The Planer

MARIAUD CONSULTING

Our PROGRAM

The Planer

01 Presentation

The planer

The **planer** is a machine generally used after the jointer. Its primary role is to dress the wood pieces, meaning bringing them to the desired thickness while keeping both faces parallel.

Once a face has been made flat and straight on the jointer, the planer takes over to machine the other face parallel to the first. It thus allows for precise adjustment of the wood thickness to obtain a stable piece, ready to be used or processed.

In cooperage, the planer is mainly used for:

- Head pieces,
- And the assembled head.

The objective is manifold:

- Ensure a uniform thickness on all pieces to allow for regular head cutting, guarantee a good seal in the croze, and avoid offsets inside the head.
- Proper alignment of the pieces limits retention zones inside the barrel, which reduces the risk of tartrate formation in the wine.
- Improve the wood finish, with a clean, smooth, aesthetic surface that is easier to store or assemble.

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🧪 What is a retention zone?

A **retention zone** is a **place where liquid (here, wine) can stagnate without circulation**, often due to an **assembly or finishing defect** inside the barrel or the vat.

In the case of **poorly planed heads**, it can be:

- **Offsets between pieces,** creating a hollow.
- **Small steps** or irregularities between the head staves.
- **Roughness** in the wood that retains wine.

These zones promote:

- **Tartrate formation** (crystalline deposit on the walls).
- **Proliferation of micro-organisms** (molds, Brettanomyces...).
- Long-term **alteration of the wine**.

📌Tartrate in casks

Tartrate, in oenology, is a **crystalline deposit** that forms naturally in wine.
It results from the precipitation of compounds such as:

- **potassium bitartrate,**
- **and calcium tartrate.**

These deposits attach to the **bottom and walls** of vinification or aging vessels: stainless steel tanks, barrels, vats....

🫓 Contamination and microbiological risks - The case of Brettanomyces

Even if some **lactic acid bacteria** can, in rare cases, produce stable or barnyard odors, the main culprit for these olfactory defects remains **a yeast of the genus Brettanomyces**.

This yeast:

- Is **resistant to alcohol** and **low pH,**
- Is **often sensitive to SO_2,** but some strains have shown **increased resistance** in recent studies,
- Is **smaller than** Saccharomyces cerevisiae,
- Is classified as **a contamination yeast** in oenology.

📌 According to work led by the **IFV**, the presence of Brettanomyces on grapes or in the vineyard **is not the primary cause** of its presence in wines. Rather, it is the aging **conditions that promote** its development.

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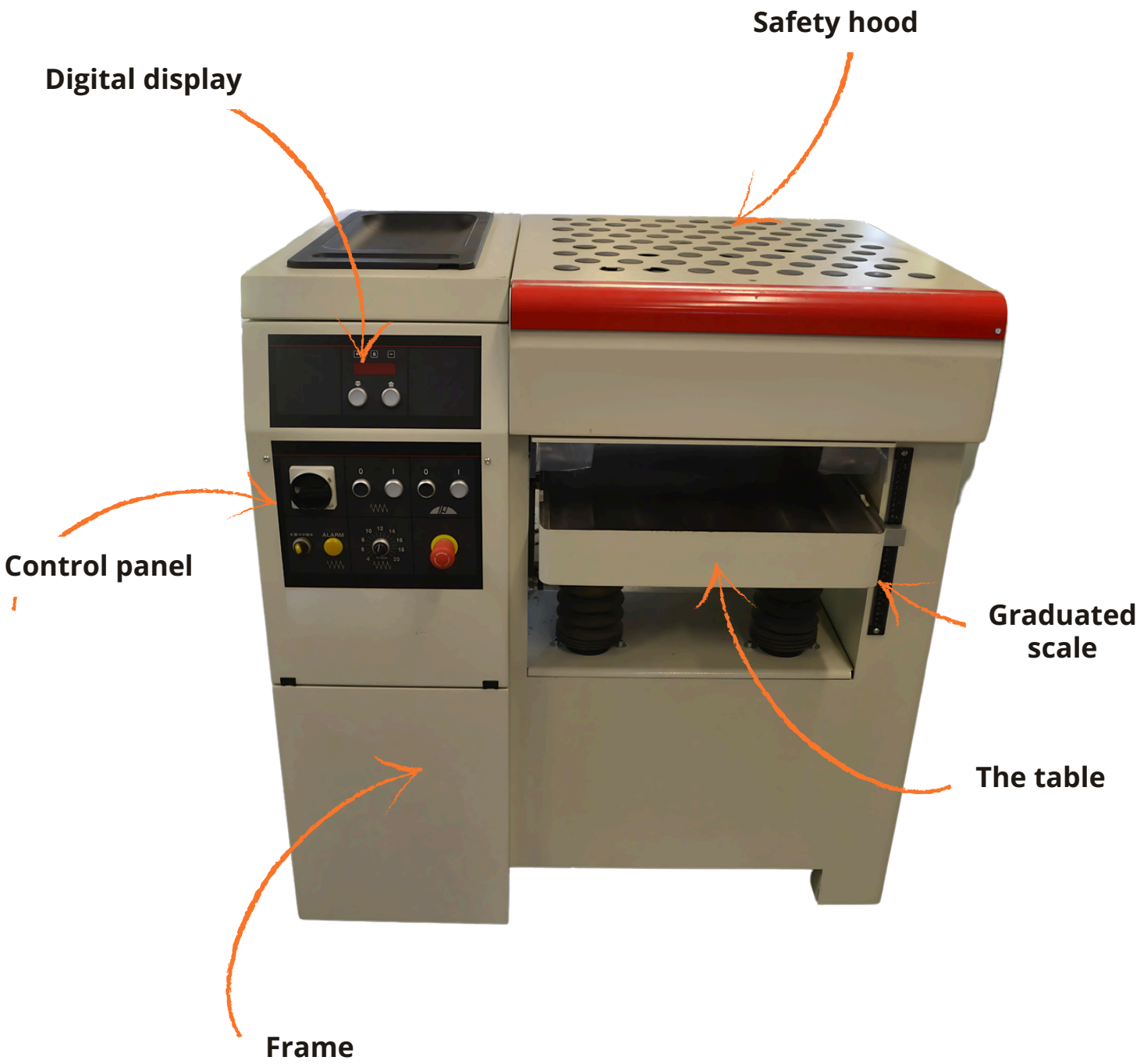
02 Terminology



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As with the jointer, **several planer models exist**. Differences are mainly in **options** and **ease of use.** Here are some examples of variants:

- **Electrically or hydraulically adjustable table**: to gain precision and ease of adjustment.
- **Presence of a digital display**: for precise thickness adjustment to the nearest tenth of a millimeter.
- **Integrated rollers on the table**: to facilitate the passage of long or heavy pieces.

🛠️ **But whatever the machine, the mechanical principle remains the same:**

A piece is driven by rollers under a cutterblock rotating at high speed, which removes material to provide a surface parallel to the reference face.

1. Planer Frame

The frame is the main structure of the planer. It has several essential functions:

- It protects the motors from dust, chips, and projections.
- It contains safety housings, which protect the operator from chains, belts, or other moving mechanical parts.
- The entire machine rests on it: motors, table, cutterblock, drive system....

A solid and well-closed frame means a machine that is:
✅ More **stable**,
✅ More **durable**,
✅ And above all, **safer for the operator.**

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2. The planer table

The **table** is the element on which the wood piece rests during machining.
It is generally made of cast iron or alloy steel to guarantee:

- **Good stability,**
- **Wear resistance,**
- **And constant precision.**

This table is **vertically mobile**: it is adjusted in height to set the final thickness of the piece to be planed.

As on jointers, the table is often engraved with micro-patterns (chevron grooves, cross-hatches...), which has several advantages:

- **Reducing noise** during work**,**
- **Facilitating the evacuation of dust and chips,**
- **Limiting wood adhesion** to the surface for a smoother passage.

🛠️ Proper table maintenance (cleaning + light lubrication) **ensures regular and smooth machining.**

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3. Feed roller (Infeed roller)

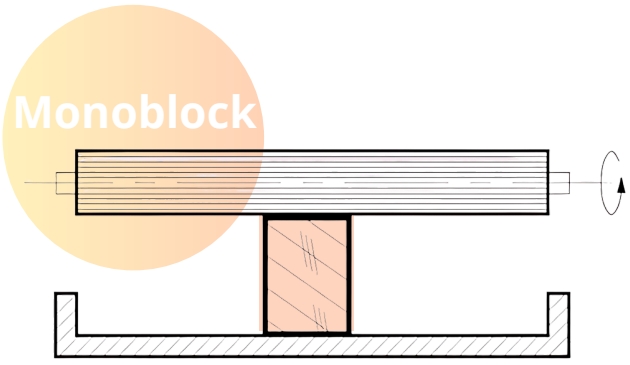
The **feed roller**, or **infeed roller**, is a **ribbed steel cylinder** located upstream of the cutterblock.
Its mission: **to drive the wood piece** at a constant speed through the machine.

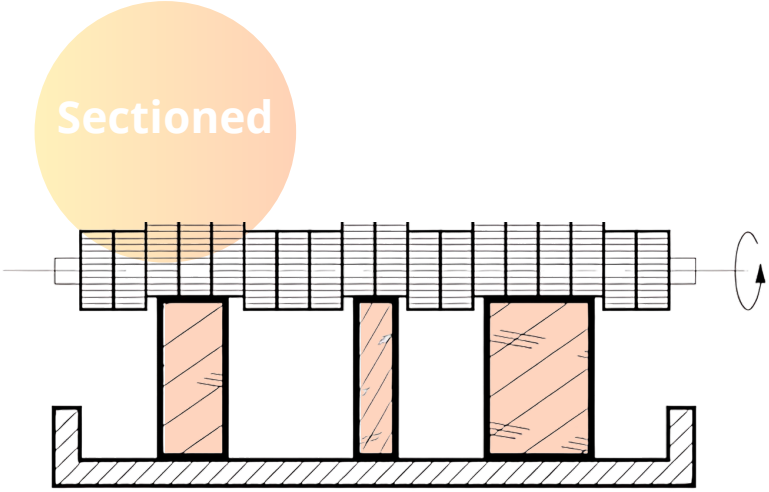
👉 The ribs on the roller improve **grip** on the wood, which:

- Prevents jerks,
- Ensures a regular passage,
- And guarantees a homogeneous finish.

Two types of rollers are found:

- **Monoblock**: a single cylinder. Simpler, but requires pieces to be well-calibrated beforehand.
- **Sectioned**: composed of independent segments. It allows **multiple pieces** to pass side-by-side, even if they do not have **exactly the same height** at the entry. Very practical for **heads being assembled**, or for salvaged staves. Monoblock Sectioned





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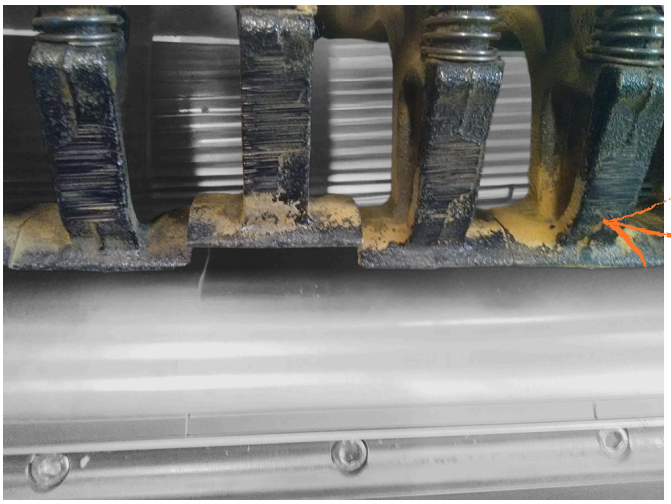
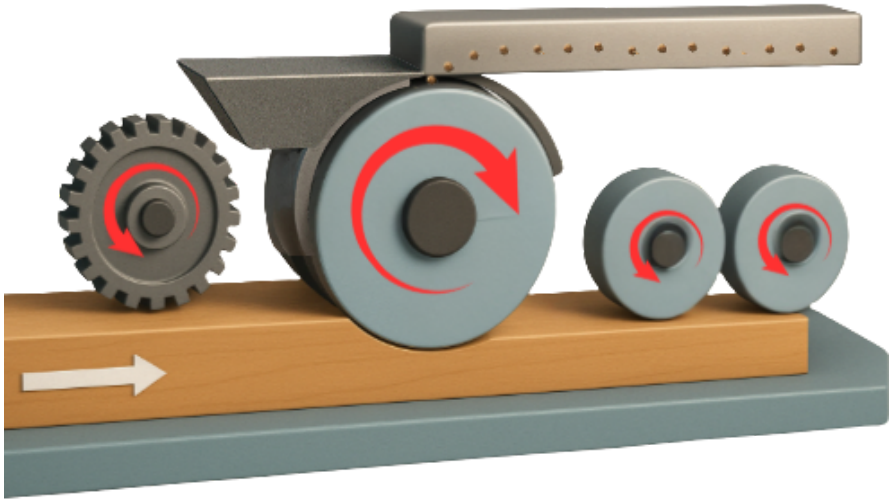
4. The chip breaker

The chip breaker is a spring-mounted part located just above the cutterblock.
It fulfills two essential functions:

- **Guiding chips** toward the suction system to prevent machine clogging and maintain a clean work environment.
- **Acting as a pressure bar by keeping the piece pressed** against the table at the moment of contact with the knives.





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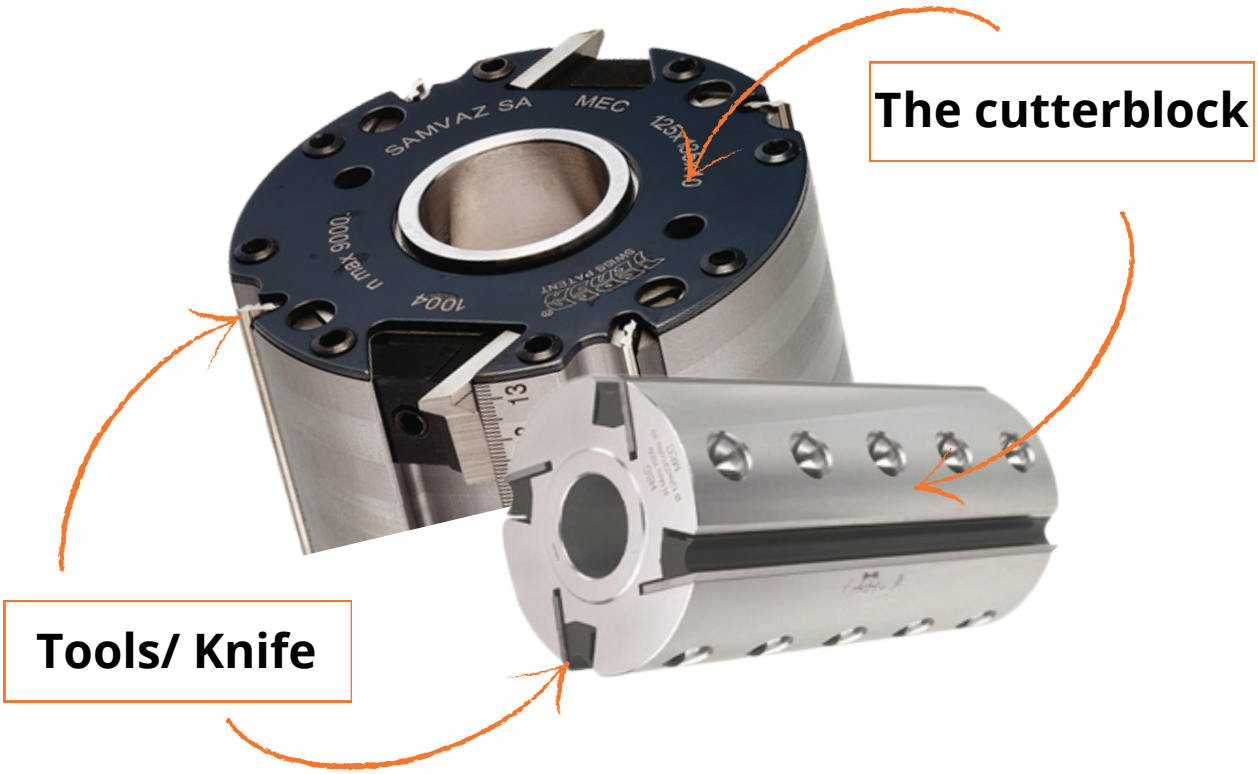
4. The Cutterblock

The cutterblock is the shaft on which the cutting blades are fixed**. Its length corresponds to the table width,** guaranteeing a uniform cut over the entire surface of the piece.

European standards now mandate the exclusive use of **cylindrical cutterblocks,** prohibiting any other shape for safety and stability reasons. These shafts rotate at a speed ranging **between 3,000 and 5,000 revolutions per minute,** depending on the machine model and manufacturer specifications.

The sharpening angle of the tools is generally **between 35° and 40°,** allowing for an effective edge while ensuring good blade longevity.



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4. The outfeed roller

The **outfeed rollers** are located after the **cutterblock**, at the end of the table. Their role is **to push the piece to the machine exit**, while maintaining sufficient pressure to avoid vibrations or parasitic movements.

There can be:

- A **single roller**, or
- **Two rollers**, depending on the model.

These rollers can be:

- **Smooth steel**: durable, precise, but more likely to mark the wood.
- **Vulcanized rubber**: softer, they avoid damaging the wood surface, especially during finishing.

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🧪 Material Zoom - What is vulcanization?

Vulcanization is a chemical process that consists of **improving the mechanical properties of** raw rubber**.**
We are talking here about **natural rubber or synthetic elastomer** (such as butadiene or styrene-butadiene).

🔧**The principle:**

- **A vulcanizing agent** is added **(**the most common is **sulfur),**
- The mixture is then **heated** to a controlled temperature (generally between 140°C and 180°C),
- **Chemical bonds** are created between the molecular chains of the polymer. These are **disulfide bridges** (sulfur-sulfur bonds),
- These bridges transform the raw rubber into **a more stable, resistant, and elastic material.**

✅ **Properties of Vulcanized Rubber:**

- **More elastic,** yet without a "soft" effect.
- **Less sticky.**
- **Increased resistance to wear,** pressure, and deformation.
- **Enhanced resistance to heat, grease, and certain solvents.**
- **Extended service life** in mechanical applications.

🛠️**Application on the Planer:**
Vulcanized rubber rollers are used:

- **At the planer outfeed, to drive the wood without damaging it.**
- **For their ability to absorb shocks and adapt to slight wood irregularities.**
- And for **their longevity,** even in dusty, abrasive, and mechanical environments.

The Planer

03 Adjustments

The motors of a planer

A planer generally operates with **three electric motors**, each having a specific role:

The table lift motor (Up/Down)
→ This is a small motor used **to adjust the table height** according to the desired thickness.
⚠️ It must be precise and well-calibrated, especially if the machine is equipped with a digital display.

The cutterblock motor
→ It drives **the main belt**, which rotates the **cutterblock**.
This is the heart of the machine: it must provide **a stable and sufficient rotation speed** to ensure high-quality planing.

The feed motor
→ It operates **the drive rollers,** which **pull or push the piece through the planer**.
The speed of this motor can sometimes be adjusted depending on the model.

✅ These three motors must be **maintained regularly** (lubrication, belt tension, cleaning) to guarantee **constant performance and optimal longevity** of the machine.

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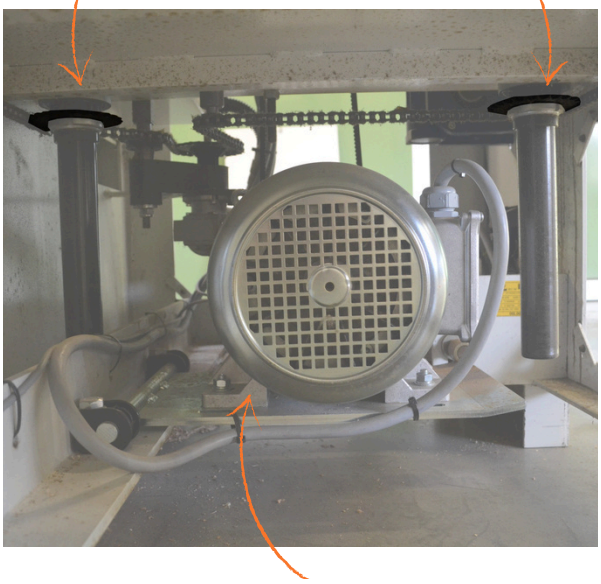
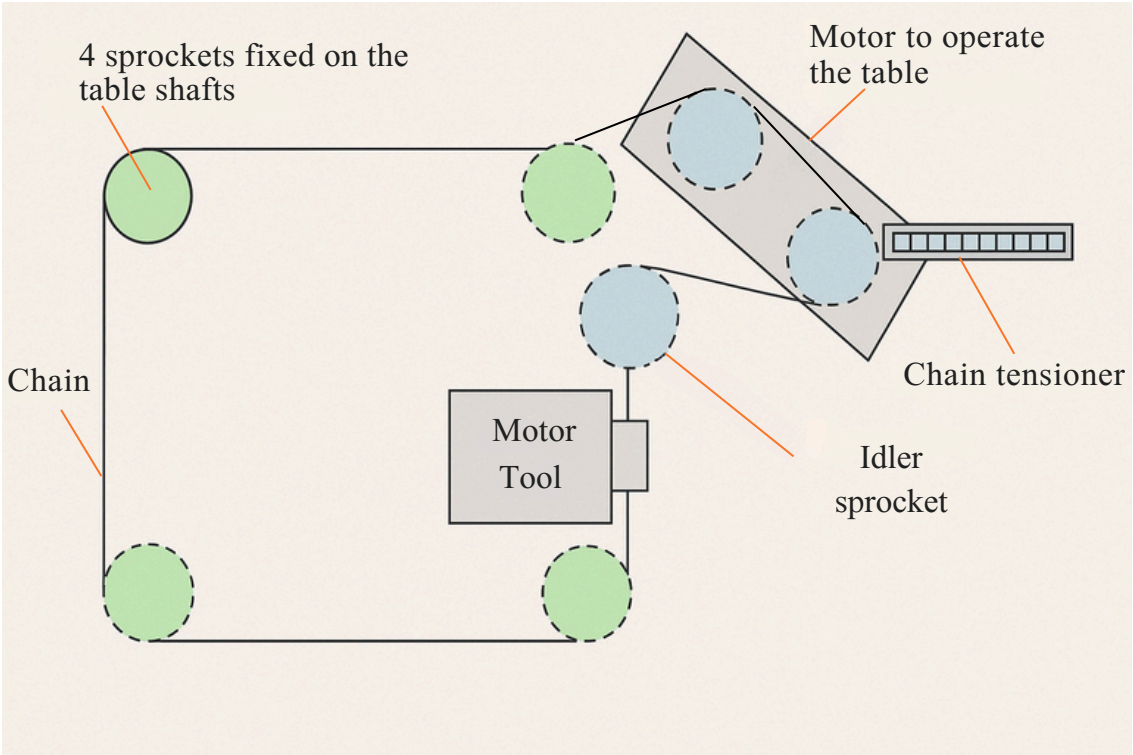
03 Settings





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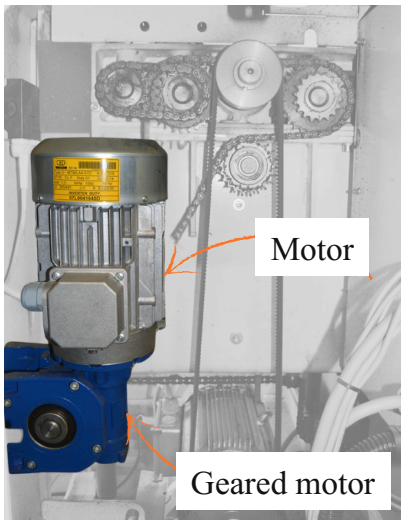

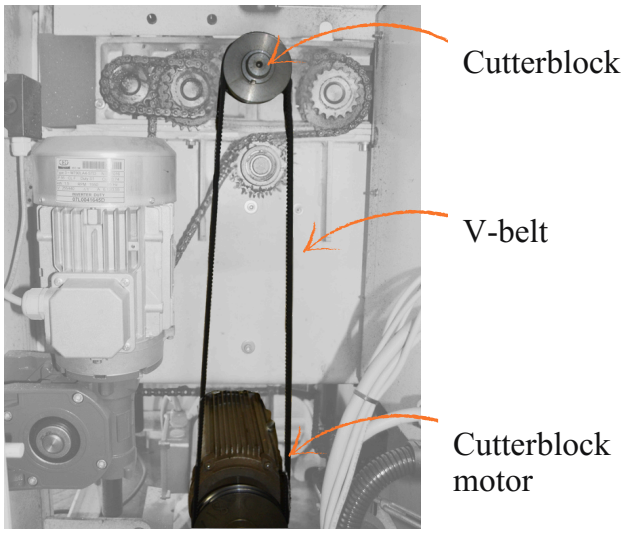

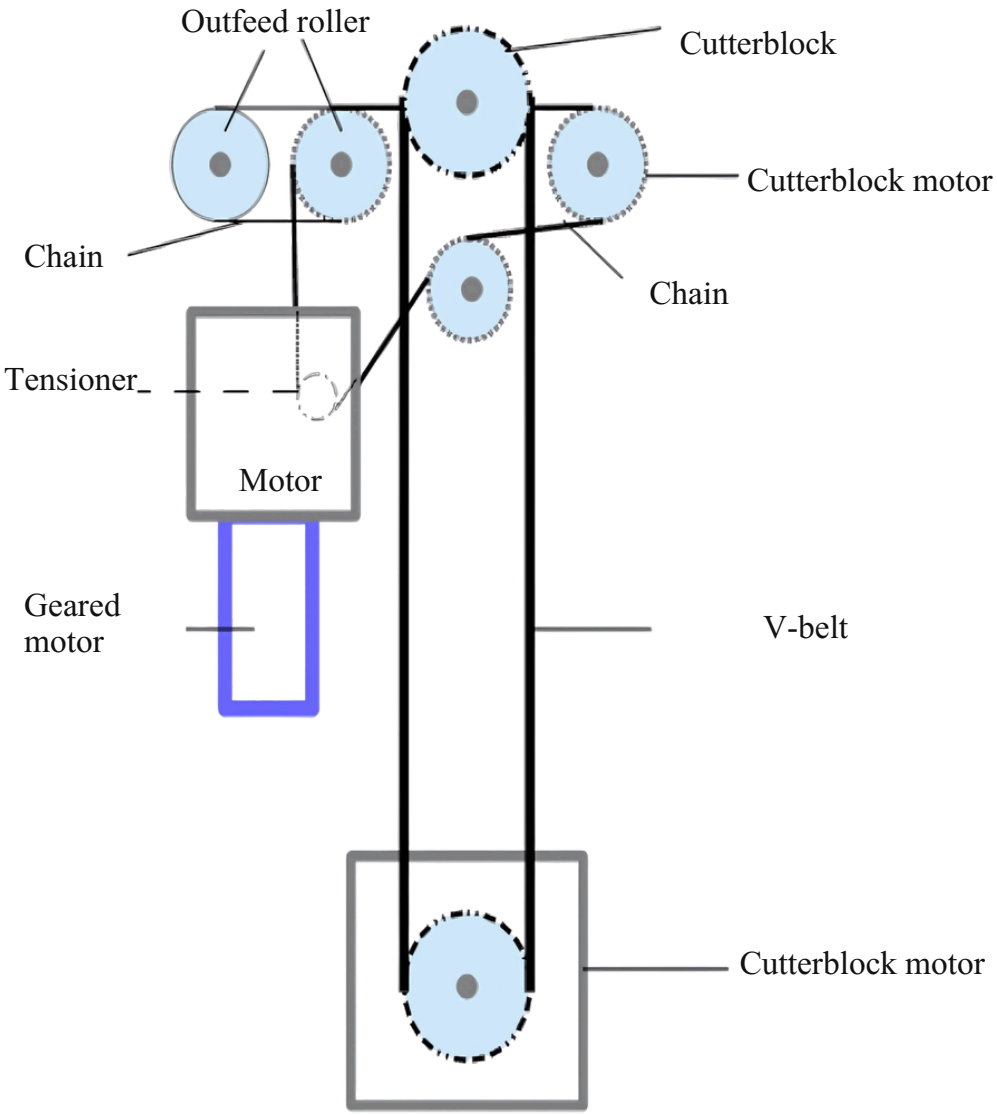

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03 Settings

🔧 The chain tensioner

The chain tensioner is a small mechanical component located behind the motor.

It plays an important role **in the drive transmission:**

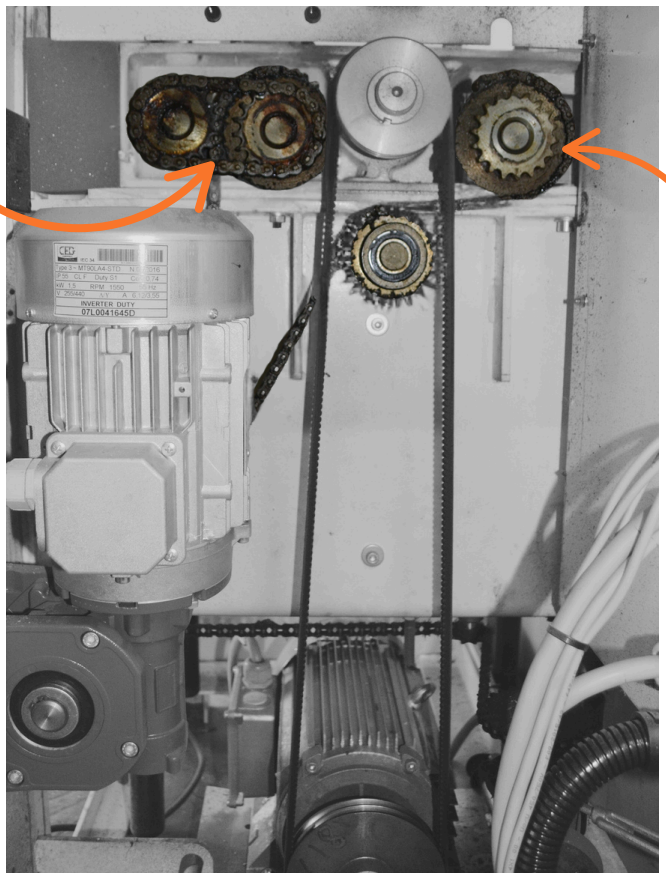
- It ensures **the chain is properly guided,**
- And ensures that it meshes **perfectly with the sprocket.**

🛠️ A poorly adjusted or worn tensioner can lead to:

- Sudden **chain derailment,**
- **Premature wear** of the sprockets**,**
- **Jerking during rotation.**

✅ It is therefore essential **to regularly check its tension, alignment, and the condition of the rollers or guides.**

The two outfeed rollers



Infeed roller

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03 Settings

⚙️ Drive roller spring tensioners

The drive roller spring tensioners allow you **to adjust the pressure exerted by the drive rollers on the wood pieces.**

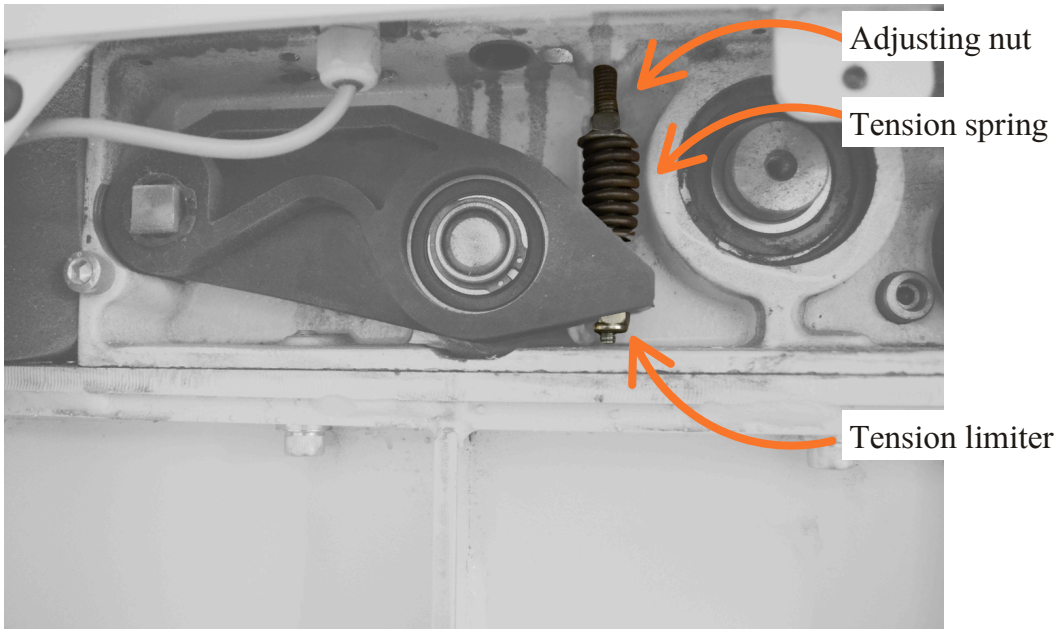
🎯 Their primary function:

- **Adjust the travel** (or displacement) of the rollers so they can adapt to the wood thickness while maintaining constant pressure.
- Prevent thin or irregular pieces **from being poorly driven or marked.**

🔧 In practice:

- **Too little pressure** → risk of the piece slipping or not exiting correctly**.**
- **Too much pressure** → risk of **marking the wood,** premature wear of the rollers, or straining the drive motor.

✅ It is therefore important **to regularly check the spring tension** and adjust the tensioners according to **the wood species and the thickness of the staves or head pieces being worked.**



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03 Settings

📐 Example of Technical Specifications – Industrial Planer

Parameter	Value
Useful machining width	520 mm
Machining table dimensions	530 mm x 900 mm
Min. / max. machining height	3.5 mm / 300 mm
Maximum depth of cut	8 mm
Minimum machining length	220 mm
Minimum machining width	10 mm
Cutterblock rotation speed	4500 rpm
Cutterblock diameter	120 mm
Number of knives	4
Knife dimensions	35 mm x 3 mm x 520 mm
Adjustable feed speed	4 m/min - 20 m/min
Extraction outlet diameter	150 mm

⚠️ Safety – Minimum piece length

👉 **The minimum length** of a piece to be machined (220 mm) is **determined by the distance** between**:**

- **The infeed roller,** and
- **The first outfeed roller.**

If the piece is shorter:

- It risks **being violently rejected** by the rollers,
- Or worse**, being sucked toward the cutterblock,** with a **risk of ejection toward the operator.**

✅ Always **respect the minimum dimensions** and never pass offcuts without a push stick or an appropriate clamping system.

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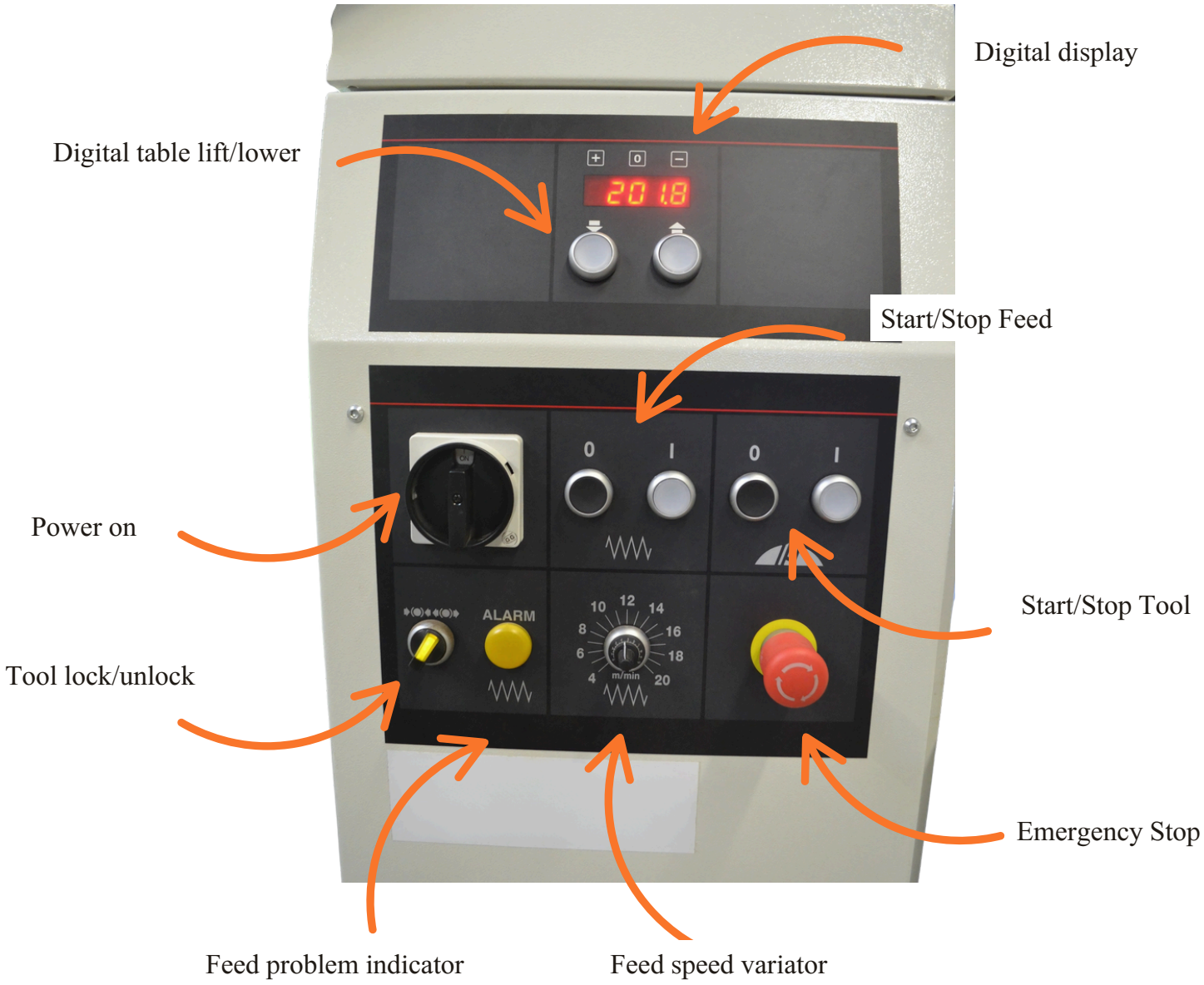
03 Settings

Digital interfaces



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04 Machining advice

❌ Disadvantages of machining against the grain

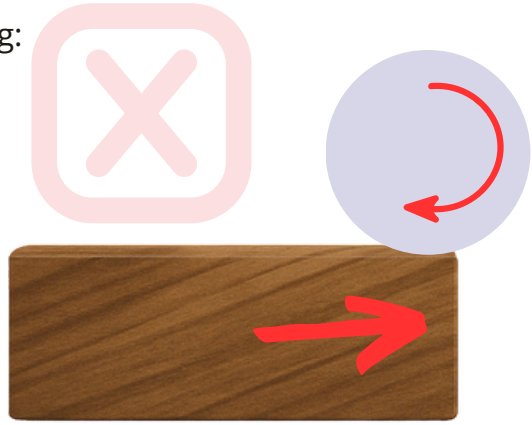
Machining a piece of wood against the grain means attacking the wood in the opposite direction of its fibers' natural orientation.

⚠️ Main disadvantages:

Fiber tearing

→ The knife lifts the fibers instead of cutting them, causing:

- **Visible tears** on the surface,
- **Poor finish** (roughness, splinters).



Degraded visual appearance

→ Even after sanding, the wood may remain:

- **Marked,** with lighter or darker zones,
- **Heterogeneous,** which harms the perceived quality of the product**.**

Premature wear of the knives

→ The tool works harder, so:

- **The knives heat up** and wear out faster,
- This generates **vibrations** and a less clean cut.

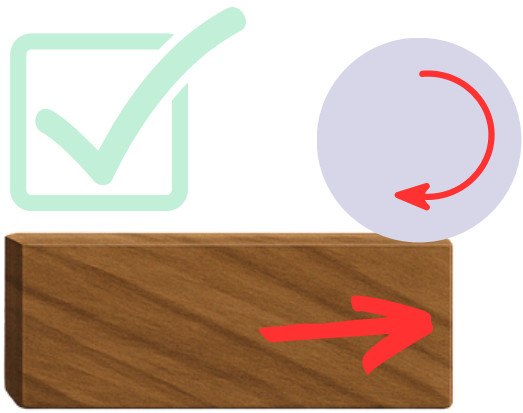
Risk of kickback or snagging

→ The wood can **lift or slip** abruptly,

- Which **increases the risk of accident,**
- and makes the work **less precise**.

🛠️ Tips to avoid machining against the grain:

- Visually identify **the wood grain** (raised fibers, orientation of the veins).
- Turn the piece if possible, or use **lighter passes (thinner cuts).**
- Opt for a higher cutting speed if the direction of the wood cannot be changed.



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04 Machining Advice

📏 Width-setting of wide and thin pieces

When thicknessing **wide and thin wood pieces**, it is recommended to:

✅ **Group several** pieces side-by-side,
✅ And **present the assembly well-centered** on the planer table.
🎯 Why?

- This prevents the pieces from **vibrating, flexing, or shifting.**
- This **distributes the roller pressure** over a larger surface area.
- And allows **for more stable and uniform machining.**

The Planer

05 Maintenance

🪛 Planer Maintenance – What needs to be done

As with the jointer, planer maintenance is **simple but essential.** It guarantees **the longevity of the machine, the quality of the work, and the operator's safety.**

✅ **To be done regularly** (especially after intensive use):

Blow and vacuum
→ Carefully clean the machine:
- The cutterblock,
- The rollers,
- The table slides,
- The motor housings.

This prevents chip buildup, overheating, and interference with adjustments**.**

Grease the grease nipples
→ Apply **two strokes of the grease pump** to the visible grease nipples (axles, slides...).

⚠️ Be careful not to over-apply. Most recent machines are equipped with **sealed bearings,** pre-greased for life at the factory.

🔧 Changing the knives

Replacing the knives is now **quick and accessible,** thanks to:
- **Self-locking systems** (automatic locking screws and wedge bars),
- **Magnetic setting gauges** for disposable knives, which allow each knife to be replaced exactly at the correct height, effortlessly.

⚠️ Always check:
- The condition of the cutting edges,
- The balance of the cutterblock,
- And the proper securing of all parts before restarting.

The Planer

06 Safety

🛑 Safety – Emergency stop buttons

All modern planers are equipped with at least **two emergency stop buttons:**

- **One at the machine infeed**,
- **One at the outfeed.**

🎯 Their role:

- **Immediately stop** all motors (cutterblock, rollers, table).
- **Allow the operator** or a third party to act quickly in the event of an incident (kickback, finger entrapment, malfunction…).
- **Ensure a safe restart** (some machines require a manual reset).

✅ These buttons must be:

- **Visible**,
- **Easily accessible,**
- And **tested regularly** as part of safety routines.

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🧷 Capteur de sécurité à l’ouverture du capot

Modern planers are equipped **with a safety sensor** (or safety switch) that is triggered **when the protective hood is opened.**

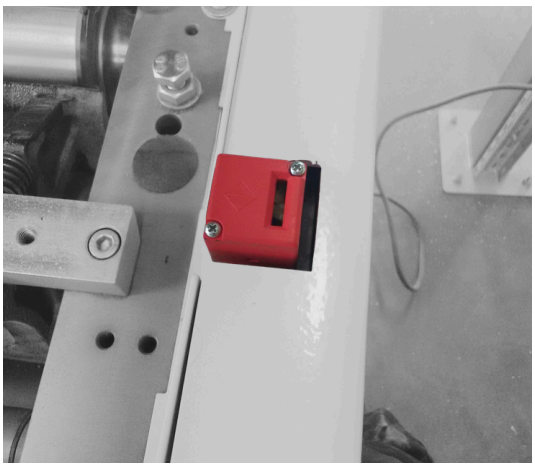
🎯 Function:

- **Automatically cut the power supply to the cutterblock** and moving parts as soon as the hood is lifted.
- **Prevent the machine from restarting** as long as the hood is not closed and locked.

⚠️ This device prevents the operator **from coming into contact with rotating parts**, especially during:

- **Changing the knives,**
- **Internal cleaning,**
- **Or mechanical adjustment**.

✅ It must be **tested regularly** and never bypassed.



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06 Safety

📏 Thickness limiter

A **thickness limiter** (or depth-of-cut limiter) is installed at **the infeed of the planer**. It consists of a **fixed or mobile bar that limits the maximum height** of wood that can enter the machine.

🎯 Function:

- **Prevent depth-of-cut exceeding 5 mm,**
- **Force the operator to perform several progressive** passes if the piece is too thick.

⚠️ If the thickness exceeds this limit, the wood will not enter the machine at the infeed. It cannot be engaged in the planer. This bar ensures a maximum pass of 5 mm.

✅ Advantages:

- **Increased safety** (reduction of violent strain on the cutterblock),
- **Knife preservation** (less impact),
- **Better machining quality** (finer and more uniform work).

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06 Safety

Safety and Personal Protective Equipment (PPE)




- **Safety shoes 👞:** Protect against the risk of crushing and falling heavy objects.
- **Ear defenders or earplugs 🎧:** Essential to reduce exposure to the noise levels generated by the machine.
- **Protective gloves 🧤:** To be used when handling workpieces.
- **Safety glasses 👓:** Protect eyes against flying chips or dust.

Precautions and Appropriate Clothing

- **Use suitable gloves:** Prioritize snug-fitting gloves specific to the tasks performed. Avoid oversized or fabric gloves, which risk being caught in the mechanisms.
- **Tie back long hair:** Prevents any risk of entanglement in moving parts.
- **Avoid loose clothing, rings, and bracelets:** Reduce the risk of snagging on moving parts.

Safety Rules During Operation

- Always **verify that the machine is completely stopped** before any adjustment or intervention.
- Never **place hands in the pressing area** while the machine is running**.**
- Respect **load and pressure instructions to avoid any damage** to the press or ejection of parts.
- Use **integrated safety devices,** such as emergency stop buttons and perimeter guards.

.

Apply these tips right now and take charge of your machine with confidence and mastery!