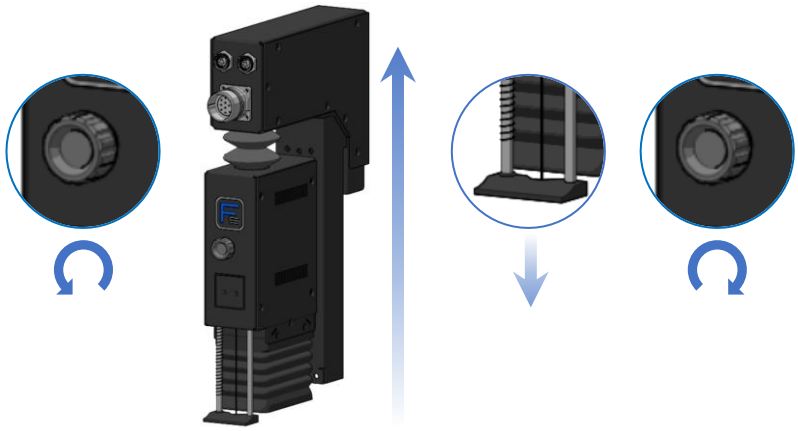
Contour cutting uses registration marks (regmarks). The camera is used for fast and accurate regmark recognition.

The unit has a dedicated connector for tools that require high electrical current.

Both the knob and black camera adjustment plate is part of the manual height adjustment mechanism. For contour cutting, the height needs to be adjusted each time another material thickness loaded

Adjust Camera Height:

1. Put media under the camera / Put camera above the media
2. Release the central unit by turning the knob counterclockwise and lift it to its top position.
3. While holding the unit, push the camera adjustment-plate down onto the media.
4. Hold the adjustment-plate onto the media and secure the unit by turning the knob clockwise.
5. Let the adjustment-plate go

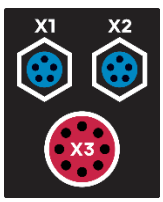


5.4 Modules

Up to three modules can be installed onto the carriage. The carriage has a central unit, which is fixed to the carriage and cannot be taken off.

Some modules need compressed air. There are two connections on the side of the carriage. The higher connection with dry air and the lower with lubricated air.

On the central unit there are three electrical connectors for modules or tools that need extra power.



X1: Used for modules or tools in module slot 1.

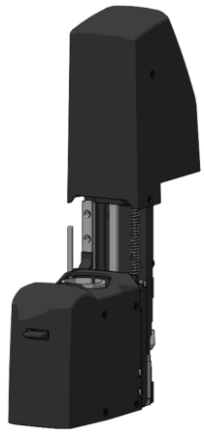
X2: Used for modules or tools in module slot 2 or 3.

X3: Used for the Power EOT.

ATTENTION: It is recommended to remove the module when not in use.

Tools for Versatile module	Single tool modules
Kiss cutting tool	Drag head module
Cutout tools	Rotary module
Corrugated tool	Standard router
Bevel cut tool	High-Frequency router
V-Cut tools	
EOT – POT – POT-L	
Perforating Tool	
Creasing tools	

5.4.1 Versatile Module

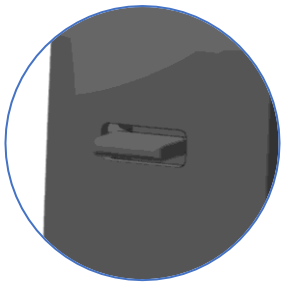


The tangential module offers a vertical force up to 20kg and corresponds to a wide range of matching tools. Each tool has a barcode ID that ensures automatic recognition and separate parameter settings.

For each application, a corresponding tool can be installed into the tangential module.

The tangential module comes in two different versions:

- CORE+ Tangential module:
  Speed and accuracy, on which Summa has built its reputation.
  20kg vertical downforce
- FAST+ Tangential module:
  Faster up-down movements without losing precision or cutting quality.
  10kg vertical downforce

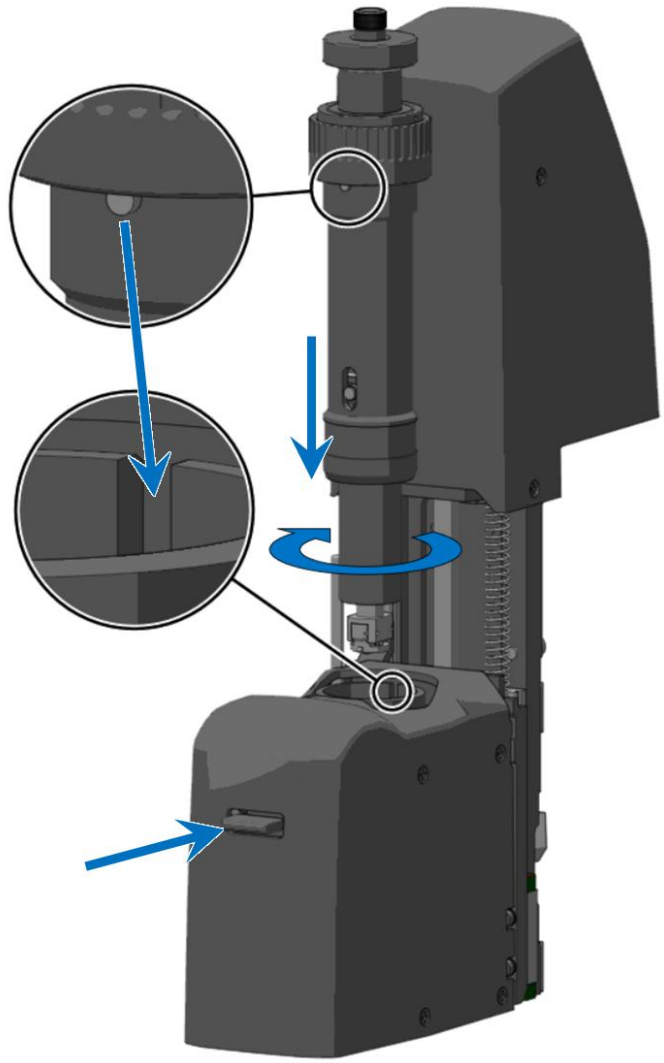


The flat front knob serves to hold the internal shaft steady while installing or removing a tool. This is explained in detail in the next section.

5.4.1.1 Kiss Cutting Tool

The Kiss Cutting Tool is used to cut the materials down to their liner, up to 1,2 mm thick. It features mechanically controlled pressure, up to 2000 grams. The nose piece ensures precise depth control, delivering clean, consistent result.

Change Tool

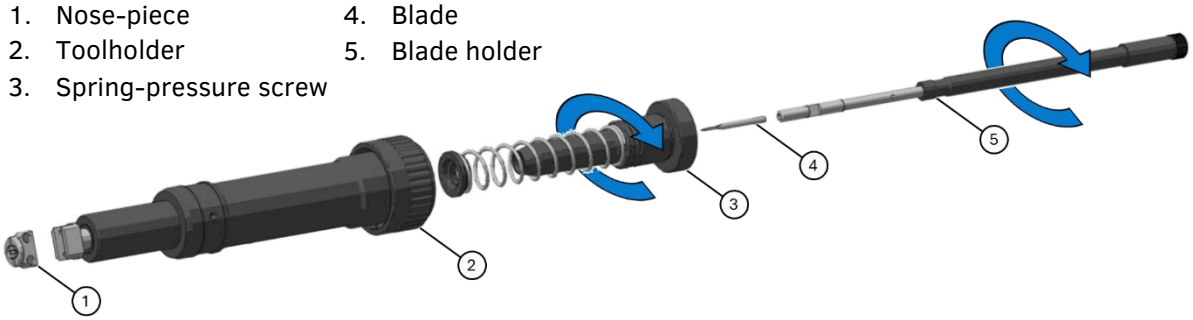


- Put the tool into the module
- Turn the tool whilst holding the front knob of the module until the pin of the tool falls into the slot of the module.
- Turn the black ring until the tool is fixed in place

ATTENTION: Do not overtighten the tool in the tangential module.

Tool components

1. Nose-piece
2. Toolholder
3. Spring-pressure screw
4. Blade
5. Blade holder



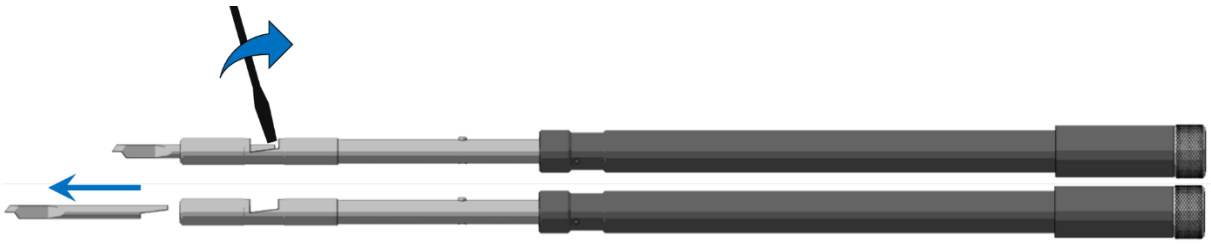
Knife pressure

Pressure on the knife can be adjusted by turning the spring-pressure screw. It comes in three different variants, each with its own range of pressure. Turning the screw out lowers the pressure until it comes out.

- 20-120 grams
- 50-650 grams
- 100-2000 grams

ATTENTION: Knife pressure is needed to pierce the material. It should not control the knife depth. Knife depth is controlled with the nosepiece

Replacing the knife



- Remove the knife-holder out the tool by turning it out the spring pressure screw. There is no need to remove the screw.
- Push the knife out the wedge of the knife holder with a flat screwdriver
- Insert the new knife into the holder, the wedge keeps it in place. The blade should not be able to fall out
- Put the knife holder back in the tool by turning it back in the spring pressure screw.
- Adjust the knife dept back and forward in the nosepiece by turning the knife holder left and right.

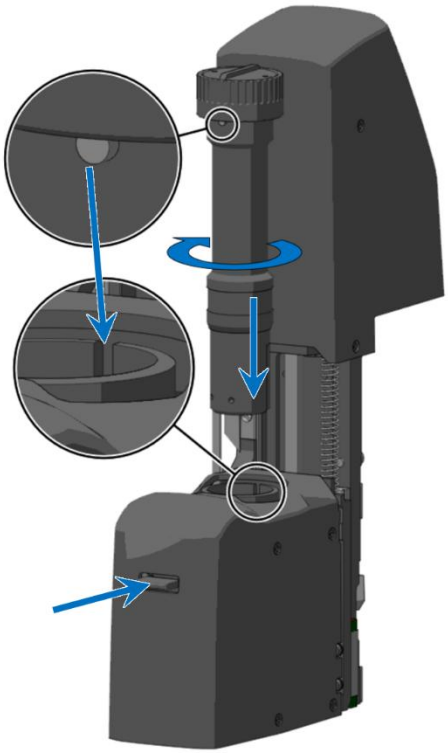
5.4.1.2 Cutout Tools

Cutout Tools uses a static blade to thru-cut the material. Summa features five different Cutout Tools for the tangential module. These tools may feature a gliding disk, used as an extra to keep the material down on the machine while cutting.

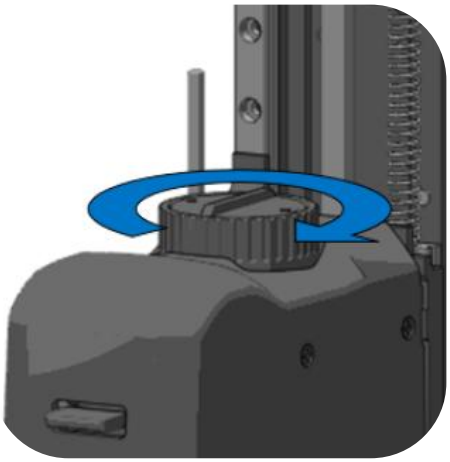
No gliding disk	Narrow gliding disk	Large gliding disk
Heavy Duty Cutout Tool	Single Edge Cutout Tool Double Edge Cutout Tool	High Precision Cutout Tool Rigid Material Cutout Tool

5.4.1.2.1 Heavy Duty Cutout Tool

Change Tool

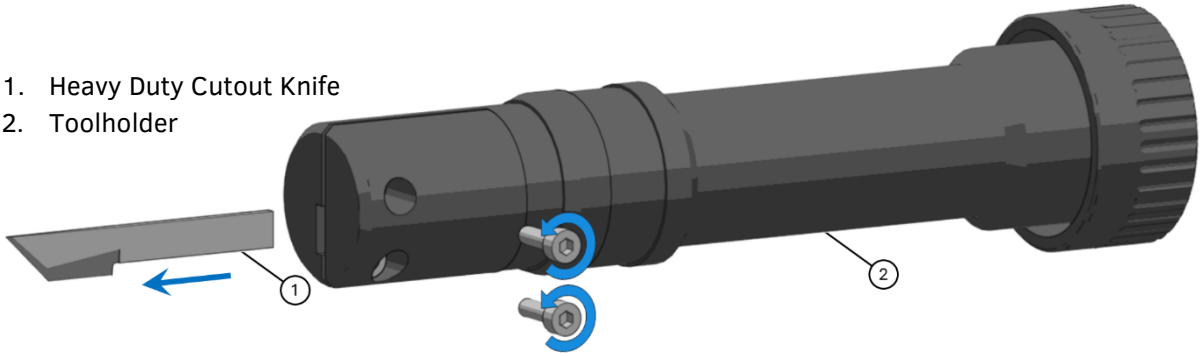


- Put the tool into the module
- Turn the tool whilst holding the front knob of the module until the pin of the tool falls into the slot of the module.
- Turn the black ring until the tool is fixed in place



Tool components

1. Heavy Duty Cutout Knife
2. Toolholder



Removing the knife

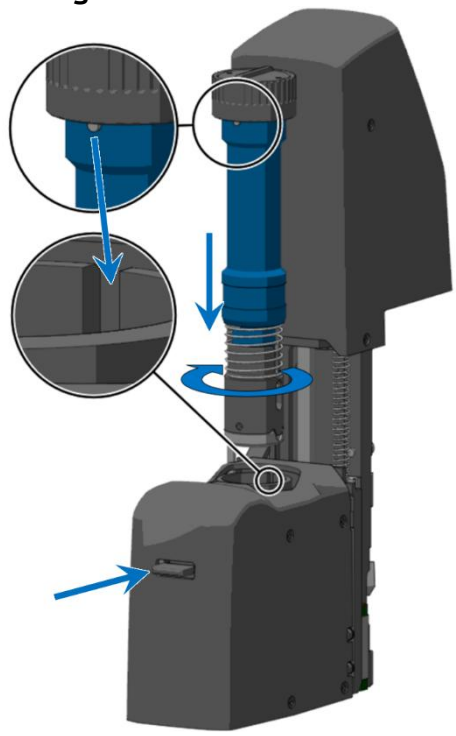
- Loosen the two screws a few turns
- Carefully take out the knife

Installing the knife

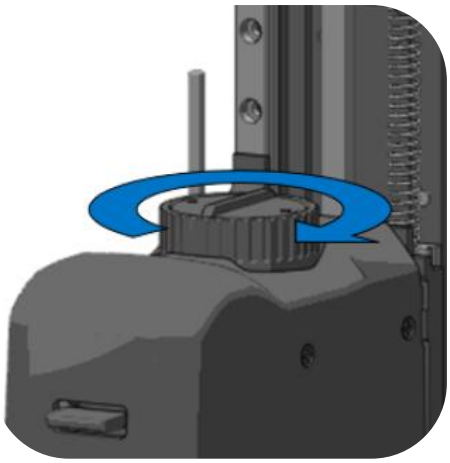
- Loosen the two screws a few turns
- Gently slide the knife into the tool
- Tighten the two screws

5.4.1.2.2 Single & Double Edge Cutout Tools

Change tool

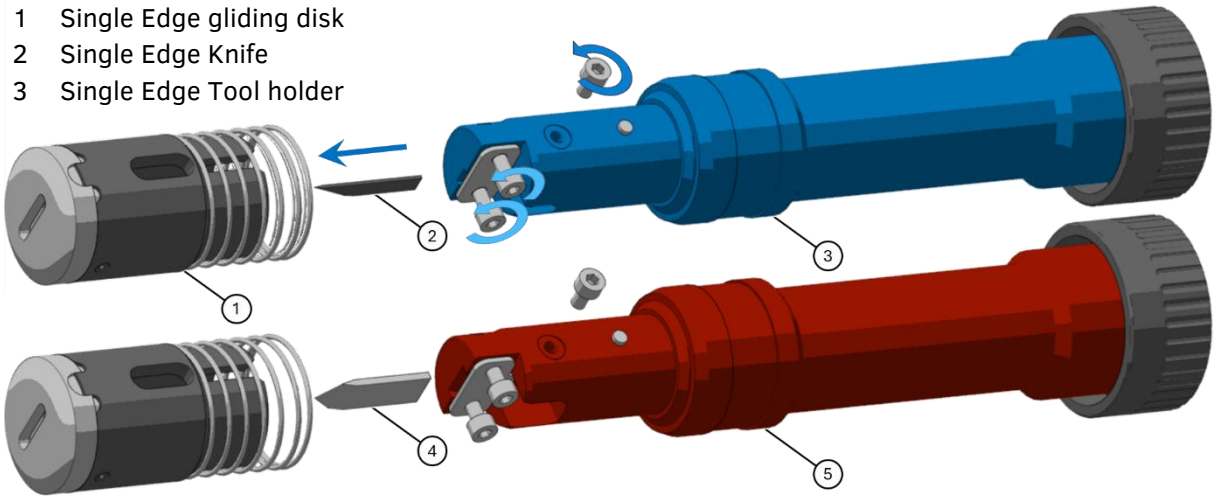


- Put the tool into the module
- Turn the tool whilst holding the front knob of the module until the pin of the tool falls into the slot of the module.
- Turn the black ring until the tool is fixed in place



Tool components

1 Single Edge gliding disk
2 Single Edge Knife
3 Single Edge Tool holder



4 Double Edge gliding disk
5 Double Edge Knife
6 Double Edge Tool holder

Removing the blade

- Take out the screw of the gliding disk
- Remove the gliding disk
- Loosen the two screws of the blade
- Carefully take out the blade

Installing the blade

- Loosen the two screws of the blade
- Gently slide the blade into the tool
- Tighten the two screws
- Put the gliding disk over the tool holder
- Put gliding disk screw back in

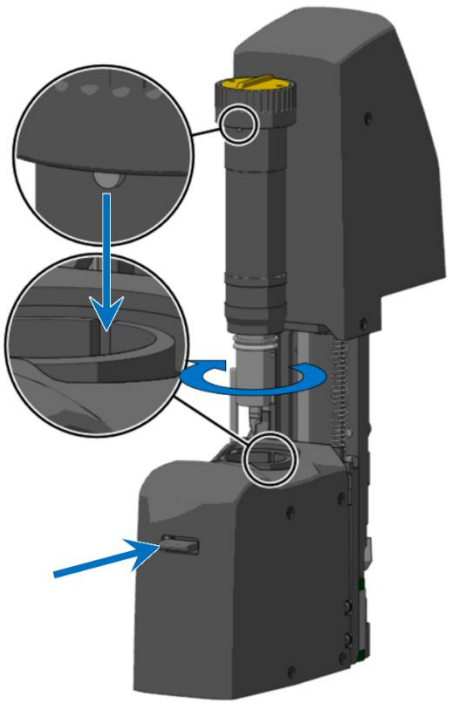
5.4.1.2.3 High Precision Cutout Tool & Rigid Material Cutout Tool

Universal Cutout Tool comes in two versions, Precision and Rigid. Precision blades are better suited for fast, nimble and precise jobs. Rigid blades are better suited for thicker materials and jobs where other Cutout Tools would break.

<u>High Precision Cutout Tool</u>
- Gold tool
- Ø6 mm blades

<u>Rigid Material Cutout Tool</u>
- Silver tool
- Ø8 mm blades

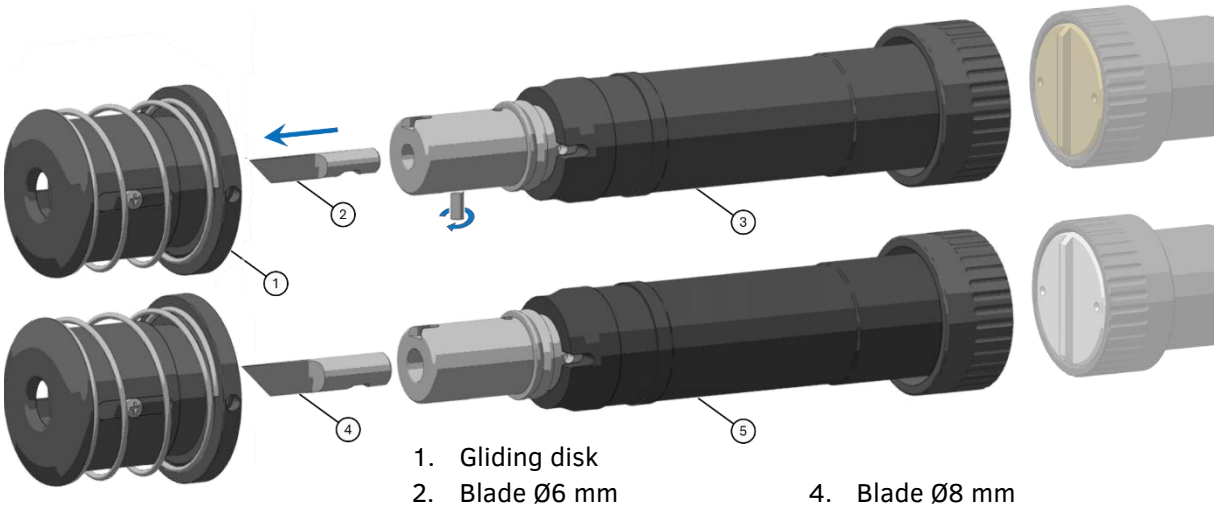
Change tool



- Put the tool into the module
- Turn the tool whilst holding the front knob of the module until the pin of the tool falls into the slot of the module.
- Turn the black ring until the tool is fixed in place
- Put on the large gliding disk by pushing it whilst turning until it snaps in place.

WARNING: Never leave the tool on the machine without the gliding disk. Immediately install the gliding disk.

Tool components



1. Gliding disk
2. Blade Ø6 mm
3. Toolholder Ø6 mm blades
4. Blade Ø8 mm
5. Toolholder Ø8 mm blades

Removing the blade

- Push the gliding disk off with your thumbs while pointing the tool away from you
- Loosen the screw holding the blade in place
- Carefully take out the blade

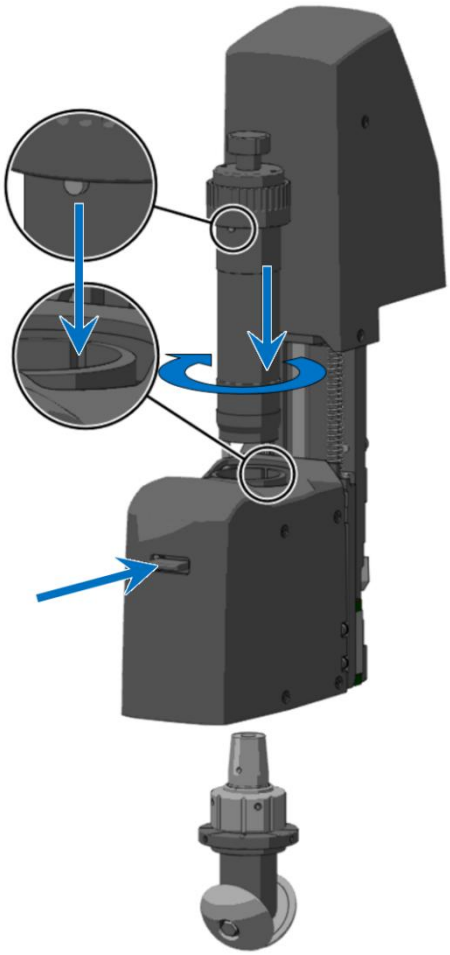
Installing the blade

- Loosen the set screw of the blade
- Gently slide the blade into the tool. Note the keyway of the blade points to the set screw
- Tighten the set screw
- Point the tool away from you. Put the gliding disk over the tool holder, turn while pulling until it snaps in place.

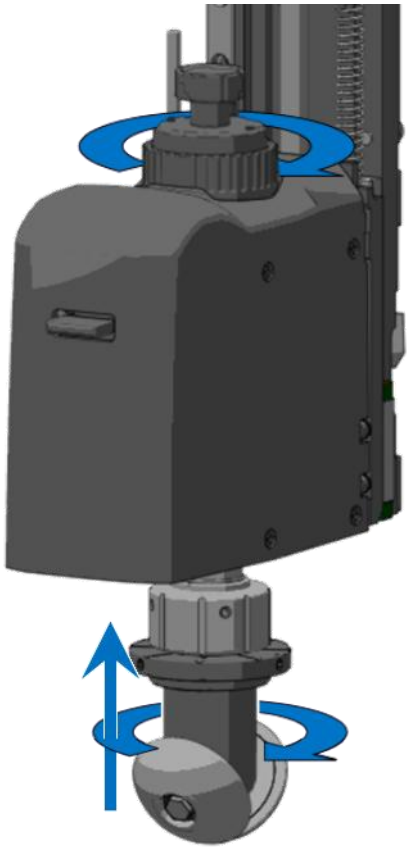
5.4.1.3 Corrugated Tool

The Corrugated Tool is ideal for cutting packaging materials. Its patented wheels provide a smooth, die-cut-like finish by pressing down the material, ensuring precision cuts with a high-quality finish.

Change tool

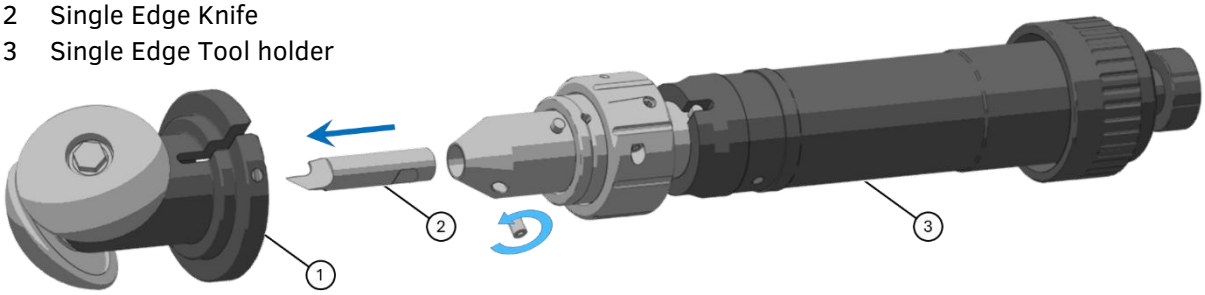


- Put the tool into the module
- Turn the tool whilst holding the front knob of the module until the pin of the tool falls into the slot of the module.
- Turn the black ring until the tool is fixed in place
- Put on the wheels by pushing it whilst turning until it slots in place. Turn the small knob on top of the tool to secure it in place.



Tool components

1 Single Edge gliding disk
2 Single Edge Knife
3 Single Edge Tool holder



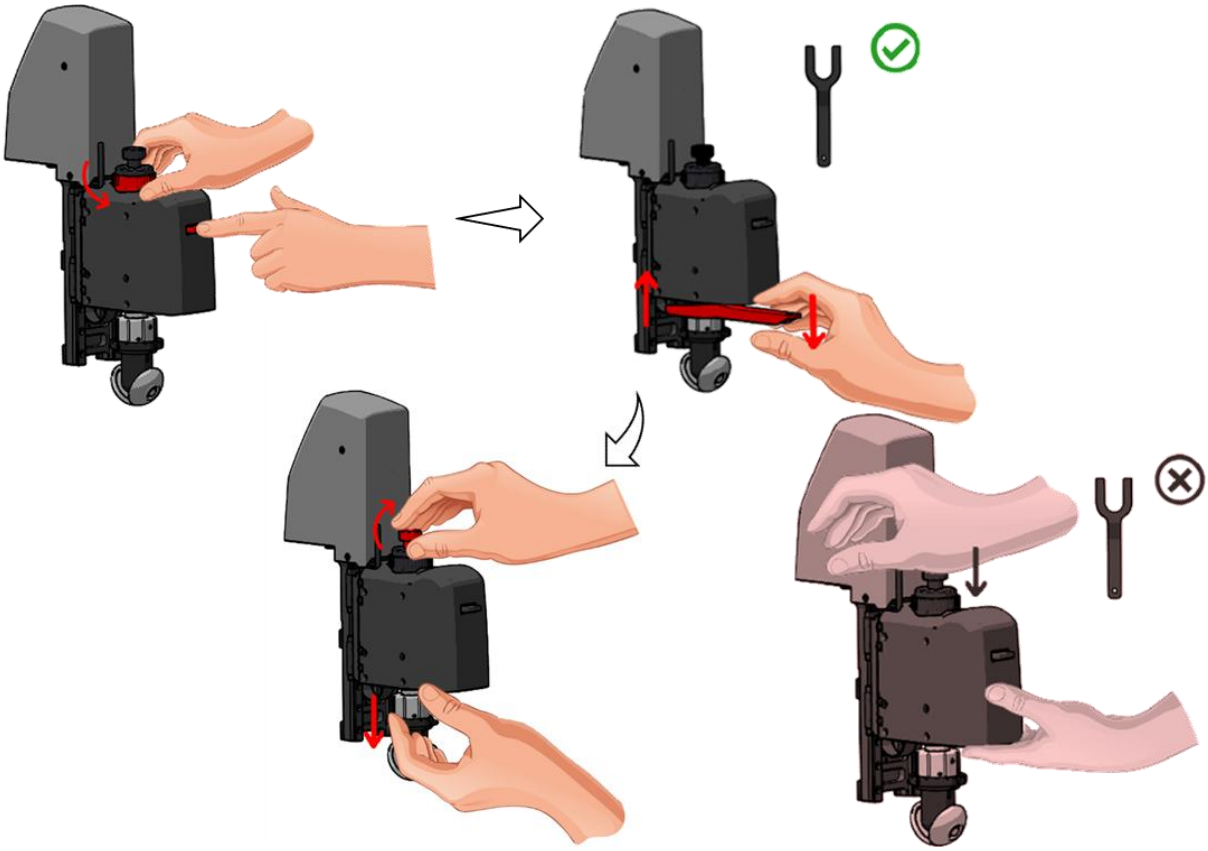
Removing the knife

- Push the wheels off with your thumbs while pointing the tool away from you
- Loosen the screw holding the knife in place
- Carefully take out the knife

Installing the knife

- Loosen the set screw
- Gently slide the knife into the tool. Note the keyway of the knife points to the set screw
- Tighten the set screw
- Point the tool away from you. Put the wheels over the tool holder, turn while pulling until it snaps in place.

Removing the wheels

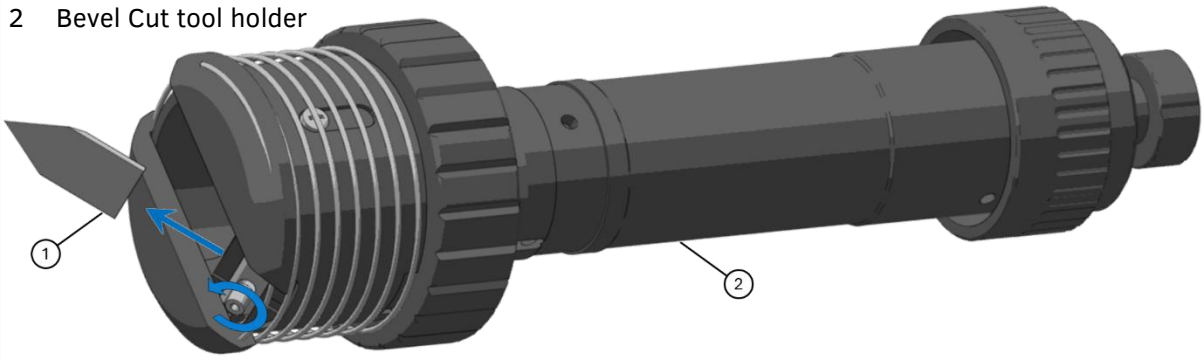


- Rotate the tool while pressing the button on the front of the module until the pin clicks.
- Loosen the top fixation screw while keeping the pin pressed.
- Use the tool to disengage the wheels from the tool
- Hold the wheels while you loosen the top fixation screw.

5.4.1.4 Bevel Cut tool

The Bevel Cut Tool features a short, stable knife ideal for cutting V-shaped grooves into rigid materials like deco felt and rubber. It also creates clean, accurate fold lines in solid board, which is perfect for creating high-end packaging. When precision and presentation matter, this tool delivers a premium finish.

1 Bevel Cut knife
2 Bevel Cut tool holder



Removing the knife

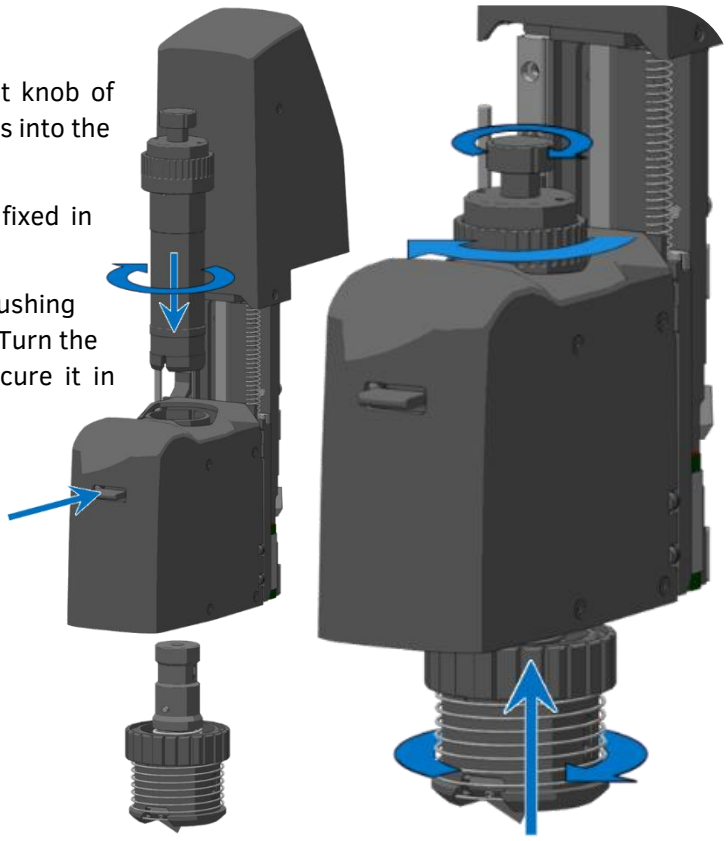
- Pul back the gliding disk and loosen the set screw
- Carefully take out the knife

Installing the knife

- Pul back the gliding disk and loosen the set screw
- Carefully put in the knife and tighten the screw

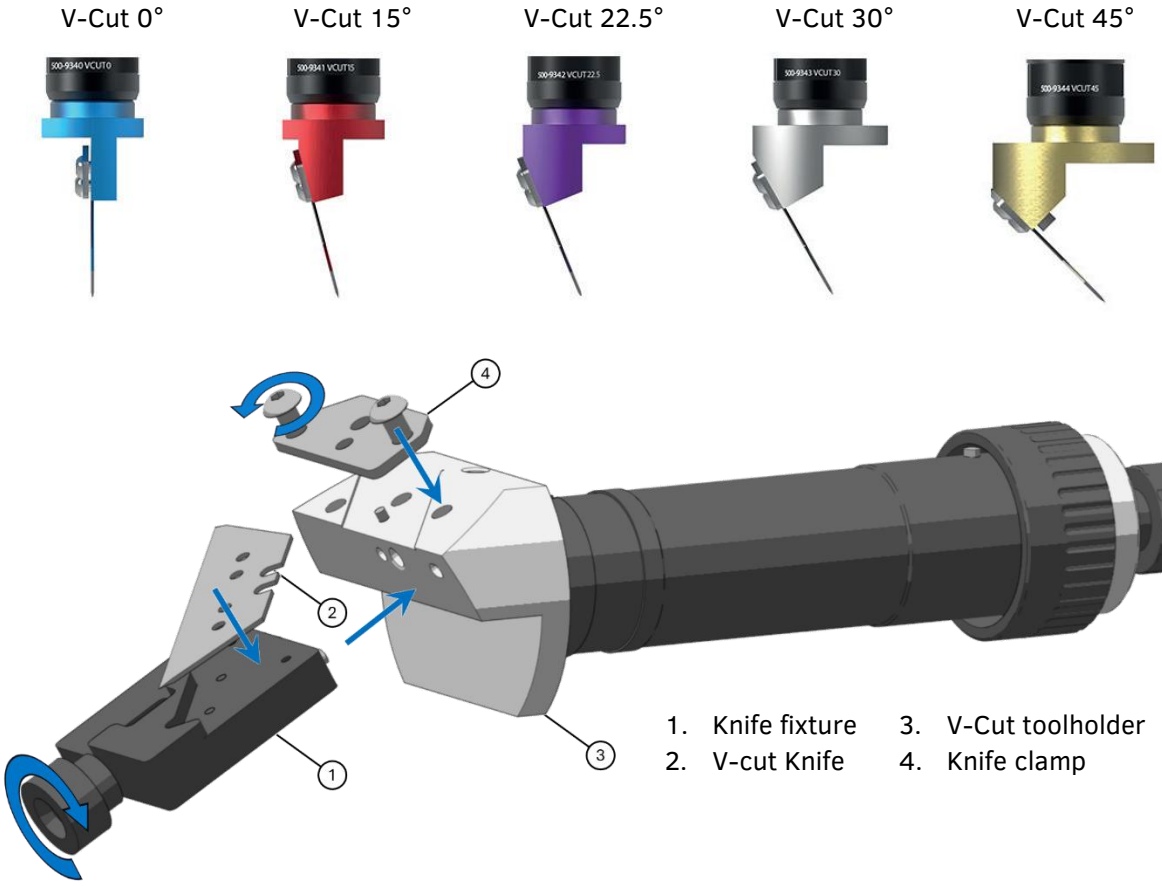
Change tool

- Put the tool into the module
- Turn the tool whilst holding the front knob of the module until the pin of the tool falls into the slot of the module.
- Turn the black ring until the tool is fixed in place
- Put on the gliding disk with blade by pushing it whilst turning until it slots in place. Turn the small knob on top of the tool to secure it in place.



5.4.1.5 V-Cut tools

The V-Cut Tools are available in five angles and are designed to cut a V-shaped groove in rigid sandwich and foam composite boards up to 27 mm thick.



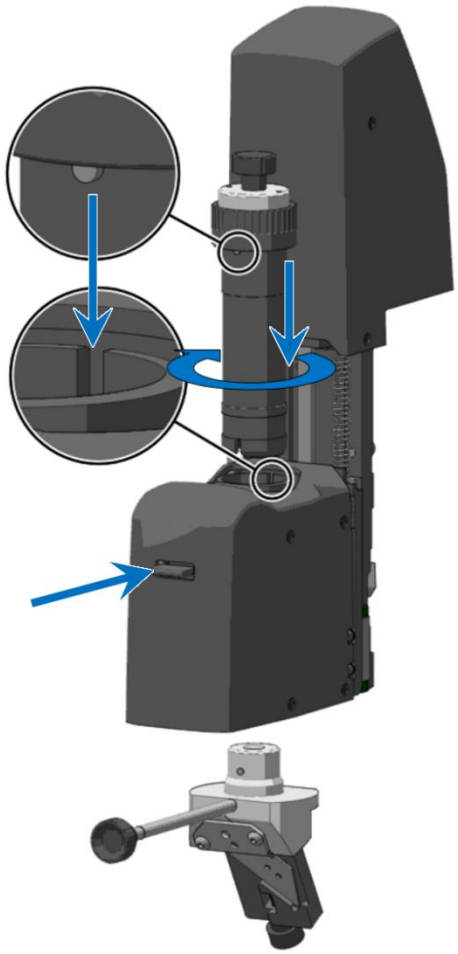
Removing the knife

- Loosen the screws of the knife clamp
- Carefully take out the knife

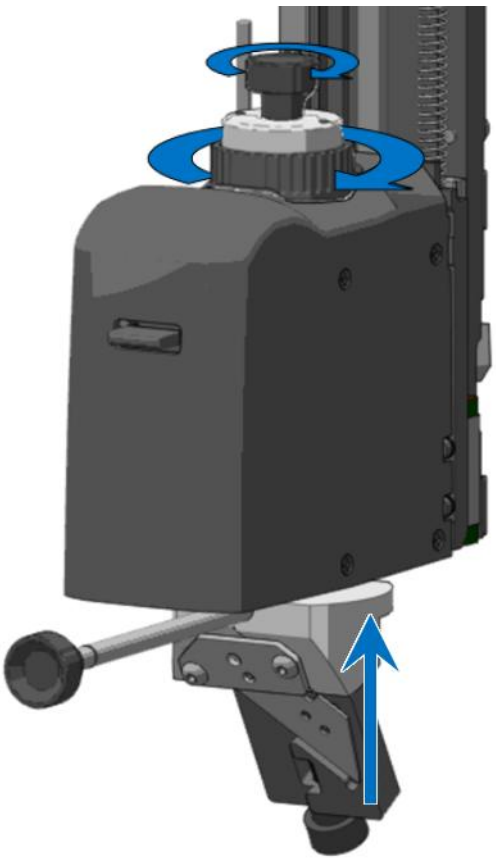
Installing the knife

- Put the knife in the fixture
- Fasten the fixture into the toolholder
- Screw the knife clamp in place
- Take the fixture of the toolholder

Change Tool



- Put the tool into the module
- Turn the tool whilst holding the front knob of the module until the pin of the tool falls into the slot of the module.
- Turn the black ring until the tool is fixed in place
- Put the blade on by inserting it whilst turning until it slots in place. Turn the small knob on top of the tool to secure it in place.
- Remove the threaded rod from the blade holder.

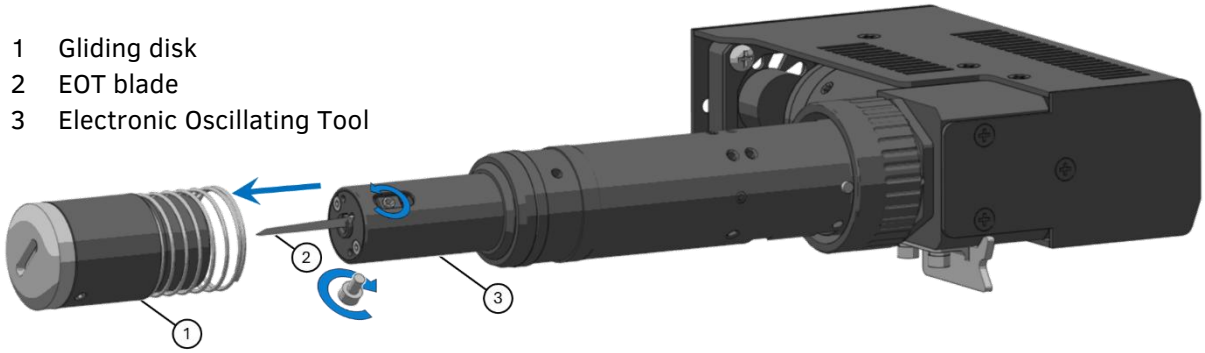


ATTENTION: Do not overtighten the tool in the tangential module

5.4.1.6 Electronic Oscillating Tool | EOT

Cut soft and medium density materials such as corrugated board and foam up to 18 mm thick. The EOT is driven by an electric motor, producing up to 12,000 rpm and moves a knife up and down over a stroke of 1 mm.

1 Gliding disk
2 EOT blade
3 Electronic Oscillating Tool



Removing the blade

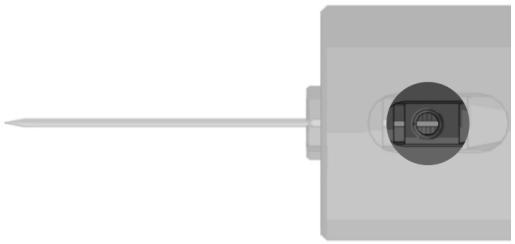
- Remove the cylinder head screw from the gliding disk
- Take of the gliding disk
- Loosen the setscrew from the EOT
- Carefully take out the blade

Installing the blade

- Take out the setscrew of the EOT
- Put the blade in the toolholder*
- Put the set screw back in
- Install the gliding disk

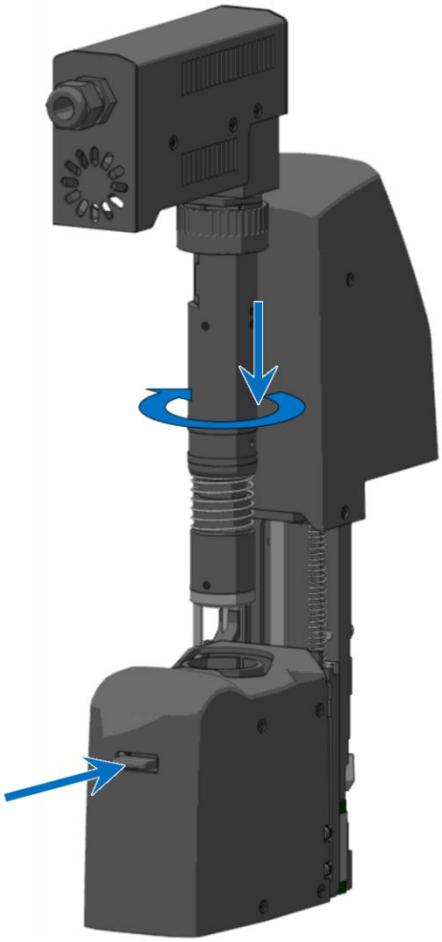
*Mark that the back of the blade is installed completely until the end of the tool. This can be checked by looking through the hole of the setscrew.

*Mark that the back of the blade is installed completely until the end of the tool. This can be checked by looking through the hole of the setscrew.

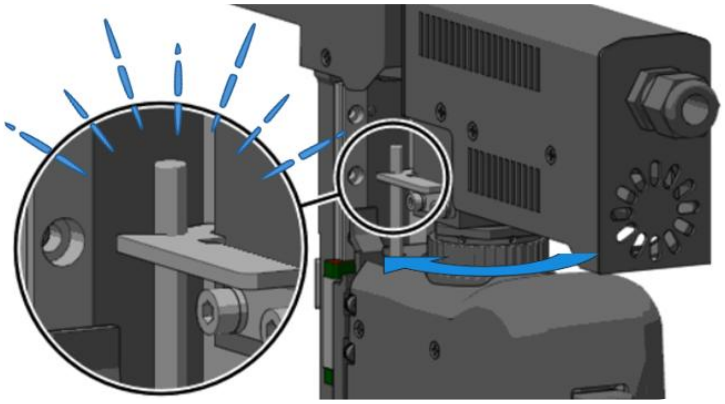


ATTENTION:
Never use the tool or fasten the setscrew without an installed blade.

Change tool



- Put the tool into the module
- Turn the tool whilst holding the front knob of the module until the pin of the tool falls into the slot of the module.
- Turn the black ring until the tool is fixed in place
- Position the tool straight. It snaps onto the metal rod



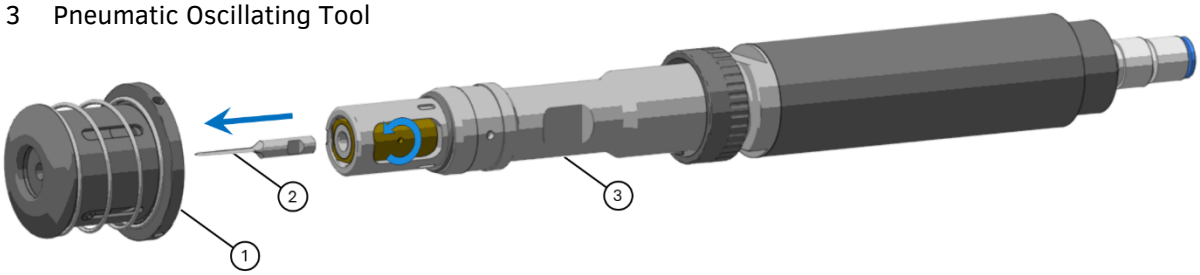
WARNING: If the knife is not in use and it is not completely protected by the gliding disk, it has to be removed from the machine and capped with a safety cap. Do the same when shutting down the machine in the evening.

ATTENTION: Do not overtighten the tool in the tangential module.

5.4.1.7 Pneumatic Oscillating Tool MK2 | POT MK2

The standard Pneumatic Oscillating Tool, powered by compressed air, moves its blade up and down over a stroke of 8 mm. The robust construction of the tool makes it suitable to cut thick material, such as honeycomb board, corrugated board, and foam board.

1 Gliding disk
2 POT Blade
3 Pneumatic Oscillating Tool



Removing the blade

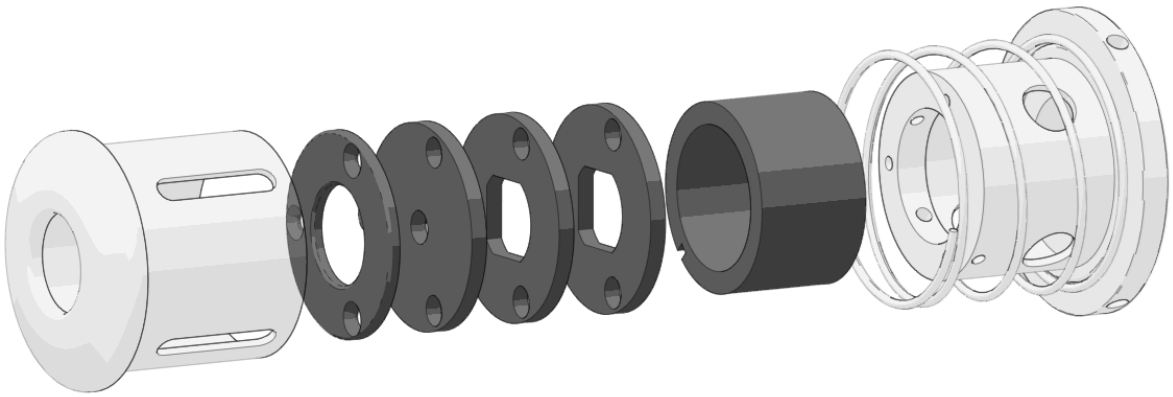
- Push the gliding disk off with your thumbs while pointing the tool away from you
- Loosen the screw holding the blade in place
- Carefully take out the blade

Installing the blade

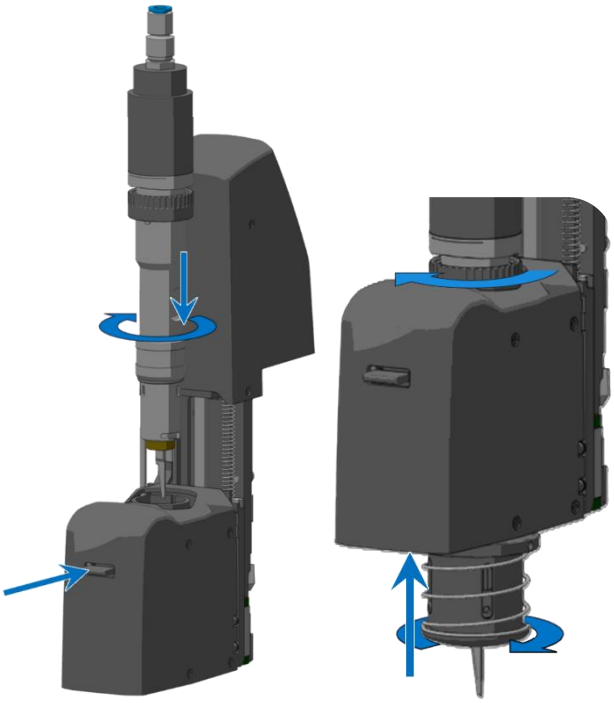
- Loosen the set screw
- Gently slide the blade into the tool. Note the keyway of the blade points to the set screw
- Tighten the set screw
- Point the tool away from you. Put the gliding disk over the tool holder, turn while pulling until it snaps in place.

Gliding disk

The gliding disk (500-0140) contains foam pieces. These pieces are consumables and need to be changed when saturated with oil.



Change tool

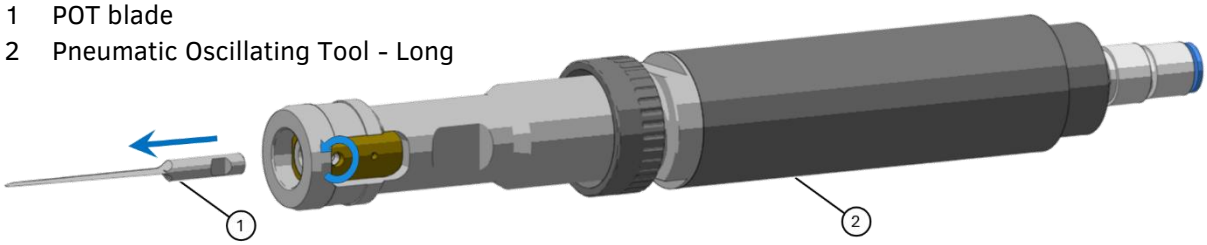


- Put the tool into the module
- Turn the tool whilst holding the front knob of the module until the pin of the tool falls into the slot of the module.
- Turn the black ring until the tool is fixed in place
- Put on the large gliding disk by pushing it whilst turning until it snaps in place.

5.4.1.8 Pneumatic Oscillating Tool – Long | POT-L

The Pneumatic Oscillating Tool-L (POT-L) is an addition to the standard POT and is used with a longer type of blade. The POT-L is able to process thick, soft foams with a maximum thickness up to 42 mm. The robust construction of the tool makes it suitable to cut material, such as honeycomb board, corrugated board and foam board.

1 POT blade
2 Pneumatic Oscillating Tool - Long



Removing the blade

- Loosen the screw holding the blade in place
- Carefully take out the blade

Installing the blade

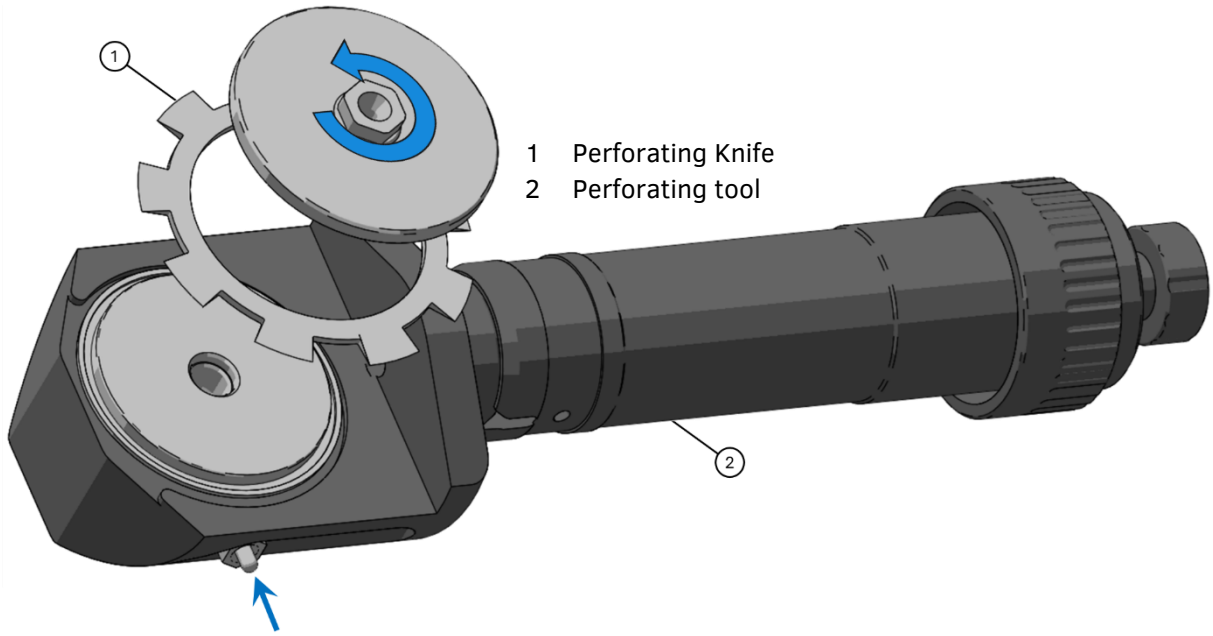
- Loosen the set screw
- Gently slide the blade into the tool. Note the keyway of the blade points to the set screw
- Tighten the set screw

WARNING: Never leave the POT on the machine without the gliding disk. Mount the gliding piece immediately after the POT is mounted in the tangential module.

WARNING: The POT-L has no gliding disk, so do not leave it in the machine if it is not used. If it must stay in the machine, then put a warning sign on the machine

5.4.1.9 Perforating Tool

The Perforating Tool creates clean, efficient perforations, making materials easier to bend or fold with sharp 90° edges for a polished finish. It's ideal for boxes, as it speeds up assembly time while enhancing overall presentation.



1 Perforating Knife
2 Perforating tool

Removing the knife

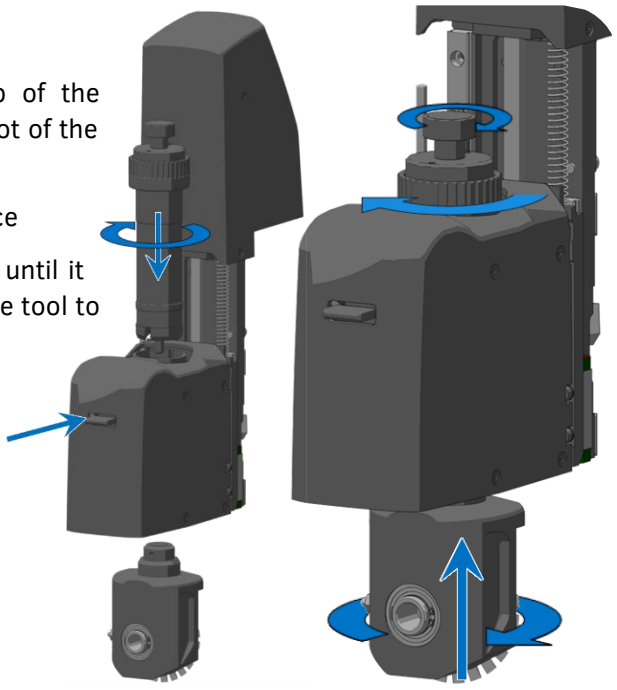
- Push the button on the side
- Turn off the wheel using a 10mm wrench
- Carefully take off the knife

Installing the knife

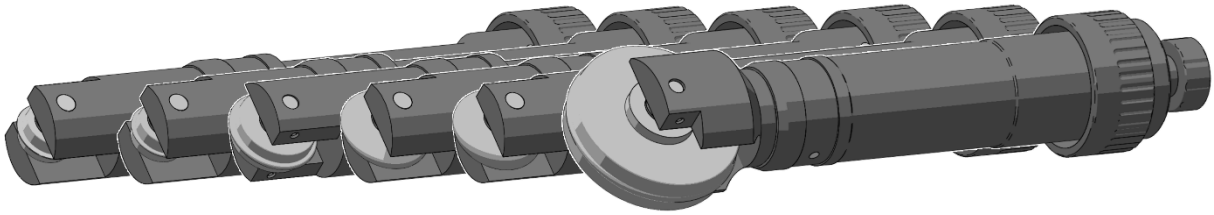
- Put the knife on the toolholder
- Turn the wheel on
- Push the button on the side while tightening the nut with a 10 mm wrench

Change Tool

- Put the tool into the module
- Turn the tool whilst holding the front knob of the module until the pin of the tool falls into the slot of the module.
- Turn the black ring until the tool is fixed in place
- Put the blade on by inserting it whilst turning until it slots in place. Turn the small knob on top of the tool to secure it in place.



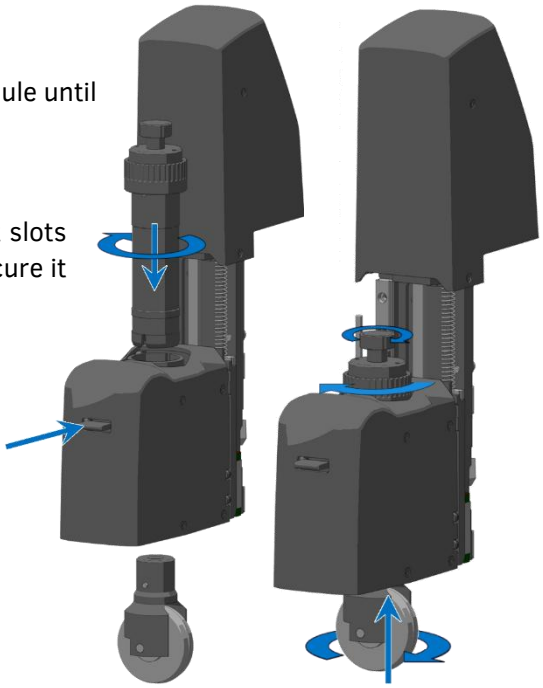
5.4.1.10 Creasing tools



Several creasing wheels, designed in different depths and radius sizes, are available for creasing and scoring paper, cartons, polypropylene and PVC material.

Change Tool

- Put the tool into the module
- Turn the tool whilst holding the front knob of the module until the pin of the tool falls into the slot of the module.
- Turn the black ring until the tool is fixed in place
- Put the blade on by inserting it whilst turning until it slots in place. Turn the small knob on top of the tool to secure it in place.

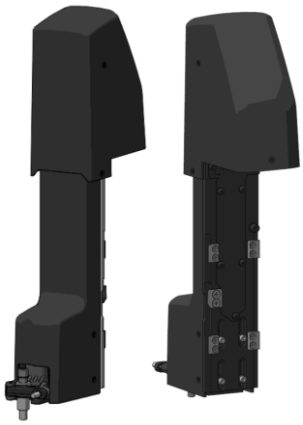


5.4.2 Single Tool Module

Single tool modules are modules with a fixed tool unlike the versatile module where one module can carry a range of tools.

- Drag head module
- Rotary knife module
- Standard router module
- 3.7kW High Frequency router module

5.4.2.1 Drag head module



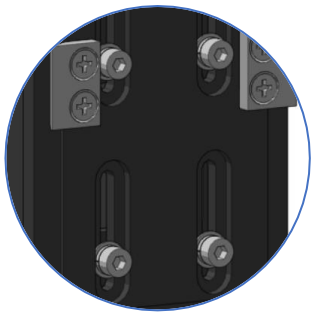
The drag head module comes standard with the machine and is always installed into module slot #1.

The module is a fast-moving drag knife and pen holder for making kiss-cuts or notations on a wide range of adhesive vinyl's. For writing, the height needs to be adjusted.

It can output up to 600 grams of downforce.

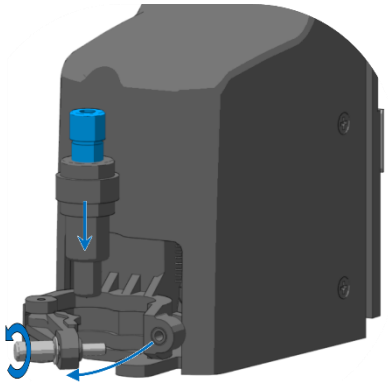
The clearance between the standard drag knife holder and the flatbed base is approximately 3 mm (0.11"). When thicker materials are used, it must be removed.

Adjust module height:



1. Remove the drag head module from the flatbed.
2. Loosen the 4 screws in the back.
3. Move the head to the desired height.
4. Fasten the 4 screws again.
5. Install module on the flatbed and verify the new height.

Installing the tool



- Turn the knob and pull the clamp open
- Put the tool into the clamp
- Clamp the holder and tighten to secure it in place

Tool components

1. Blade holder
2. Blade depth adjustment knob
3. Blade

Replacing the blade

- Turn the knob to push the blade out of the holder
- Carefully pull the blade out
- Turn back the knob completely
- Carefully insert the new blade, and gently tap it on a solid surface
- Turn the knob slowly until the tip extends the required distance
- Insert the knife back into the module

5.4.2.2 Rotary Module

The Rotary Module has a decagonal knife, tangentially controlled, which is driven by an electronic motor.

Depending on the used speed and knife diameter, all kinds of materials can be cut with its rotary knife, this up to thickness of 5 mm.

The main focus is on single-layered textiles, certain types of fibre are hard to cut with other types of knives. Ideal materials to cut with the rotary knife are flag & banner material, felt, technical textiles, fabric, foams, ...0%

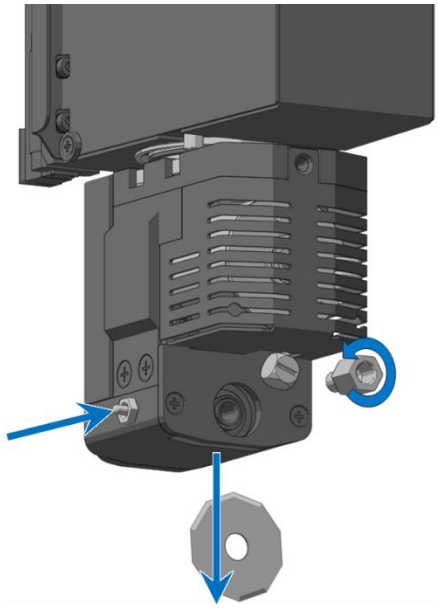
On the carriage, the module is installed in slot 3 but covers both slots 2 & 3 and. It requires dry compressed air and is connected with an electric connector to the central unit.

Knives must be mounted directly in the module; there are no tools available for this module.

The Rotary module includes the following:

1. Rotary module
2. Connection for compressed air for large and small tables
3. Knife Ø 28 mm
4. Wrench # 10 mm for blade change

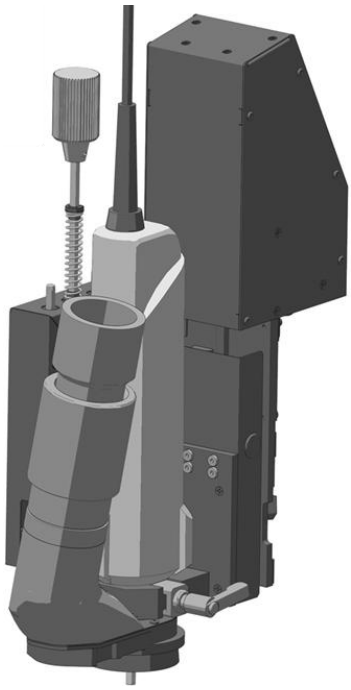
Change Blade



The complete module has to be taken from the machine to change the blade.

- Press the rotation lock pin to hold the blade
- Loosen and remove the nut with a wrench #10 mm.
- Replace the blade
- Put the nut back in place
- Press the rotation lock pin to hold the blade
- Fasten the nut with a wrench #10 mm.

5.4.2.3 Standard router module



The router module has a motor capable of handling most solid boards used in the graphic and sign industry.

To take away chips and dust, the router system comes with a vacuum cleaning kit. The kit includes a brush assembly, a hose and a mounting pole. The vacuum cleaner is optional.

The module allocates slot 2&3 of the head. The module can easily be dismounted and parked on the pole of the gantry, making the two slots available again.

Bits with Ø 3, 4, 6 and 8 mm can be mounted in the router.

ATTENTION: Use of a routing mat is mandatory.

The F Series router system includes following:

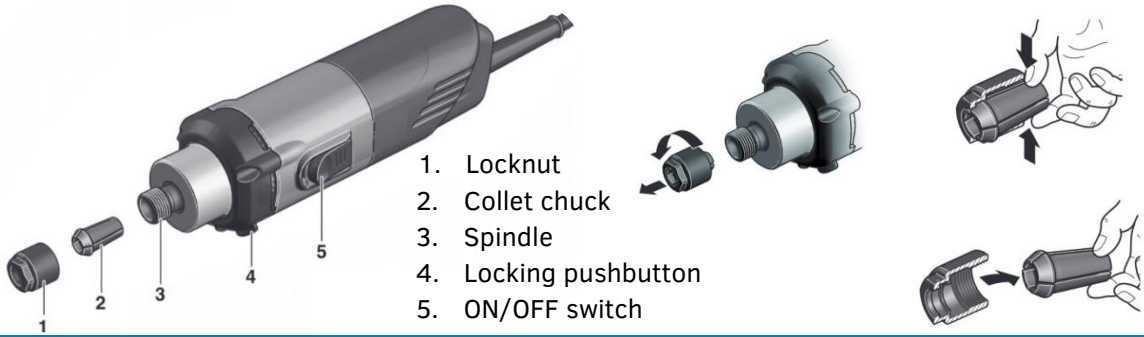
1. Routing module (with brush system)
2. Hoses and gantry
3. Switch for vacuum cleaner
4. Milling Motor
5. Set of collets
6. Universal bit to start with
7. Milling mat

Change the collet or bit

ATTENTION: Collet must be cleaned between every bitchange.

Turn the machine of or click “Change tool”. Remove the router from the module. Power cable to the router can be taken off. as well. Loosen the locknut (17mm wrench), take out the bit and twist it off completely. Squeeze the collet chuck and take it out the locknut. Use compressed air to clean the collet.

When putting the router back in the module, make sure the ON/OFF switch is on the handle side and secure it back in place.

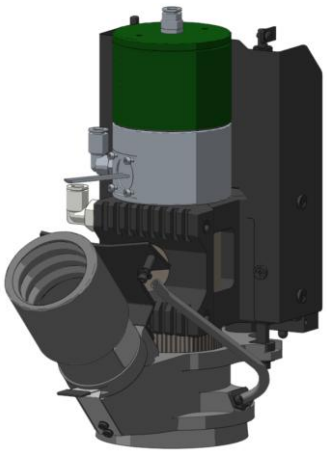


1. Locknut
2. Collet chuck
3. Spindle
4. Locking pushbutton
5. ON/OFF switch

ATTENTION:

- Don’t push the bit all the way in
- Don’t over tighten the locknut without a bit inserted
- Distance tip to collet must be minimum 15mm
- Don’t use a single bit for different materials, this affects cutting quality

5.4.2.4 High-Frequency router



The HF Routing Module features a high-frequency spindle with an increased power output up to 3.7kW, enabling higher processing speeds. The well-balanced high-frequency spindle ensures smooth and precise finishing on rigid materials. Changinghe routing bit is pneumatically controlled and is easily replaced. The brush assembly height is adjusted automatically.

ATTENTION:
Use of a routing mat and chiller is mandatory.

The F Series HF router system includes following:

1. Routing module (with brush system)
2. Hoses and gantry
3. Switch for vacuum cleaner
4. SycoTec Routing Motor
5. Power supply and motor driver
6. Collet: 6 mm
7. Universal bit (∅4mm)
8. Milling mat
9. Chiller

Chiller

The chiller, the recommended target temperature is the ambient temperature of its surroundings. This setpoint is preset and it's not recommended to be changed. To change this setpoint press the *"Set"* button and adjusted by using the arrow keys. Normal temperature ranges from 18°C to 25°C

When setting the temperature below the surrounding temperature (dewpoint), condensation forms and water damage may occur to the machine(s). When this happens, power off the machine immediately and check the chiller setting, wipe the affected areas dry and allow the water in the chiller to warm for 30 minutes above dewpoint before resuming.

ATTENTION:
Water temperature may not fall below dewpoint – Water damage is not warranted

Chiller Coolant

Cooling medium	Demineralized with 15% corrosion agent, e.g., glycol Hardness: 1-15°dH pH value: 7-9
Flow temperature	Max 25°C
Flow	Min. 0.5 l/min
Anti-corrosion agent	CLAIRIANT Antifrogen N / comparable anti-corrosion agent

Other types of cooling are possible (air or convection). The temperature at the housing of the spindle should not exceed 60°C. Lifetime of the ball bearings will be affected.

Remove a bit

- Click “Change Tool” or turn off the machine using the main switch.
- Flip the switch “ ”, releasing the router bit and remove it.

Install a bit

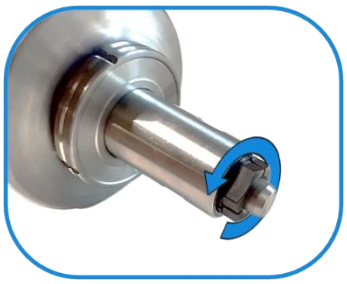
- Insert a bit or dummy bit into the collet.
- Flip the switch “ ”, clamping the bit firmly.
- Click “Resume” or turn on the machine.

5.4.2.4.1 REPLACING THE COLLET

WARNING:
Never close the collets without a (dummy) bit installed as this damages the collet.

The router is shipped with a dummy collet and has no insertion hole for the bit. On first installation, replace this with the 6 mm collet.

Remove the collet



- Click “Change Tool” or turn off the machine using the main switch.
- Remove the HF-router from the module and place it sideways, stable on the conveyor belt.
- Flip the switch “ ”, releasing the router bit and remove it.
- Twist the collet outwards to remove. If necessary, use the ring wrench.

Install the collet

- Put a clean collet in with a light film of oil on the thread and turn it in the spindle.
- Insert a bit or dummy bit into the collet.
- Tighten the collet using the ring wrench.
- Flip the switch “ ”, clamping the bit firmly.
- Put the spindle back into the router module.
- Click “Resume” or turn on the machine.

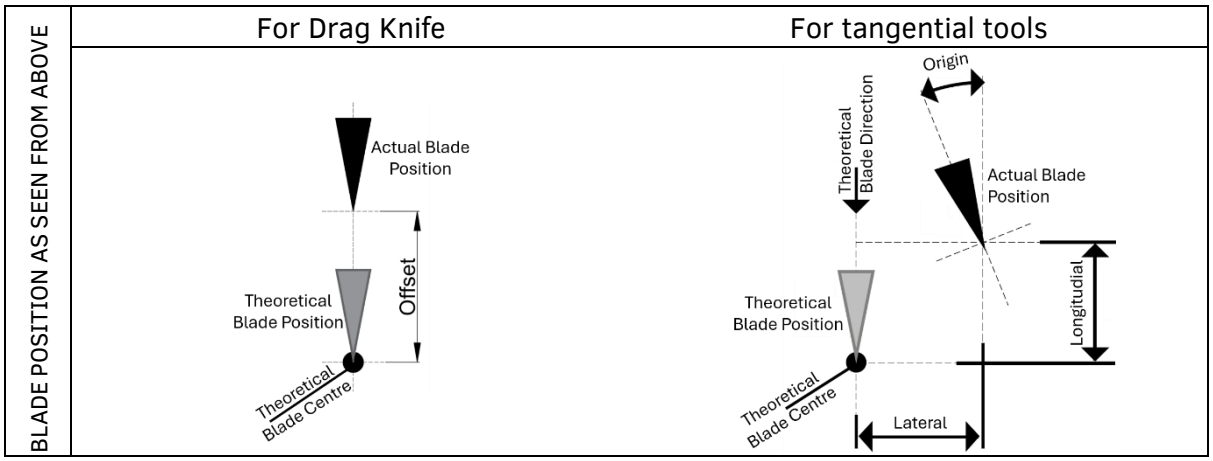
6 CALIBRATION OF TOOLS

6.1 General

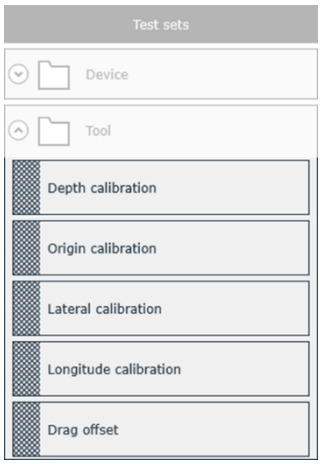
To ensure the best cutting quality, a tool must be calibrated. With the help of *GoCare* this can be achieved manually. Every machine has two ADC's which can do this fully automated. A tool is measured by the ADC after a tool is switched in, after an emergency stop or if an operator calls for it.

Following settings are calibrated:

(Drag) Offset	Setting is only used for drag knife. Factor for the offset for the blade along the cutting path. Wrong setting results in misalignment on the cutting lines, very visible in opposite cuts. Additionally, irregular bends could occur in corners.
Depth	Sets the tool-depth manual for the requested module position.
Origin	Factor to angle the blade with its direction of movement. Wrong setting results in an irregular bend in the start of a cutting line and ripping the media instead of creating a clean cutting.
Lateral	Factor for the offset for the blade alongside the cutting path. Wrong setting results in a parallel shift from the cutting line, noticeable when using the tool property "*avoid overcut*".
Longitudinal	Correction factor for the starting point of the cutting line. Wrong setting results in unclosed corners or unwanted overcut.



6.2 Manual Calibration



Manual calibrations are done with the use of *GoCare*.

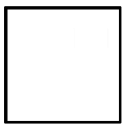
- Open *GoCare*
- Install the tool
- Click the test set *"Tool"* open
- Select the setting to start calibrating

All calibrations are done in factory by Summa, recalibration should not be necessary.

All calibrations must be done with vinyl. There must be a high colour contrast between the vinyl and backing, e.g. black vinyl with white

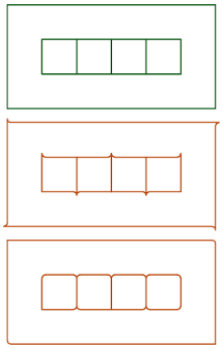
backing. It's recommended to calibrate the tangential module with the Kiss Cutting Tool.

6.2.1 Depth



If needed, put the blade beside the cutting material. This can be done within the calibration procedure. Change the blade depth by chosen increments, create a test cut by clicking the button and click *"Apply"* when done.

6.2.2 Offset (Drag Offset)



A test pattern of four in-line squares are cut. Weed out the outer rectangle and inspect the cut pattern. No squares should come with the weeding. Look if the squares have neat corners.

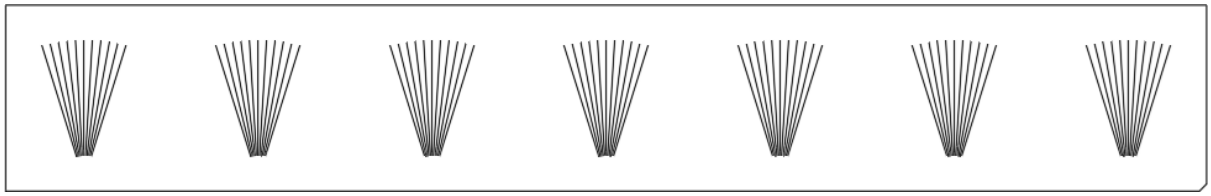
•Spiked corners, offset is too high

•Rounded corners, offset is too low

If needed, change the offset value in GoCare and recut until a nice pattern is cut.

6.2.3 Origin

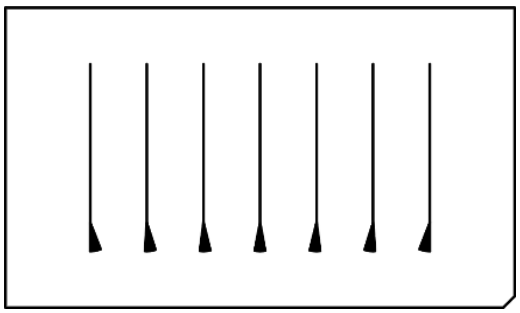
Kisscut Tool



Seven fan shaped patterns are cut, each with a different origin setting. A good fan shape has a clear middle line, lines at the sides gradually show burs. Inspect which pattern has the neatest cuts and select the corresponding fan in *GoCare*.

If needed, redo the calibration until you've chosen a pattern with a good fan shape.

Other tools



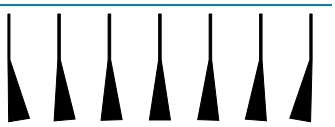
A pattern of seven vertical lines is cut, each with a different origin setting. Inspect the pattern and look at the beginning of each line.

A good origin setting is where the blade is pointed in the same direction as the line.

A bad origin setting is when the knife is pushed in under an angle and dragged into the cut direction. This may create burred cuts.

The straightest line (good origin) should be in the middle of the test lines. If needed, redo the calibration. until you've chosen a line with a good origin.

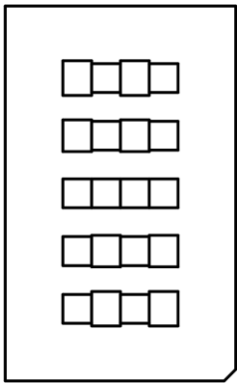
NOTE:
Use a magnifying glass to check the start of the line.



6.2.4 Lateral

ATTENTION:
Lateral cannot be set without a good origin.

Kisscut Tool

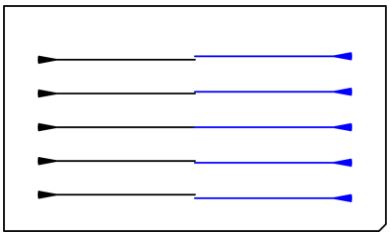


A pattern of in-line squares is cut, each with a different lateral offset. Inspect the cut patterns and look for the row of squares where the height of each square is the same as the next. In *GoCare*, select in the pattern that resembles this the best.

- When the first square is lager, lateral offset is too high.
- When the first square is smaller, lateral offset is too low
- When all squares are the same size, lateral offset is just right

If there is no line that's just right. Choose the best fit and redo the test until you've found the best row of squares.

Other tools



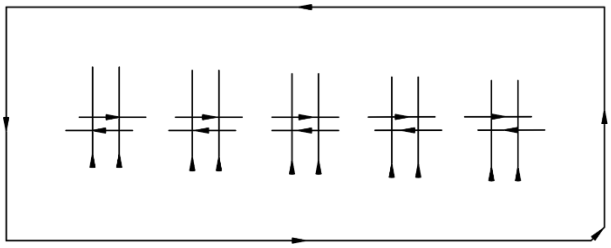
A pattern of five horizontal lines is cut, each with a different lateral offset coming from both directions. Inspect the patterns and look at the middle of each line and choose the best fit in *Gocare.*

A good lateral is where left and right half are in line

If there is no line that is just right. Choose the best fit and redo. until the correct cut is in the middle

6.2.5 Longitudinal

Hight torque rotary module

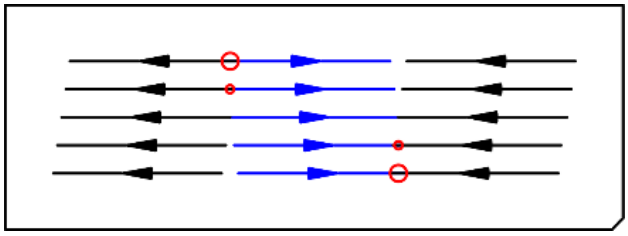


A pattern of five squares is cut, each with a different longitudinal offset. Inspect the pattern and look for the horizontal lines that have equal overcut

A good longitudinal creates the same overcut from left to right as from right to left

If there is no pattern that is just right. Choose the best fit and redo.

Others



A pattern of five three-segmented horizontal lines is cut, each with a different longitudinal offset. Inspect the segments and look for gaps or overlap in each line.

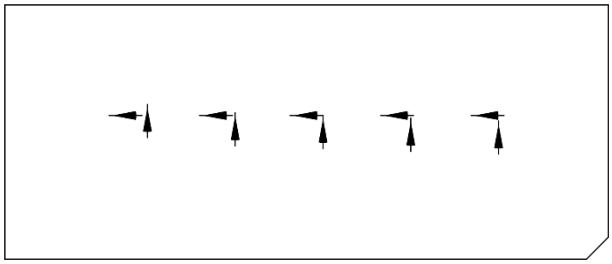
A good longitudinal creates no overlap between segments. Select in GoCare the line that best resembles this.

If there is no line that is just right. Choose the best fit and redo until the correct cut is in the middle.

Alternative

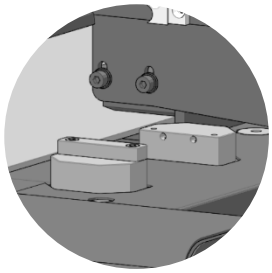
A pattern of five corners is cut, each with a different longitudinal offset. Inspect the pattern and look for where the lines form a neat corner without gaps.

If there is no pattern that is just right. Choose the best fit and redo.



6.3 Automatic Device Calibration

The Automated Device Calibration (ADC) simplifies tool, blade or bit calibrations significantly. The ADC measures the tip of the blade or bit accurately and sets the down position of the tool to the level of the conveyor. Tangential parameters can be measured with the ADC. This ensures the best settings are used to get the most optimal cut.



Left ADC is used to measure tools installed in module slot #1. The right ADC is used to measure tools installed in module slots #2 and #3. A drag knife module cannot be measured by the ADC.

6.3.1 Calibrating the Kiss Cutting Tool

Knife pressure is needed to pierce the material. It should not control the knife depth. Knife depth is controlled with the nosepiece.

- Knife depth is controlled by turning the small knob of the tool.
- Knife pressure is controlled by turning the big knob of the tool
- Remove the nosepiece before performing an ADC calibration.

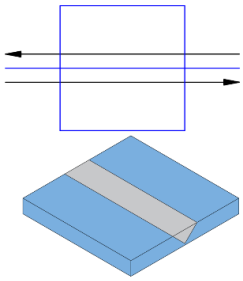
6.3.2 Calibrating the EOT – POT – POT-L

After an ADC calibration, check if it's possible to make a clean cut with the chosen job speed. If the cut is not through, you may want to set the down position offset lower and redo this check.

6.3.3 Calibrating the Corrugated Tool

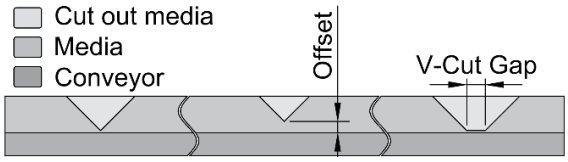
To calibrate the corrugated tool, install and turn the wheels to the maximum up position, making the blade stick out. Cutting depth is controlled by turning the wheels up or down. Set the wheels to a desired depth and test if this gives the desired result.

6.3.4 Calibrating V-Cut tools



The ADC only sets the down position of the blade and offsets it to 0,5mm from the conveyor. Setting a V-Cut is material dependant. The other blade parameters, origin, lateral and longitudinal need to be set manually. Calibrations are saved within the machine. When re-installing the V-Cut tool and cutting the same material (and thickness), there's no need for recalibration.

Check the V-Cut by cutting a single line with the V-Cut tool followed by a square made by any tool with a straight blade suitable for the chosen media. Take the square out and bend it lightly to verify the angle of the cut.



A lateral gap can be set with the tool property *"Gap"* within *"GoProduce"* – *"Tool properties"*

WARNING: Manual depth calibration must be done beside the cutting material. If not, the blade tip will break.

6.3.5 Calibrating the Perforating tool

The conveyor belt is not rigid enough to support perforation cuts through flexible or thin materials. It is recommended using a rigid, soft, porous underlay, e.g. MDF. Adjust property "*Underlay thickness"* in *"GoProduce"* – "*Working Area"* to the thickness of the underlay.

6.3.6 Calibrating the Rotary Module

After ADC calibration, check the cutting depth, different fabrics contain different fibres. If the fabric is not cut completely, adjust the tool property "*Down position offset"* (in the material manager).

6.3.7 Calibrating the routing bit with the ADC

Before the router can be used, procedure *"Calibrate tool to head camera"* must be performed using the software *"GoCare"*. When done correctly, the ADC will recognise the router for calibration.

During calibration a hole will be drilled and read by the camera. If the camera has trouble recognising the hole, highlight its edges with any marker for extra contrast.

Down position is set by the ADC. Up position is set 2mm higher than set material thickness. Brush hight is automatically set to the material thickness.

7 GOPRODUCE FLATBED EDITION

ATTENTION:
Start GoProduce then, switch on the machine

Summa GoProduce Flatbed Edition is software that integrates the flatbed cutting table into the production workflow. It connects the design computer, to the cutting device.

After the workflow is set up, macros automate the process, reducing the need for operator intervention and minimizing machine downtime.

7.1.1 Connect your device

Connect your computer to the machine using an ethernet-cable or ethernet-usb-cable.

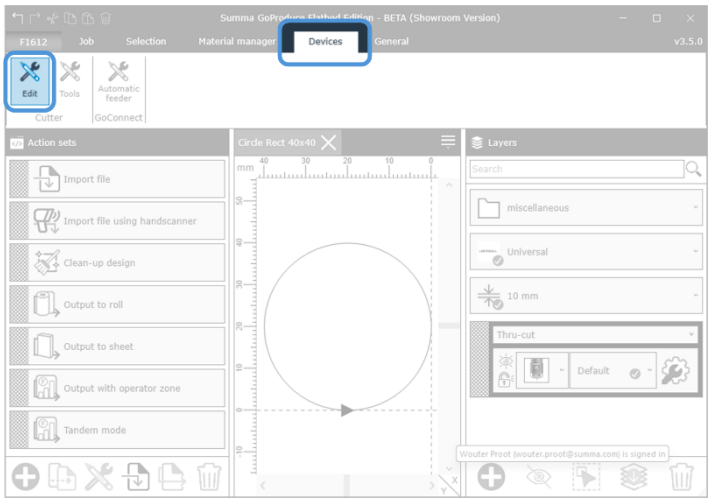
Conduct following on-screen clicks:

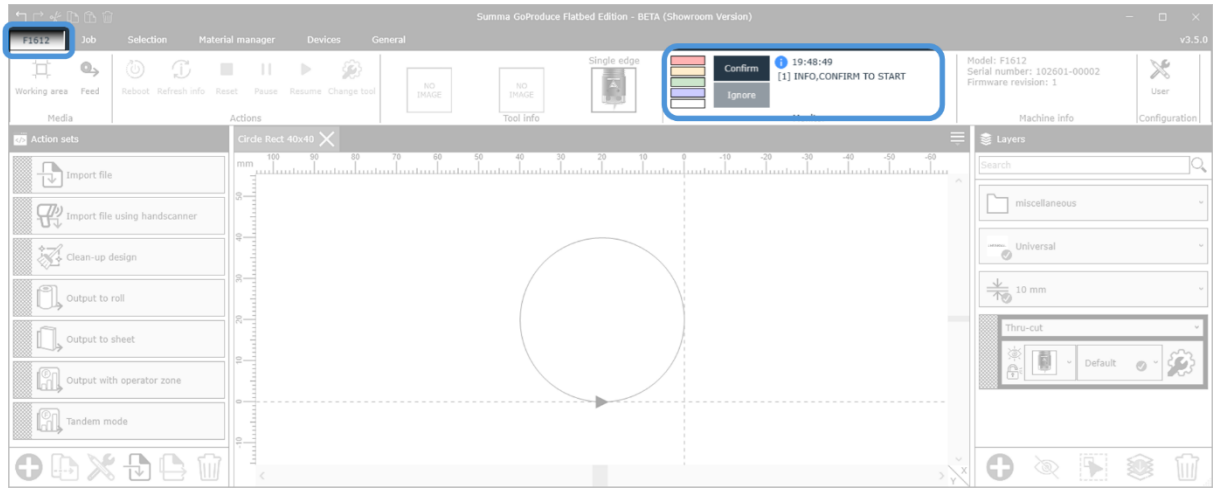
- Click *"Devices"* – *"Edit"*
- Select the device and confirm *"OK"*

If no device is shown, check if the machine is turned on and check the emergency buttons.

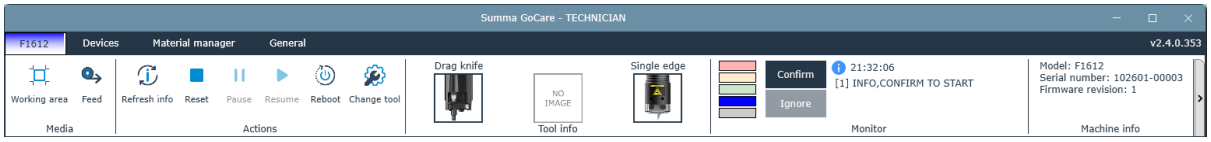
- Click *"Fxxxx"* and *"Confirm to start"*

  The LED strip turns green and the machine starts homing





7.2 Ribbon

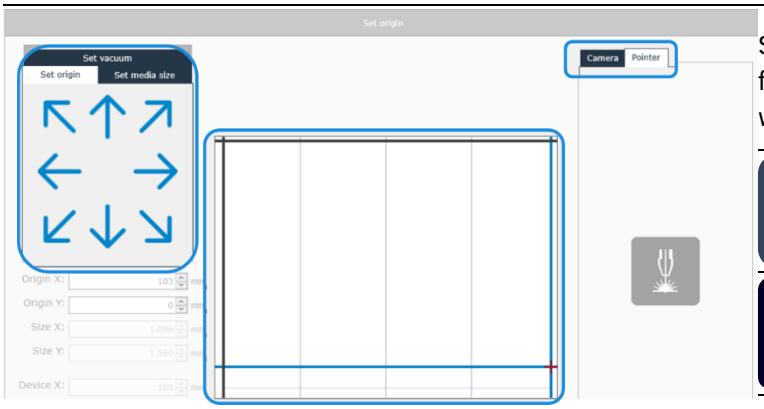


7.2.1 Working Area

The button *"Working area"* is used to set up media size. Vacuum zones are automatically set in accordance with the media size.

NOTE: The drag module in slot 1 can't pass over the ADC. To avoid collision, the front margin of the working area is moved 80 mm to the rear.

Set origin or size by using the arrows, filling in the fields or clicking into the white media area.



Set media size by using the arrows, filling in the fields or clicking into the white media area.

Click to activate camera

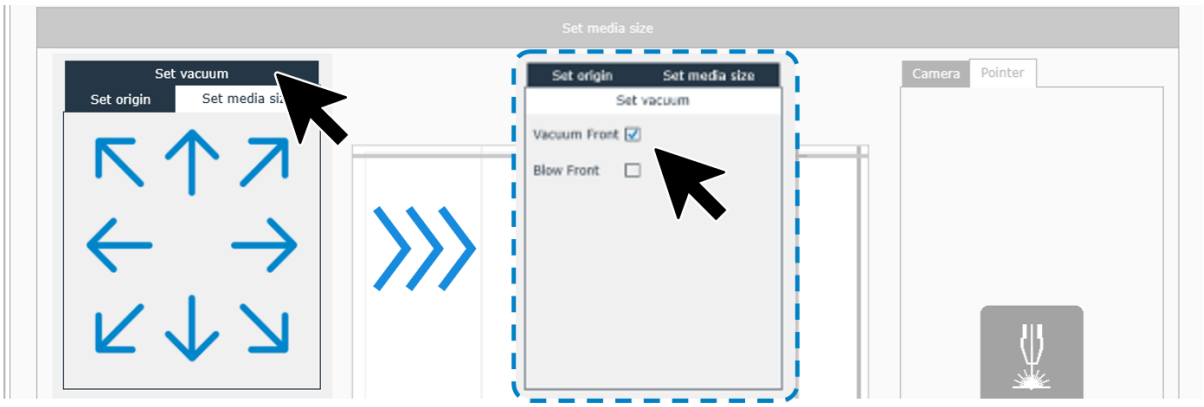
Click to activate laser pointe

Click *"Save"* to finish

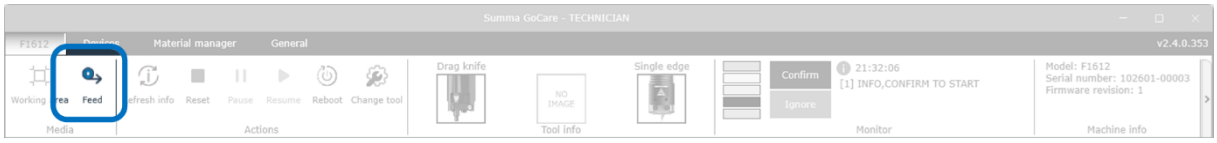
7.2.1.1 Underlay Thickness

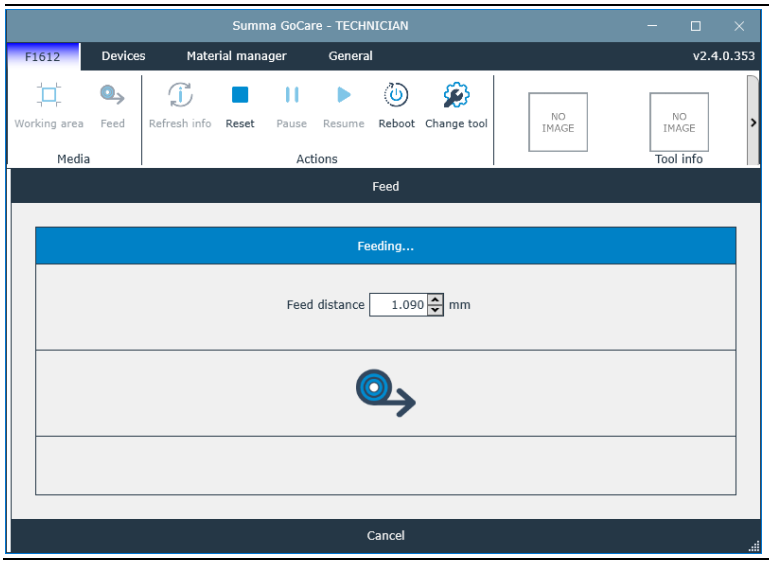
7.2.1.2 Vacuum control

Manually control the vacuum through the window of “Working Area” – “Set vacuum”.



7.2.2 Feed





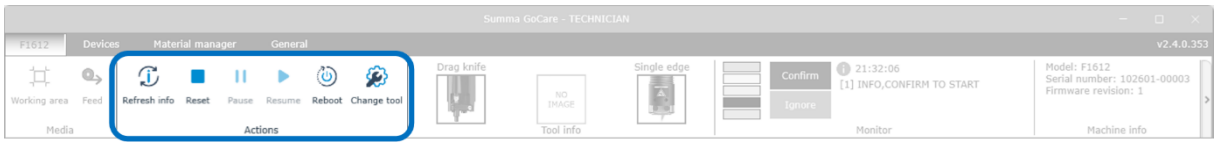
Enter the distance you want the conveyor to be fed

Click to start feeding

Max feed dist.: 50 000 mm

Click *“Cancel”* to leave

7.2.3 Actions



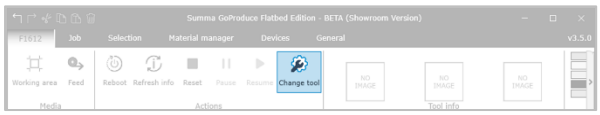
Refresh info	When no "Tool info" or Machine info is displayed, click this button	Resume	Resume after *"Pause"* or *"Change tool"*
Reset	Does the same as *"Cancel"* when possible	Change tool	Initiate Change tool
Pause	Wen the machine is cutting, pause the job		

7.2.4 Change tool

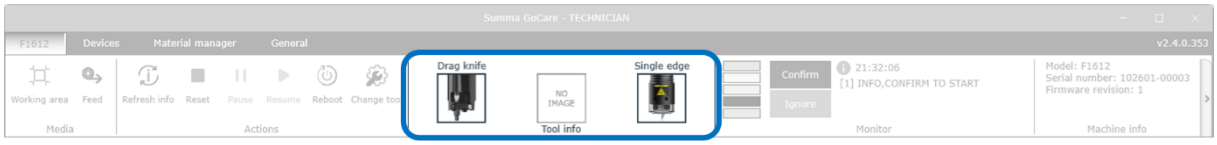
The change tool button must be used when a module or tool is changed on the flatbed. If a tool or module is changed without using the button, the machine will not detect the change. Using the machine or tool like this could damage it irreversibly.

Steps to install or remove a cutting tool or module:

- Click *"Change tool"* – Machine parks itself, LED strip turns from blue to green to yellow
- Perform the physical tool change
- Click *"Resume"* – Tool gets measured by the ADC, LED strip turns green, when finished to blue.

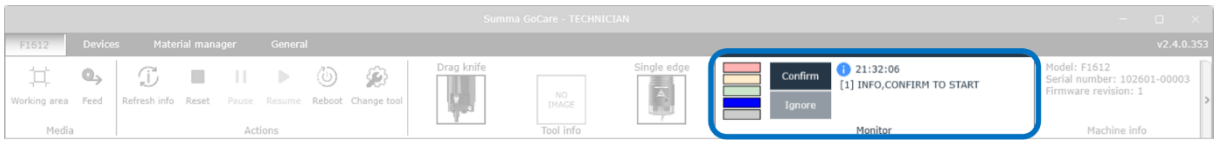


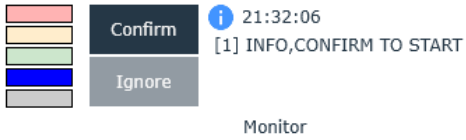
7.2.5 Tool info – Start ADC calibration



Drag knife / NO IMAGE / Single edge (Tool info)	Shows the installed tool on the machine Click the tool to initiate ADC tool calibration

7.2.6 Monitor



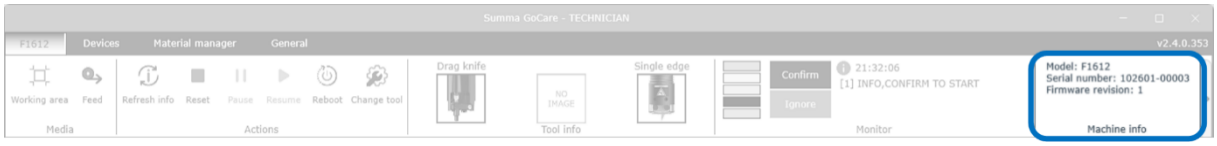


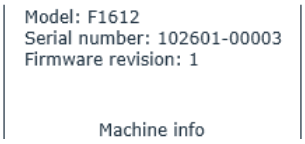
Shows the machine status colour

Gives information when action is needed to operate the machine

- Error, something unexpected happened – Safety tripped, activated or axis blocked, etc
- Machine is waiting for confirmation
- Machine is operating or moving
- Machine is idle and safe to approach
- Machine is waiting for *"Confirm to start"*

7.2.7 Machine info

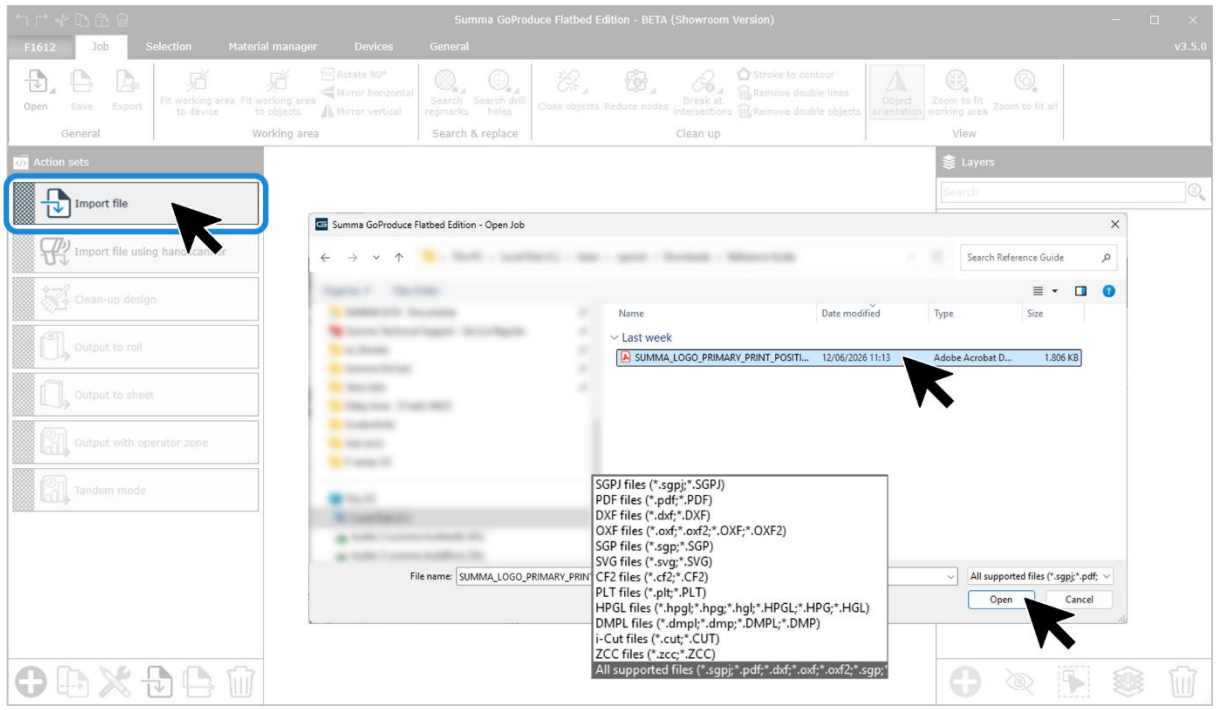




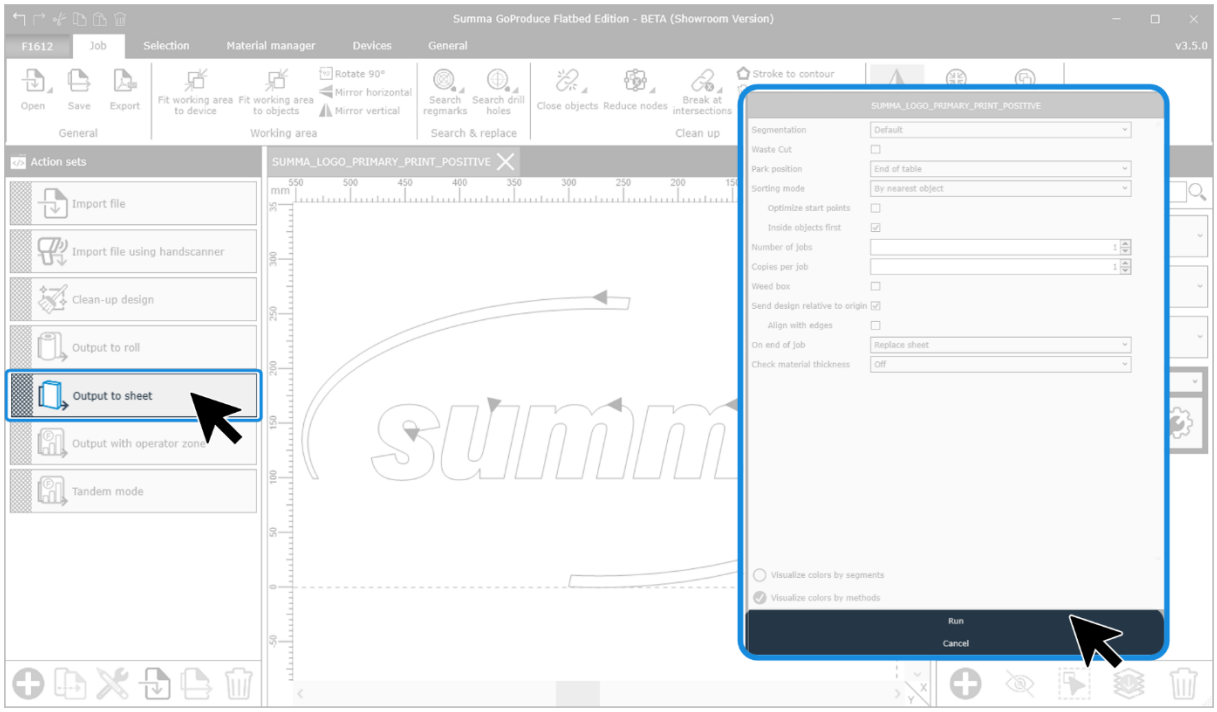
Shows machine information:

Model – Serial number – Firmware revision

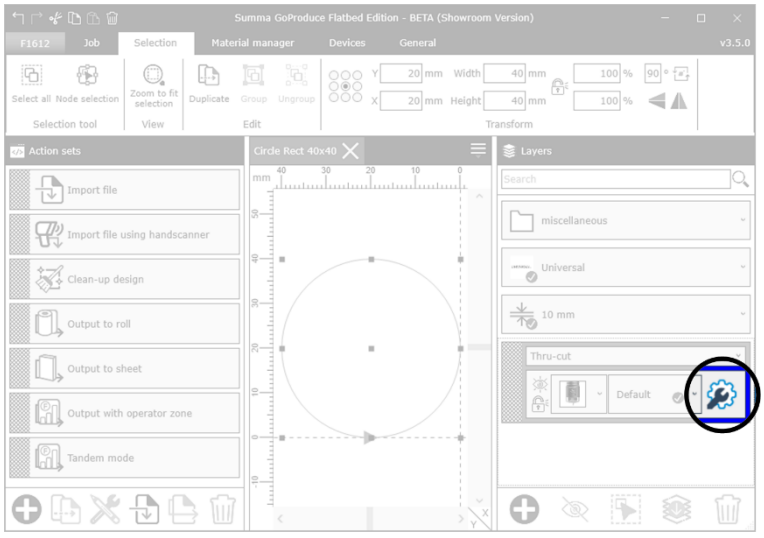
7.3 Import File



7.4 Output to sheet



7.5 GoProduce Tool properties

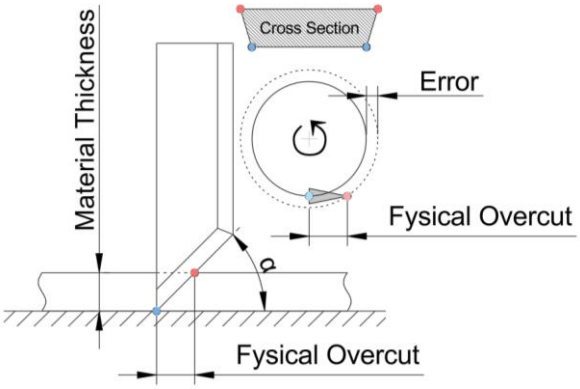


Speed	The speed the machine will use for the chosen tool or layer. Depending on the chosen tool, the maximum speed varies up to 1000 mm/s.
Down position offset	Position of the tip of the tool in relation to the conveyor of the machine. The conveyor is the zero-position and is set by the ADC. An offset can be set in tool properties using the *"GoProduce"*.
Up position offset	The offset distance from the media surface, by default 2mm. Adjustments can be done within the tool properties of *"GoProduce"*.
Add overcut	Each cut is extended by the set distance. Adding overcut makes weeding go smoother.

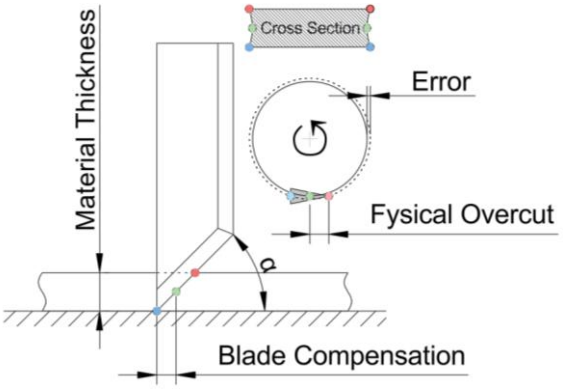
7.5.1 Blade Compensation

Cutting thicker materials, more than ±3 mm, creates a chamfer when cutting rounded contours. With blade compensation this error can be reduced significantly. Blade compensation as a longitudinal shift while cornering to reduce this error. If blade compensation is needed, using half of the material thickness works alright.

Without blade compensation



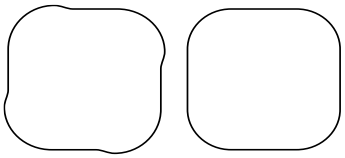
With blade compensation



Blade compensation is quantified in millimetres. The exact value is calculated as followed:

$$BC = \frac{t}{2}\cot(\alpha)$$

BC: Blade Compensation [mm] t: Material thickness [mm] α: Knife-angle with the table [°]



BLADE COMPENSATION

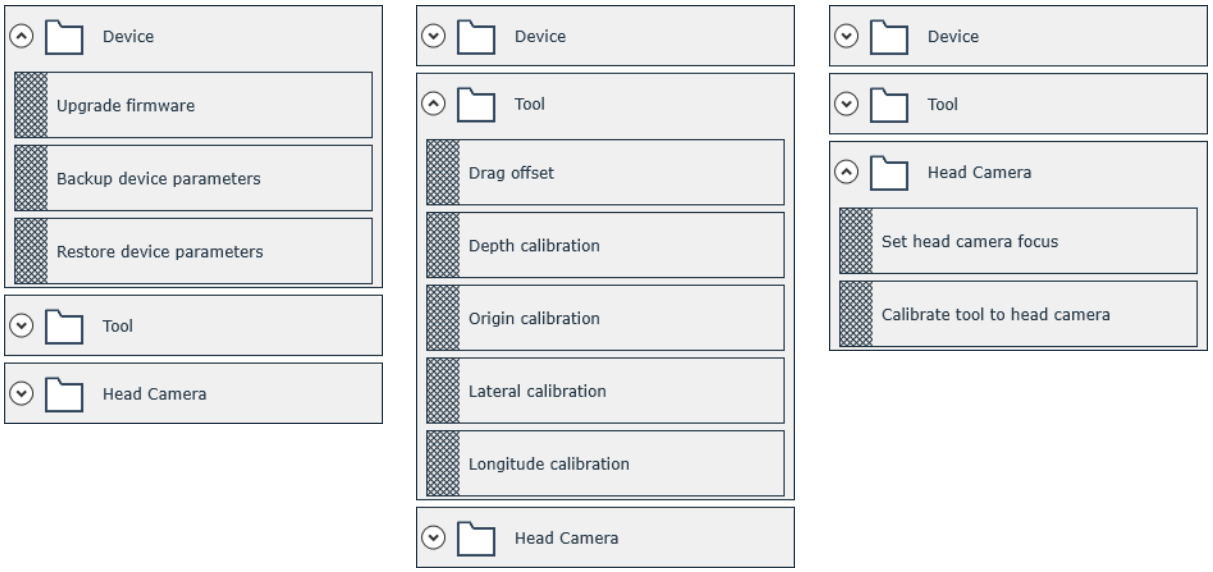
Thickness \ α	45°	50°	60°	65°	75°	80°	85°
3 mm	1,50 mm	1,26 mm	0,87 mm	0,70 mm	0,40 mm	0,26 mm	0,13 mm
5 mm	2,50 mm	2,10 mm	1,44 mm	1,17 mm	0,67 mm	0,44 mm	0,22 mm
8 mm	4,00 mm	3,36 mm	2,31 mm	1,87 mm	1,07 mm	0,71 mm	0,35 mm
10 mm	5,00 mm	4,20 mm	2,89 mm	2,33 mm	1,34 mm	0,88 mm	0,44 mm
12 mm	6,00 mm	5,03 mm	3,46 mm	2,80 mm	1,61 mm	1,06 mm	0,52 mm
16 mm	8,00 mm	6,71 mm	4,62 mm	3,73 mm	2,14 mm	1,41 mm	0,70 mm

8 GOCARE

GoCare is the software used to update the firmware, manually recalibrate tools (overwriting the ADC values) and recalibrate tool positions to the camera unit.

All calibrations are done in factory by Summa, recalibration should not be necessary.

All calibrations must be done with vinyl. There must be a high colour contrast between the vinyl and backing, e.g. black vinyl with white backing. It's recommended to calibrate the tangential module with the Kiss Cutting Tool.



Device

Upgrade firmware	Upgrade the firmware from a chosen directory. Latest firmware can be found on the summa website.
Backup device parameters	Takes a backup from the device parameters. This can be on a local drive, external drive or cloud environment. NOTE: It is advised to make a backup file just after installation of the machine.
Restore device parameters	Restores a previously taken backup.

Tool

Drag offset - Depth calibration - Origin calibration - Lateral calibration – Longitude calibration

Parameters are explained in chapter *"6.2 Manual Calibration"*.

Head Camera

Set head camera focus	Gives live feed of the camera installed in the central unit. When a new camera lens is installed, this is used to set the focus. Don't forget to set the camera height explained in chapter *"5.3 Central unit"*.
Calibrate tool to head camera	Calibrates the chosen tool to the camera, ensuring each tool or tool slot has the same origin. ATTENTION: Only perform this calibration if instructed by a Summa technician.

F SERIES

9 PLUG-INS

For easy workflow, plug-ins to add regmarks are available.

Plug-ins for MacOS are available on the summa website

All Plug-ins for Microsoft Windows are packaged in one executable and is available on the summa website. After completing the installation setup, plug-ins can be found via File Exlorer: “C:\Program Files (x86)\Summa GoProduce Tools”

- Illustrator (Microsoft Windows)
- Illustrator (MacOS)
- CorelDraw (Microsoft Windows)
- Inkscape (Microsoft Windows)

9.1 Illustrator (Microsoft Windows)

The extra menu (Summa GoProduce) under the file contains one sub menu.

If the sub menu is used, following things happen:

- The layer ‘Regmark’ is made the top layer. All objects in it are deleted and it is locked.
- All objects in all unlocked and visible layers under the Regmark layer are selected.
- The Regmark layer is unlocked.
- Registration marks (circles with Ø5mm) are put around the selected objects and an arrow is added to easily recognize the orientation. All these registration marks and the orientation mark are saved in the Regmark layer.
- The Regmark layer is locked.

In order to prepare a file for Summa GoProduce do following:

- Make the layer(s) with the print data on it temporarily a template layer.
- Save file as pdf file (minimum pdf version 1.5). Make sure the option to save layers is on.
- Set property of print data layer again normal.

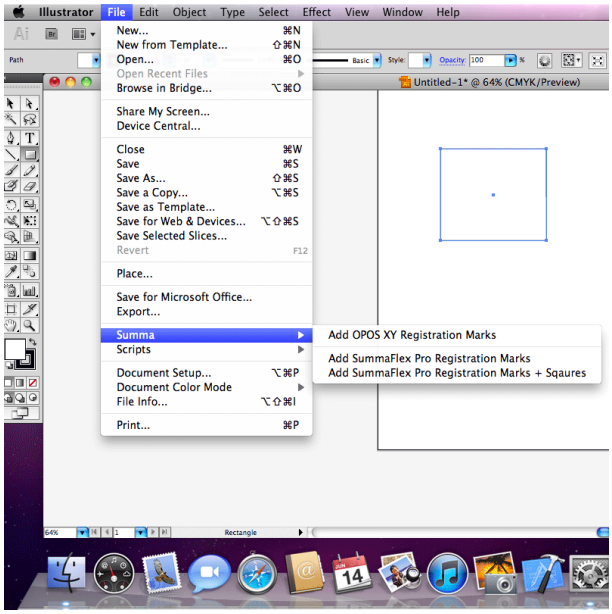
NOTE: The same can be done when saving det print data, just change the properties of the layers with cut data temporarily to template.

9.2 Illustrator (MacOS)

Plug in for MacOS is supported from CS4 up.

With this plug-in Summa GoProduce regmarks can be set. The Summa menu is added in the File menu of Illustrator.

Illustrator	Plug-in
CS4 & CS5	SummaCS4mac.aip Version 1.0.0.0
CS6	SummaCS6mac.aip
Illustrator CC	SummaCCmac.aip



9.3 Corel (Microsoft Windows)

The plug-in adds three new buttons to Corel.

Start a new drawing:

Button Action

- Start a new drawing from the F Series template.
- Create Summa layers and set the working area to 1200mm x 1600mm (portrait).
- The active layer is the layer for print data.

Add regmarks:

Button Action

- "Regmark" becomes the top layer - Delete all objects on Regmark layer
- Lock Regmark layer.
- Select objects on visible, unlocked layers
- Unlock Regmark layer.
- Add orientation arrow and regmarks (Ø5) on Regmark layer.
- Lock Regmark layer.

Create PDF-file ready for import to GoProduce:

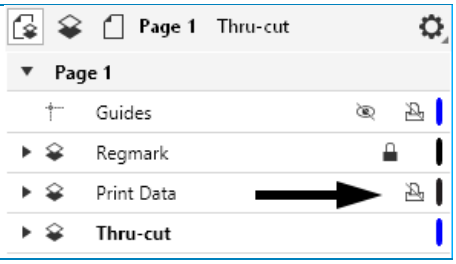
Button Action

- Select all objects in unlocked layers or where "printing / exporting" is enabled
- A *"Save"* dialogue box is opened – Set the preferred directory and filename.
- Click *"Save"* without changing any options

NOTE:

Disable printing of "Print Data" before saving the pdf file.

This would create too much data to import in GoProduce



10 MAINTENANCE AND CLEANING

All sliding surfaces require no lubrication by the operator. However, they collect dust and lint that may affect the cutter's performance. Keep the machine clean and use a cover when not in use. When necessary, clean the unit with a soft cloth, dampened with isopropyl alcohol or mild detergent. Do not use abrasives.

Check the blades on a regular basis, replace if the tip is worn down or broken off.

Machine-time operated is internally monitored by the machine. A service message will appear when maintenance is needed. Please take contact with a Summa certified technician. Service maintenance is mandatory, if not cutting quality and the lifetime are affected. Service maintenance is described in the service manual.

Daily and periodic maintenance is done by the operator.

WARNING: For safety reasons, always switch off the machine before inspection

10.1 Daily maintenance

- General visual inspection of possible damage to the machine
- Before booting up the machine, move the conveyor manually about 1 meter.
- Remove any dust and particles from previous jobs
- Check if the laser beam, bumpers and emergency stops still work as intended

10.2 Periodic maintenance

The frequency of periodic maintenance depends on how often the machine is used, varying from weekly to monthly. Maintenance actions are mostly triggered by a visual inspection of the machine or by having poor cut quality. It is recommended to do a complete visual inspection of the machine and its components once a week.

10.2.1 Cleaning the nose piece (Kiss Cutting Tool)

The nose piece may accumulate residue from the vinyl that will result in poor cut quality. The typical indication of a dirty nose piece is an interruption of the cutting line every 12 mm (0.5").

Cleaning the nose piece:

- Remove the Kiss Cutting Tool from the module.
  Use the *"Change tool"* button in the software.
- Observe the orientation of the nose piece in the tool and take it off .
- Remove any remaining vinyl residue, using a brush or a pair of tweezers.
- Put the nose piece back.
- Install the Kiss Cutting Tool back in the module.

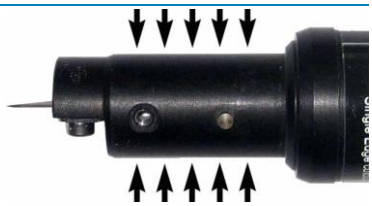
10.2.2 Cleaning the gliding disk (Cutout and EOT)

The gliding disk may accumulate residue from the vinyl causing poor cut quality.

Cleaning the gliding disk:

- Remove the Single Edge, Double Edge Tool or EOT from the module.
  Use the “Change tool” button in the software.
- Remove any remaining vinyl residue, using a brush or a pair of tweezers.
  Remove the gliding disk from the tool, if necessary.
- Install the tool again in the module, with the gliding disk.

NOTE: The gliding surfaces may be lubricated with a dry Teflon spray before the gliding disk is set back on the tool.



10.2.3 Cleaning the conveyor belt

Over time, dust and cut particles gathers in the conveyor. This reduces the vacuum, causing in poor cutting quality.

- Set the vacuum pump on “Blow”
- Clean the conveyor with a vacuum cleaner.

10.2.4 Cleaning the protection brushes at the sides

The brushes at the sides can accumulate dust. Use a vacuum cleaner to clean them. Do not use compressed air, since this will blow all the dust inside the machine.

10.2.5 Cleaning Guide rails

The guide rails don’t need lubrication it carries a built-in reservoir.

- Wipe the rails with a lint-free rag, wiping away from the carriage.
- Dampen a second lint-free rag with bearing lubricant (e.g.: NLGI 2 multipurpose grease) and wipe the rails , wiping aways from the carriage.

10.2.6 Cleaning the ADC

Over time the lenses of the fibre optic cables become dirty, interfering the accuracy of the ADC measurements. Following methods can be used the clean the PMMA lenses.

- For dust, a short burst of dry compressed air is enough.
- Filth clogging the lens, use a lint-free cloth dampened with warm water.
- Dirty ADC, clean it with a mixture of washing liquid, water and use a microfiber cloth. Dry the ADC with a dry lint-free cloth, do not apply pressure. Applying pressure may scratch the lens.

10.2.7 Replacing the knife guide of the EOT

High frequency movements of the EOT wears out the tool. The only part which can be replaced is the knife guide. If other parts are worn out, the EOT needs to be serviced at the Summa service center.

Replacing the knife guide:

- Remove the gliding disk and knife.
- Loosen the knife guide by removing the two setscrews.
- Put the setscrews into the threaded holes next to their original position.
- Carefully pull the setscrews and remove the knife guide
- Install the new knife guide, turn the setscrews in and put the gliding disk back on.

10.2.8 Emptying the compressed air filter on machines without a POT

Check the filter regularly:

- Remove the front cover, fastened with two screws.
- Check the filter, empty if needed

10.2.9 Filling up oil supply on machines with a POT

Check the oil-level monthly. When the level is below half, add oil.

10.2.10 Cleaning collet of the standard router

Each time a bit is removed or replaced, the collet needs to be cleaned. Clean the collet by tapping it gently on a flat service and blow the dust out of the grooves and thread, in nut and on router.

WARNING: A clogged collet does not grip the bit secure. During operation this could damage to the machine or cause injury.

10.2.11 Maintenance HF router

Run- in Cycle

When the HF-router is installed, a prompt may appear in *"GoProduce"* that calls for a run-in. The option "Cancel" is given, but the HF-router will be disabled until the run-in has been completed. When the prompt is confirmed, the cycle will be completed within a timeframe depending on to its last use.

11 OPTIONS & ACCESSORIES

11.1 Options

Item	Item Description	F1612-52	F1625-52	F1612-51	F1625-51	F1612-53
Electrical Wiring Options						
500-9230	Factory Installed 3x230V (3 Phase)	■	■	▢	▢	▢
500-9231	Field change kit 3x400V+N to 3x230V	■	■	▢	▢	▢
500-9239	Factory Installed 3x400V+N 60Hz	■	■	▢	▢	▢
Mats & Belts						
500-9114	Conveyor Belt Kit	■	▢	■	▢	■
500-9115	Protective Mat	■	▢	■	▢	■
500-9118	Extended Conveyor Belt Kit	■	▢	■	▢	■
500-9134	Conveyor Belt Kit	▢	■	▢	■	▢
500-9137	Protective Mat	▢	■	▢	■	▢
500-9333	Routing Mat 1.54m	■	■	■	■	■
500-9336	Routing Mat 1.3m	■	■	■	■	■
Media Handling Options						
500-9422	For use with F16xx & Board Feeders	■	■	■	■	■
500-9416	For rolls up to 200 Kg or 400 lbs	■	■	■	■	■
500-9146	Conveyor Front Extension	■	■	■	■	■
500-9120	Media Basket 160 cm	■	■	■	■	■
500-9121	Sturdy Folding Extension Table	■	■	■	■	■
500-9425	Sheet feed 75 for F16xx bundle • 500-3475: Sheet feeder F16xx • 500-9422: Leveling kit F16xx • 500-9423: Summa GoConnect sheet feed license • 500-9424: Connection kit	■	■	■	■	■
Miscellaneous Options						
500-9345	Hercules 3000W Vacuum Cleaner	■	■	▢	▢	▢
500-9365	Mezzo Vacuum Cleaner 76	■	■	■	■	■
Modules						
500-9541	Standard Router System F1612-5X • 1400W Milling Motor & Module, Collets: 3, 4, 6 ,8 mm & 1/4 inch, • Electronics, cables and hoses • Gantry F1612-5X • Routing mat	■	▢	■	▢	■
500-9542	Standard Router System F1625-5X • 1400W Milling Motor & Module, Collets: 3, 4, 6 ,8 mm & 1/4 inch, • Electronics, cables and hoses • Gantry F1625-5X • Routing mat	▢	■	▢	■	▢
500-9545	3.7kW HF Router System F1612-5X • Routing module, 3.7kW SycoTec Milling Motor, Collet: 6 mm, • Electronics, cables and hoses specific for HF-router F1612-5X • Gantry F1612-5X • Routing Mat • Chiller	■	▢	■	▢	■
500-9546	3.7kW HF Router System F1625-5X • Routing module, 3.7kW SycoTec Milling Motor, Collet: 6 mm, • Electronics, cables and hoses specific for HF-router F1625-5X • Gantry F1625-5X • Routing Mat • Chiller	▢	■	▢	■	▢
500-9560	F-series Drag Mod SMART+ • Standard drag knife holder dia. 1.5 mm • Drag knife 36° Ø1.5, offset 0.45 mm • Roller pen black	■	■	■	■	■
500-9561	Core+ Module	■	■	■	■	■
500-9562	Fast+ Module	■	■	■	■	■
500-9563	Rotary Module	■	■	■	■	■
Software						
500-9514	Dealer Version	■	■	■	■	■
500-9511	Summa GoProduce	■	■	■	■	■
500-9515	GoProduce Update 2.x to 3.x	■	■	■	■	■
500-9517	GoProduce Update 1.x to 3.x	■	■	■	■	■
500-9513	GoProduce Pro Pack	■	■	■	■	■
500-9423	License for board feeders	■	■	■	■	■

11.2 Consumables and Accessories

F Series Vantage - Consumables and Accessories	
Consumables and Accessories for Drag Module	
391-231	DRAG KNIFE 60° DIA:1.5 MM - OFFSET:0.50 MM (1X)
391-358	DRAG KNIFE 55° DIA:2.0 MM - OFFSET:0.90 MM (5X)
391-363	DRAG KNIFE HOLDER (COPPER) DIA:2.0 MM - For SANDBLAST KNIVES #391-358
395-430	ROLLER BALL BLACK (5 PIECES)
395-434	UNIVERSAL PENHOLDERS (2 types) for DRAG HEAD
395-438	FIBER PEN BLACK (5 PIECES)
9TL89-67033	STANDARD DRAG KNIFE HOLDER DIA:1.5 MM
9TL89-67041	STANDARD DRAG KNIFE 36° DIA:1.5 MM - OFFSET:0.45 MM (5X)
Consumables and Accessories for Rotary Module	
500-9860	DECAGONAL KNIFE D25 (3X) * tool: Rotary Module [500-9360]
500-9861	DECAGONAL KNIFE D28 (3X) * tool: Rotary Module [500-9360]
500-9862	DECAGONAL KNIFE D32 (3X) * tool: Rotary Module [500-9360]
Consumables and Accessories for Routing Module	
500-0355	3MM COLLET FOR 1400 FME
500-0356	4MM COLLET FOR 1400 FME
500-0357	6MM COLLET FOR 1400 FME
500-0358	6-35MM COLLET FOR 1400 FME-P
500-0359	8MM COLLET FOR 1400 FME-P
500-9365	Mezzovac 76 - Vacuum Cleaner
500-9850	BIT D3/3 L38/11 1FL UC MP (3X)
500-9852	BIT D4/4 L50/12 1FL UC MP (3X)
500-9854	BIT D6/3 L50/06 1FL UC MP (3X)
500-9856	BIT D6/4 L50/12 1FL UC MP (3X)
500-9857	BIT D6/6 L50/12 1FL UC BAL MP (3X)
500-9858	BIT D6/6 L58/22 1FL UC BAL MP (3X)
500-9859	D6/6 L50/14 POLISHING
500-9863	BIT D6/10 L50/6 V GROOVE 2FL 90° (2X)
500-9864	BIT D6/6 L50/22 2FL UC/DC (2X)
500-9865	BIT D6/6 L50/12 1FL UC BAL CT (3X)
500-9866	BIT D6/3 L50/11 1FL DC MP (3X)
500-9867	BIT D6/3 L50/6 1FL UC CT MP (3X)
500-9868	BIT D6/4 L50/12 1FL UC CT MP (3X)
500-9869	BIT D6/2 L50/6 1FL UC CT MP (3X)
500-9870	BIT D6/4 L50/6 1FL UC CT MP (3X)
500-9872	BIT D3/3 L38/6 1FL UC MP (3X)
500-9873	BIT D4/4 L50/6 1FL UC MP (3X)
500-9874	BIT D4/4 L50/14 1FL UC MP (3X)
500-9875	BIT D6/2 L50/6 1FL UC MP (3X)
500-9876	BIT D6/3 L50/11 1FL UC MP (3X)
500-9877	BIT D6/4 L50/6 1FL UC MP (3X)
500-9878	BIT D6/6 L50/12 1FL UC MP (3X)
500-9879	BIT D6/3 L50/6 1FL DC MP (3X)
500-9880	BIT D6/4 L50/12 1FL DC MP (3X)
500-9881	BIT D6/6 L50/12 1FL DC MP (3X)
500-9882	BIT D6/2 L50/6 1FL UC A (3X)
500-9883	BIT D6/3 L50/6 1FL UC A (3X)
500-9884	BIT D6/3 L50/11 1FL UC A (3X)
500-9885	BIT D6/4 L50/8 1FL UC A (3X)
500-9886	BIT D6/4 L50/12 1FL UC A (3X)
500-9887	BIT D6/6 L50/12 1FL UC BAL A (3X)
500-9888	BIT D6/6 L58/22 1FL UC BAL A (3X)
500-9889	D6/4 L60/14 1FL UC DLC (1x) - Great for Aluminium Alloys
Consumables and Accessories for Tangential Tools	
390-534	STANDARD TANGENTIAL KNIFE 36° (5X)
390-550	TANG KNIFE 60° SANDBLAST
390-551	TANG DOUBLE TIP KNIFE 36°
390-553	TANGENTIAL KNIFE INSTALL TOOL
390-560	TANG KNIFE 45°, WEDGE 40/25°
395-348	NOSE PIECE, STANDARD
500-0140	1 set of foam seals for POT Mk2
500-3318	DEPHT ADJUST KISSCUT KNIFE HOLDER
500-9800	KNIFE OT L25 65° * up to 5 mm thick material * tool holder: [500-9320]
500-9801	SINGLE EDGE CUTOUT KNIFE 65° * up to 6mm thick material * tool holder: [500-9312]
500-9802	DOUBLE EDGE CUTOUT KNIFE 50° * up to 3 mm thick material * tool holder: [500-9313]

500-9803	DOUBLE EDGE CUTOUT KNIFE 60° * up to 5 mm thick material * tool holder: [500-9313]
500-9804	DOUBLE EDGE CUTOUT KNIFE 50° BURR-FREE (2X) * up to 3 mm thick material * tool holder: [500-9313]
500-9807	HEAVY DUTY CUTOUT KNIFE 45°/90° * up to 15 mm thick material * tool holder: [500-9314]
500-9810	KNIFE OT L25 / 65°-80° * up to 11 mm thick material * up to 5mm thick material with gliding disk * tool holder: [500-9320]
500-9811	KNIFE OT L25 / 65°-85° * up to 11 mm thick material * up to 5 mm thick material with gliding disk * tool holder: [500-9320]
500-9812	KNIFE OT L28 / 65°-85° * up to 14 mm thick material * up to 8 mm thick material with gliding disk * tool holder: [500-9320]
500-9813	KNIFE OT L25 / 0°-65° * up to 6 mm thick material * up to 5 mm thick material with gliding disk * tool holder: [500-9320]
500-9814	KNIFE OT L38 / 45°-86° * up to 24 mm thick material * up to 18 mm thick material with gliding disk * tool holder: [500-9320]2
500-9815	KNIFE OT L33 / 45°-85° * up to 19 mm thick material * up to 13 mm thick material with gliding disk * tool holder: [500-9320]
500-9820	50° Symmetrical Coated knife up to 5 mm for #500-9321 Corrugated Tool
500-9821	65° Symmetrical Coated knife up to 8 mm for #500-9321 Corrugated Tool
500-9823	PRECISION CUTOUT BLADE 60°
500-9824	PRECISION CUTOUT BLADE 70°
500-9825	V-CUT BLADE 0.9MM (5X)
500-9826	V-CUT BLADE HARD METAL
500-9827	Burr-free BevelCut knife * For tool holder [500-9316]
500-9829	Symmetrical BevelCut knife * For tool holder [500-9316]
500-9830	POT KNIFE FLAT POINT L20 T0.63 (X3) * tool: POT [500-9350]
500-9831	POT KNIFE FLAT POINT L27 T0.63 (3X) * tool: POT [500-9350]
500-9832	POT KNIFE FLAT POINT L20 T1.5 (3X) * tool: POT [500-9350]
500-9833	POT KNIFE SERRATED FLAT POINT L27 T1 (X3) * tool: POT [500-9350]
500-9834	POT KNIFE L20 T1 (3X) * tool: POT [500-9350] * recommended: use only with extra protection mat!
500-9835	POT-L KNIFE L50 T1.0 (3X) * tool: POT-L [500-9358]
500-9837	RIGID CUTOUT BLADE D8 45/90
500-9890	PERFORATION KNIFE 1X1 mm D1.1 mm (12TPI)
500-9891	PERFORATION KNIFE 1.7X1.7 mm D1.1 mm (8TPI)
500-9892	PERFORATION KNIFE 3X3 mm D4 mm (4TPI)
500-9893	PERFORATION KNIFE 5X5 mm D4 mm (3PTI)
500-9894	POT KNIFE FLAT POINT CL 20 T0.7 (X1)
500-9895	POT KNIFE FLAT POINT CL 27 T0.7 (X1)
500-9896	POT KNIFE SERRATED CL27 (X1)
500-9897	POT KNIFE FLAT POINT CL20 T0.8 (X1)
500-9898	POT KNIFE FLAT POINT CL20 T1.5 (X1)
Tools for Tangential Module	
500-9311	KISS CUTTING TOOL * springs: Up to 120 (1x), 650 (1x) and 1800gr (1x) * standard nose piece (395-348) * standard tangential knife (includes 1 knife) [set of 5: 390-534]
500-9312	SINGLE EDGE CUTOUT TOOL - with gliding disk * Single Edge Cutout blade 65° (1x) [500-9801]
500-9313	DOUBLE EDGE CUTOUT TOOL - with gliding disk * Double Edge Cutout blade 50° (1x) [500-9802] * Double Edge Cutout blade 60° (1x) [500-9803]
500-9314	HEAVY DUTY CUTOUT TOOL * Heavy Duty Cutout blade 45°/90° (1x) [500-9807]

500-9315	PERFORATING TOOL * 3 Knives: [500-9891] & [500-9892] & [500-9893]
500-9316	BEVEL CUT TOOL * 1 x Bevel cut knife (1 knife) [500-9829]
500-9317	High Precision CutOut Tool * 1 x Precision Cut Out Blade (1 blade) [500-9823]
500-9318	Rigid Material CutOut Tool * 1 x Rigid Cut Out Blade 45/90 (1 blade) [500-9837]
500-9320	ELECTRONIC OSCILLATING TOOL * Stroke : 1 mm * 1 x KNIFE OT L25 65°-85° [500-9811] * Requires: regular service maintenance * Recommended: set of two
500-9321	CORRUGATED TOOL * including 1x [500-9820] coated knife * 2 compression wheels
500-9324	CREASE TOOL D50 R1.5 H0.6
500-9325	CREASING TOOL D25 R3 W8 H7
500-9326	CREASING TOOL D25 R1.5 W8 H5.5
500-9327	CREASING TOOL D25 R0.75 W1.5 H1.5
500-9328	CREASING TOOL D15 R0.35 W0.7 H1 - 2PT
500-9329	CREASING TOOL D15 H1.5 - 1PT
500-9340	V-CUT TOOL 0° * 1 set of 5 V-Cut blades 0.9 mm [500-9825] * 1 hard metal v-cut blade [500-9826]
500-9341	V-CUT TOOL 15° * 1 set of 5 V-Cut blades 0.9 mm [500-9825] * 1 hard metal v-cut blade [500-9826]
500-9342	V-CUT TOOL 22.5° * 1 set of 5 V-Cut blades 0.9 mm [500-9825] * 1 hard metal v-cut blade [500-9826]
500-9343	V-CUT TOOL 30° * 1 set of 5 V-Cut blades 0.9mm [500-9825] * 1 hard metal V-Cut blade [500-9826]
500-9344	V-CUT TOOL 45° * 1 set of 5 V-Cut blades 0.9mm [500-9825] * 1 hard metal V-Cut blade [500-9826]
500-9366	PNEUMATIC OSCILLATING TOOL Mk2 (POT) * 1 x [500-9894] KNIFE POT Flat Point L44.5 T0.7 * Requires: Dry & high volume compressed air.
500-9367	PNEUMATIC OSCILLATING TOOL - LONG Mk2 (POT-L) * 1 x KNIFE POT-L L50 T1 (1knife) [3pc:500-9835] * Requires: Dry & high volume compressed air. * Maximum material thickness: 42mm / 1.67" * Can only be used with 50mm long knives!

12 CERTIFICATES

The F-Series Vantage Flatbed Cutter fulfils all the relevant provisions of the applicable legislation:

- 2006/42/EC on machinery
- 2014/30/EU on electromagnetic compatibility
- 2011/65/EU + (EU) 2015/863

On the restriction of the use of certain hazardous substances in electrical and electronic equipmentand that the following standards have been applied:

- EN ISO 12100:2010
- EN 60204-1:2018
- EN IEC 62368-1:2020 + A11:2020,
- EN 55032:2012 + A11:2020,
- EN 55035:2017 + A11:2020,
- EN 61000-3-2:2014 / EN 61000-3-12:2011,
- EN 61000-3-3:2013 / EN 61000-3-11:2000,
- EN IEC 63000:2018.