

Labotom-15

Instruction Manual



Manual No.: 16057025
Revision B

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Original Instructions
For:
Labotom-15 from Serial no. 60520000

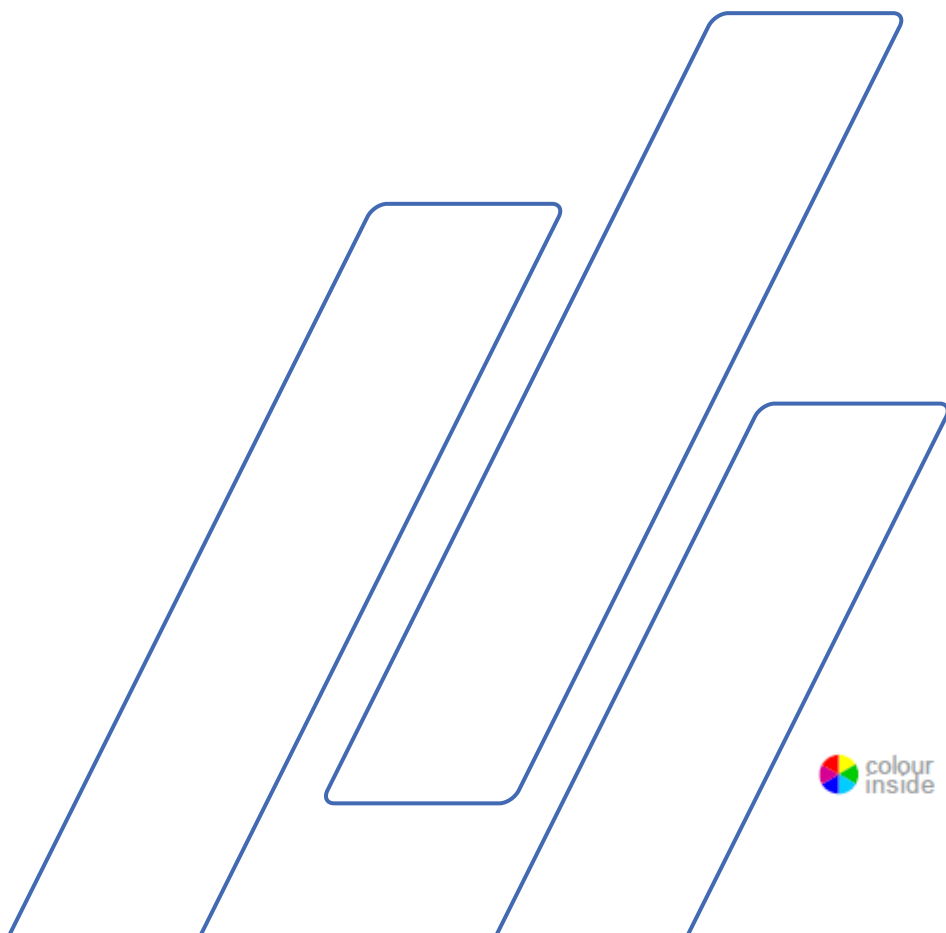


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Intended use

For professional manual wet abrasive cutting of materials for further material inspection and only to be operated by skilled/trained personnel. The machine is intended only to be used with cooling fluids and cut-off wheels developed for this purpose and this type of machine.

Do not use the machine for

Cutting of materials other than solid materials suitable for materialographic studies. In particular, the machine must not be used for cutting any type of explosive and/or flammable material, or materials which are not stable during machining, heating or pressure. The machine may not be used with cutting wheels which are not compatible with the machine requirements (e.g. saw-blade or toothed cutting wheels).

The machine is not recommended for cutting of solid I, H-shaped profiles with outer dimensions of 100 mm and above. Also, it is not intended to cut large hollow profiles, square or circular, extending outer dimensions of 150 mm.

The machine is for use in a professional working environment (e.g. a materialography laboratory).

Model:

Labotom-15

**NOTE:**

READ the instruction manual carefully before use.
Keep a copy of the manual in an easy-to-access place for future reference.

Always state *Serial No* and *Voltage/frequency* if you have technical questions or when ordering spare parts. You will find the *Serial No.* and *Voltage* on the type plate of the machine itself. We may also need the *Date* and *Article No* of the manual. This information is found on the front cover.

The following restrictions should be observed, as violation of the restrictions may cause cancellation of Struers legal obligations:
Instruction Manuals: Struers Instruction Manual may only be used in connection with Struers equipment covered by the Instruction Manual.

Struers assumes no responsibility for errors in the manual text/illustrations. The information in this manual is subject to changes without notice. The manual may mention accessories or parts not included in the present version of the equipment.

Original instructions. The contents of this manual are the property of Struers. Reproduction of any part of this manual without the written permission of Struers is not allowed.

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Labotom-15 Safety Precaution Sheet

Read carefully before use

1. Ignoring this information and mishandling of the equipment can lead to severe bodily injuries and material damage.
2. The machine must be installed in compliance with local safety regulations.
3. The machine must be placed on a safe and stable support table.
4. When lifting the machine using a forklift, lift from front or rear - never lift the machine from the side.
5. When lifting the machine using lifting straps, ensure that the straps are crossed and do not press on the sides of the machine.
6. The operator(s) must read the Safety and User's Guide sections of this manual and the relevant sections of the manuals for any connected equipment and accessories.
The operator(s) must read the Instructions for Use and, where applicable, Safety Data Sheets for the applied consumables.
7. Use only intact cut-off wheels. The cut-off wheels must be approved for min. 2,210 RPM or 50 m/s.
8. The machine is not for use with saw-blade type cut-off wheels.
9. Do not use the machine for cutting materials that are flammable or unstable during the cutting process (e.g. combustible or explosive materials).
Do not use the machine for cutting materials that are not suitable for materialographic cutting.
10. Observe the current safety regulations for handling, mixing, filling, emptying and disposal of the additive for cooling fluid. Avoid skin contact with the additive for cooling fluid.
11. The workpiece must be securely fixed in a clamping device. Large or sharp workpieces must be handled in a safe way.
12. Use of working gloves is recommended as workpieces may be both very hot and produce sharp edges. Wearing of gloves is also recommended when flushing and cleaning the machine.
13. Use of safety shoes is recommended when handling large or heavy workpieces.
14. Use of safety goggles is recommended when using the flushing gun. Only use the flushing gun for cleaning *inside* the cutting chamber.
15. Take care not to activate the flushing function accidentally.
16. Protruding workpieces should be shielded or marked.

- 17.** The cutting handle should be lowered slowly and carefully, to avoid breaking the cut-off wheel.
- 18.** Struers recommends the use of an exhaust system as the materials to be cut may emit harmful gasses or dust.
- 19.** The machine emits only moderate noise. However, the cutting process itself may emit noise, depending on the nature of the workpiece.
Use hearing protection if exposure to noise exceeds levels set by local regulations.
- 20.** The machine must be disconnected from the mains prior to any service.
Wait 5 minutes until residual potential is discharged.
- 21.** In case of fire, alert bystanders, the fire brigade and cut power.
Use a powder fire extinguisher. Do not use water.

The equipment should only be used for its intended use and as detailed in the Instruction Manual.

The equipment is designed for use with consumables supplied by Struers. If subjected to misuse, improper installation, alteration, neglect, accident or improper repair, Struers will accept no responsibility for damage(s) to the user or the equipment.

Dismantling of any part of the equipment, during service or repair, should always be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).

Icons and typography

Stuers uses the below icons and typographical conventions. A list of the Safety Messages used in this manual can be found in the chapter on Cautionary Statements in the Reference Guide section of the Instruction Manual.

Always consult the Instruction Manual for information on the potential hazards marked by the icons fixed to the machine.

Icons and Safety Messages



ELECTRICAL HAZARD

indicates an electrical hazard which, if not avoided, will result in death or serious injury.



DANGER

indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



WARNING

indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



CAUTION

indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



CRUSHING HAZARD

indicates a crushing hazard which, if not avoided, could result in minor, moderate or serious injury.



EMERGENCY STOP

General Messages

**NOTE:**

indicates a risk of damage to property, or the need to proceed with special care.

**HINT:**

indicates additional information and tips.

Colour Inside Logo



The 'colour inside' logo on the cover page of this Instruction Manual indicates that it contains colours which are considered to be useful for the correct understanding of its contents.

Users should therefore print this document using a colour printer.

Typographic conventions

Bold type	indicates button labels or menu options in software programs
<i>Italic type</i>	indicates product names, items in software programs or figure titles
<u>Blue text</u>	indicates a link to another section or webpage
■ Bullets	indicates a necessary work step

User's Guide

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1. Getting Started

Device Description

Labotom-15 is a manual cut-off machine. The machine is designed for wet abrasive cutting and it offers safe cutting of all stable, non-explosive metals. For the machine to function, it must run with a cooling and/or recirculation unit.

The cutting process starts by securing the workpiece to the cutting table with suitable clamping tools. The operator selects consumables (e.g. cut-off wheel).

To start cutting, the protective cover must be closed for the machine to work. It locks when the operator starts to cut, and it remains locked for the duration of the cutting. The operator manually controls the cutting with the cutting handle. When the cut-off wheel stops, the lock releases and the workpiece and the specimen can be removed.

In case of a power loss during a cutting process, use the special key to open the power-to-open safety guard. If released, the category C emergency stop cuts the power to the motor that runs the cut-off wheel. The protective cover can be opened once the cut-off wheel comes to a standstill.

The machine may be connected to an external exhaust system to remove fumes from the cutting process.

Checking the Contents of the Crate

In the packing crate you should find the following parts:

- 1 Labotom-15
- 1 Spanner 30 mm, for changing the cut-off wheel
- 2 Spring Washers for mounting cut-off wheel (spare parts)
- 1 Triangle key (for unlocking of the safety lock when not connected to main power)
- 1 Pipe for the exhaust, 50 mm dia.
- 1 Drain pipe 75 mm dia.
- 1 Outlet hose, 75 mm dia., 2 m
- 2 Worm hose clamps
- 1 Elbow pipe 75 mm dia.
- 1 Set of Instruction Manuals

Unpacking Labotom-15

- Remove the two transport brackets that secure Labotom-15 to its transport pallet – use a torque bit T30 key to remove the eight coach bolts.

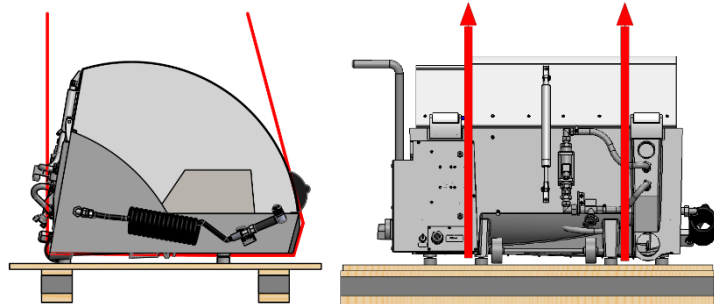


HINT:

Store the packing crate, foam packaging and fittings for use whenever Labotom is transported/re-located. Failure to use the original packaging and fittings could cause severe damage to the machine and will void the warranty.

Lifting Labotom-15

- Lift Labotom with a crane by placing straps¹ underneath the base of the machine, on the left side and on the right side.



Lifting points. Place straps on the inside of the rubber feet.



CAUTION

The machine is heavy. Always use crane and straps.

- Place the two lifting straps under Labotom-15.
 - Position the back strap on the inner side of the feet.
 - Position the front strap on the outer side of the feet.
- Check that the straps are parallel to each other and position the lifting bar so that the two straps are kept apart below the lifting point.

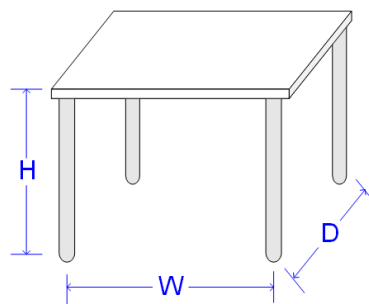
¹ Crane and straps must be approved of at least twice the weight of the load.

Placing Labotom-15

- Install the machine close to the power supply and the exhaust system and the cooling system.
 - Make sure there is enough room behind the machine for the inlet and outlet hoses and for the cover to be opened fully.
- Install the machine in a room with sufficient light (at least 300 lux) of good quality and without glare.
- Place the machine on a rigid, stable workbench (optionally, buy a Struers table unit).
Labotom-15 has two wheels at the rear to easily adjust the position of the machine.
- Check that the machine is level and that all four rubber feet rest on the workbench.

Recommended workbench dimensions

To facilitate easy access for servicing, allow sufficient space around the machine.

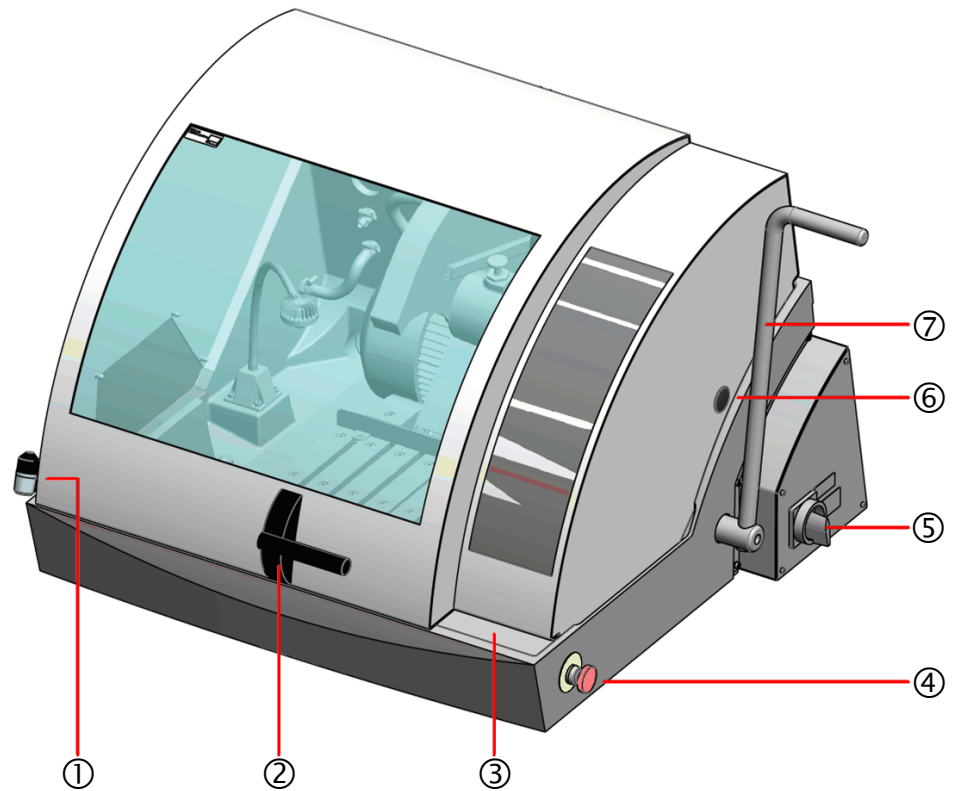


Height (H): Local preference
Width (W): 92cm/ 36.2"
Depth (D): 90 cm / 35.4"

Recommended workbench dimensions. Height of table (X) follows local preferences.

**Getting Acquainted with
Labotom-15**
Front

Take a moment to familiarise yourself with the location and names of the Labotom-15 components.



- | | |
|----------------------------|---------------------------------------|
| ① Flushing gun | ⑤ Main power switch |
| ② Lifting handle for cover | ⑥ Access hole for safety lock release |
| ③ Controls | ⑦ Cutting handle |
| ④ Emergency stop | |



NOTE:

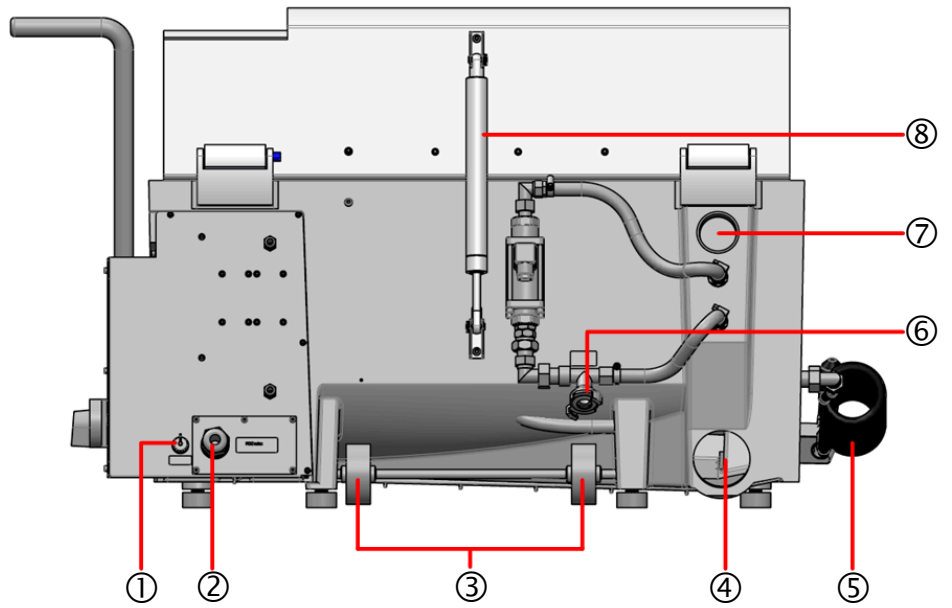
The cover on Labotom-15 can only be opened when the machine is connected to a power supply and the main power switch is on.



Turn key carefully.

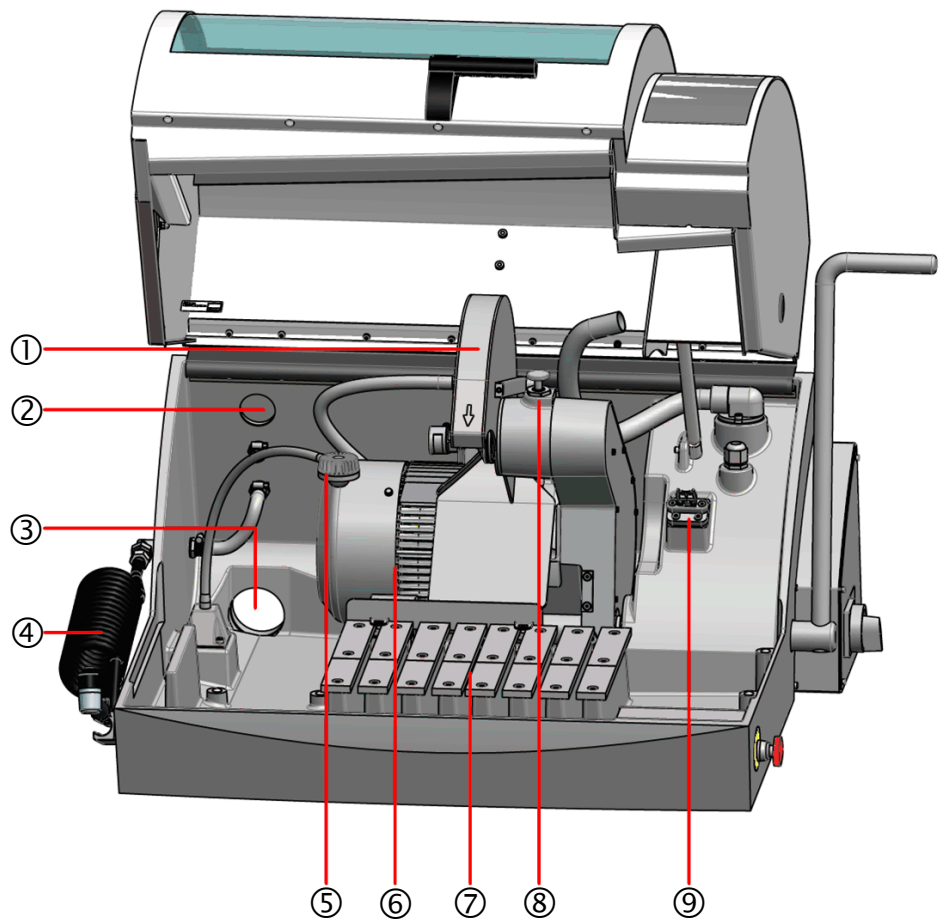
- To open the cover when the power is not connected, lift the front of the Labotom-15 and carefully move it forwards to access the safety lock release. Release the safety lock using the triangle key.
- Remember to re-activate the safety lock release before operating Labotom-15.

Rear view



- | | |
|---------------------------------|--|
| ① Cooling unit connection | ⑥ Water inlet |
| ② Power supply cable connection | ⑦ Connection for external fume extraction system |
| ③ Wheels | ⑧ Damper |
| ④ Drain | |
| ⑤ Flushing gun | |

Inside the Cutting Chamber



- | | |
|--|------------------------|
| ① Cut-off wheel guard | ⑥ Motor - cutting unit |
| ② Connection for external fume extraction system | ⑦ Cutting table |
| ③ Drain | ⑧ Spindle lock |
| ④ Flushing gun | ⑨ Safety lock |
| ⑤ Lamp | |



MAIN SWITCH

The main switch is located on the right-hand side of Labotom-15.

- Turn clockwise to switch on the power.



EMERGENCY STOP

- Push the red button to Activate.
- Turn the red button clockwise to Release.



NOTE:

Do not use the Emergency stop for operational stop of the machine during normal operation.
BEFORE releasing (disengaging) the Emergency stop, investigate the reason for activating the Emergency stop and take any necessary corrective action.

Supplying Power



ELECTRICAL HAZARD

The machine must be earthed (grounded).
Switch the power off when installing electrical equipment.
Check that the mains voltage corresponds to the voltage stated on the type plate on the side of the machine.
Incorrect voltage may result in damage to the electrical circuit.

- Open the electric connection box and connect a 4-lead or 5-lead cable in the following way:

PE:	earth
N:	neutral (not used)
L1:	phase
L2:	phase
L3:	phase

EU cable		UL cable	
L1	Brown	L1	Black
L2	Black	L2	Red
L3	Black or grey	L3	Orange/ turquoise
Earth	Yellow/ green	Earth	Green (or Yellow/ green)
Neutral	Blue (Not used)	Neutral	White (Not used)

- Mount an approved plug on the cable or hard-wire into the mains according to electrical specifications of your unit and local regulations:



HINT:

For more details, please refer to the [Technical Details](#) section in the *Reference Guide* segment of the *Instruction manual*.

Direction of the Cut-off Wheel

Check that the cut-off wheel rotates in the direction indicated by the arrow on the guard for the cut-off wheel. If the direction of rotation is incorrect, switch two of the phases.

Connecting a Recirculation Cooling Unit

To ensure optimal cooling and lubricating, Labotom-15 must be fitted with a Struers Cooling Unit. Cooling System 4 is the Cooli configuration designed for use with Labotom-15.

**NOTE:**

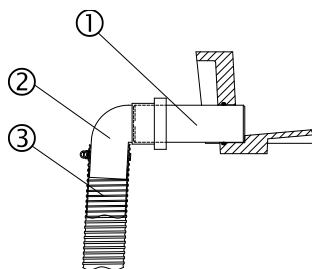
Before connecting the cooling unit to the Labotom, follow the instructions in the Struers Cooling Unit Instruction Manual to prepare it for use.

**NOTE:**

The cooling fluid supply must have a head pressure in the range 1 – 5 bar (14.5 – 73 psi).

**ELECTRICAL HAZARD**

The machine must be earthed (grounded).
Switch the power off when installing electrical equipment.
Check that the mains voltage corresponds to the voltage stated on the type plate on the side of the machine.
Incorrect voltage may result in damage to the electrical circuit.



To connect the Labotom-15 to a recirculation cooling unit:

- Plug the Cooli control unit's communication cable into the Labotom control socket.
- Connect the Cooling fluid water inlet hose to the pump on the recirculation unit using the quick coupling.
- Connect the other end of the hose to the quick coupling of the Labotom water inlet.

Insert the drain pipe ① in the water outlet on the back of Labotom-15 and mount the 90° elbow pipe ②. Lubricate the sealing ring with grease or soap to facilitate insertion. (Alternatively, switch around so the elbow pipe is mounted in the machine and the drain pipe afterwards).

- Strip the steel spring from approx. 3 cm of the outlet hose and cut it away. Bend the cut end towards the centre of the hose. Mount the outlet hose ③ onto the pipe and clamp the stripped section using a hose clamp.
- Check that the outlet hose slopes downwards when connected.
- Insert the open end of the hose into the mounting hole in the bracket on top of the Cooli filter unit. If necessary, adjust the length of the hose.
- Connect the cooling unit to the mains power supply.

**NOTE:**

Galvanic corrosion may occur, when sectioning Copper on a regular basis.
Use Struers additive for cooling fluid, Corrozip-Cu.

Connection to an External Exhaust System

Struers recommends the use of an exhaust system as workpieces may emit harmful or unpleasant gases when cut. The unit is prepared for connection to an exhaust system via a hole at the rear of the cabinet.

- Remove the red plug from the exhaust hole.
- Insert the 50 mm / 2" dia. pipe in the hole for exhaust.



NOTE:

Check that the end of the pipe is level with the wall of the Labotom-15 and does not "stick out" into the cutting chamber.

- Mount an exhaust hose from your local exhaust system onto the pipe and clamp using a hose clamp.

Mounting / Dismounting a Cut-off Wheel

- Push the cutting handle backwards until the tilting cutting unit is in back position.
- Press the pin for the spindle lock on the right-hand side of the cut-off wheel guard, turning the cut-off wheel until the spindle lock clicks.
- Remove the nut with the spanner.
- Remove the spring washer, flange and cut-off wheel (if one is already mounted).
- Mount a new cut-off wheel, the flange, spring washer and nut.
- Tighten the nut securely with the spanner and release the spindle lock.



NOTE:

Use the Struers Selection Guide for Cut-off Wheels in the [Consumables Catalogue](#) on Struers.com.

Conventional cut-off wheels like Al_2O_3/SiC should be placed between two cardboard discs, to protect the cut-off wheel and flanges.

For maximum precision with diamond or CBN cut-off wheels, do not use cardboard discs.



HINT:

The spindle on Labotom-15 is left-hand threaded.

Clamping Devices

There are several types of clamping tools available as accessories (please refer to the [Labotom-15 brochure](#) for details of the range available).

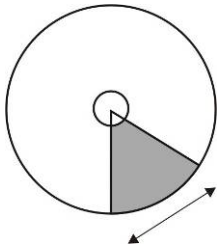
Clamping devices are ordered separately.



NOTE:

When fitting clamping tools, always ensure that they cannot come into contact with the cut-off wheel. Failure to do so may result in the clamping tools being damaged.

Positioning Clamping Devices



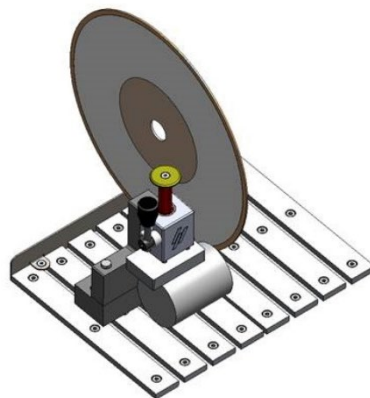
Always position clamping devices **parallel** to the cutting table (a ruler can be used to check that the clamping device is not at an angle to the cutting table).

For optimal cutting, position the workpiece **in the middle or slightly to the front of the cutting table**; a line on the table indicates the correct position to centre the workpiece.

The best cutting results are obtained when the lower quadrant of the cut-off wheel enters the workpiece (shaded area in drawing).

Vertical Quick Clamping Device

- Mount the Vertical Quick Clamping Device on the left-hand side of the cutting table.
- Place the workpiece on the cutting table.
- Turn the handle on the Vertical Quick Clamping Device to vertical position.
- Push the clamping device downwards the workpiece and lock in place by pulling the locking handle forward.



Example of a cylindrical workpiece secured using a Vertical Quick Clamping Device

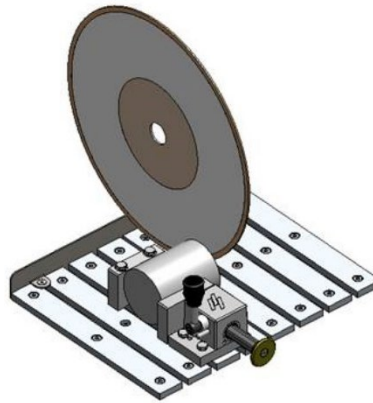


NOTE:

Make sure that the nut on the cutting unit cannot come into contact with the clamping plate.

Mounting a Quick Clamping Device and Spring Clamp

- Mount the back stop for the Quick Clamping Device on the left-hand side of the cutting table. The cut-out corner should be on the right. *Do not tighten the screws.*
- Mount the back stop for the Spring Clamp on the right-hand side of the cutting table. *Do not tighten the screws.*
- Place the workpiece on the cutting table (if possible in the middle or slightly to the front).
- Push the back stops against the workpiece and tighten the screws using the spanner.
- Mount the Quick Clamping Device on the left-hand side of the cutting table and the spring clamp on the right. Adjust their positions to fit the dimensions of the workpiece.
- Tighten the screws using the spanner.



Example of a cylindrical workpiece secured using a Quick Clamping Device

Noise

See [Technical Data](#) in the rear of the Instruction Manual for the sound pressure level value².

Handling noise (during operation)

Different materials have different noise characteristics.

Decreasing the rotational speed and/or the force with which the cut-off wheel is pressed against the workpiece, will lower the noise.

Processing time may increase.



CAUTION

Prolonged exposure to loud noises may cause permanent damage to the hearing,
Use hearing protection if exposure to noise exceeds levels set by local regulations.

Vibration

See [Technical Data](#) in the rear of the Instruction Manual for information on total vibration exposure to upper parts of the body.

Handling vibration (during operation)

Manual cutting of workpieces causes the cutting handle to vibrate. Take action to lower the vibration where possible; decrease the pressure or use a vibration-reducing glove.

It is always recommended to clamp with recommended Struers clamping solutions to reduce the source of vibration.



CAUTION

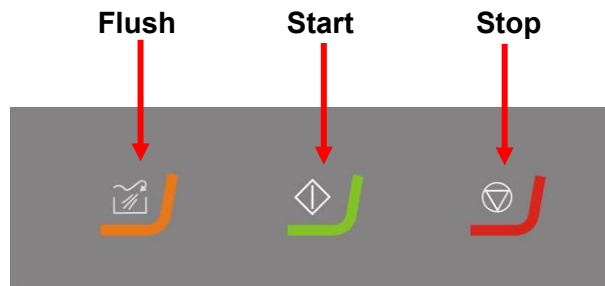
Risk of hand to arm vibration during manual cutting.
Prolonged exposure to vibration may cause discomfort, joint damage or even neurological damage.


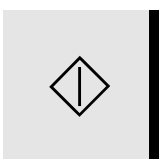
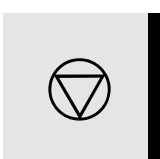
² See chapter Legal and Regulatory (EN ISO 16089:2015).

2. Basic Operations

This chapter describes the basic operation of Labotom. Information on the advanced functions can be found in the Advanced Operation section of the Instruction Manual.

Using the Controls



	Key	Function
FLUSH		Starts the water pump. Press rear of flushing gun to start and regulate flushing.
START		Starts the machine. The cut-off wheel starts rotating and the water pump is turned on. Cannot be activated with the cover open or overload of the cutting motor.
STOP		Stops the machine. The cut-off wheel stops rotating. The water pump is turned off.

Location of the Main Switch

Please see drawing in [Getting Acquainted with Labotom-15](#).


Flushing Gun

Labotom-15 comes complete with a flushing system. This enables the cutting chamber to be rinsed clean of any debris discarded during the cutting process.

Flushing is operated through the Control Panel buttons.



CAUTION

- Avoid skin contact with the additive for cooling fluid.
- **Do not** press FLUSH  until the flushing gun points into the cutting chamber.





Open the valve.



Start the pump.
1=Start, 2=Stop



Press to flush.

- Remove the flushing gun from the holder.
- Point the flushing gun into the cutting chamber.
- Open the valve on the flushing gun.
- Press FLUSH  to start the water pump.
- Press the rear of the nozzle and clean the cutting chamber.
- Press STOP  to stop flushing.
- Close the valve.
- Place the flushing gun back in the holder.
- Leave the cover open to let the cutting chamber dry completely, and to avoid possible corrosion from condensation.



NOTE:

Remember to place the flushing gun back in its holder when you have finished flushing the cutting chamber.

NOTE:

Do not clean the cover directly with the flushing gun as this may result in dripping water when the cover is open.

Clamping the Workpiece

Using the Struers Vertical Quick Clamping Device (available as an Accessory).

- Clean the cutting table with the flushing gun.
- Place the workpiece under the clamp of the Vertical Quick Clamping Device (on the left-hand side of the cutting table).
- Adjust the position of the device, so that the workpiece is positioned in the middle of the cutting table. Use the socket spanner.
- Lower the cut-off wheel to check the position.
- Turn the handle on the Vertical Quick Clamping Device to vertical position. Push the clamping device downwards on the workpiece and lock in place by pulling the locking handle forward.




NOTE:

It is very important that the workpiece is firmly and securely fixed in the Quick Clamping Device. Otherwise, the workpiece may loosen and cause the cut-off wheel to break and/or unintended deformations to the workpiece and accessories.

For best positioning of the clamping device please see the section on [Clamping Devices](#) on page 21.


Starting/Stopping the Cutting Process

- Switch on the main power.
- Close the cover.
- Press the START  button to start the machine. The cut-off wheel starts rotating and the cooling water starts to flow.
- Carefully, move the cut-off wheel towards the workpiece by pulling the cutting handle until it is in contact with the workpiece.
- Let the cut-off wheel make a small notch into the workpiece. Then increase the force and continue cutting. Adapt the speed at which the cut-off wheel is fed through the workpiece to suit the material and the wheel.



NOTE:

Large and/ or very hard workpieces may require operator strength to cut through.

- When the cut-off wheel has almost cut through the workpiece, reduce the cutting force.
- When the workpiece is cut through, return the cutting handle to its back position.
- Press the STOP  button to stop the cut-off wheel and cooling water.
- Wait until the safety lock is released before opening the cover (there is a 4 second delay from pressing STOP).



NOTE:

The cover on Labotom-15 is equipped with a safety lock. The cutting motor will not start with the cover open.

NOTE:

Leave the cover open when the machine is not used to let the cutting chamber dry completely to avoid possible corrosion from condensation

3. Maintenance

General Cleaning

To ensure a longer lifetime for your Labotom-15 Struers strongly recommends daily cleaning of the cutting chamber. Clean the cutting chamber thoroughly if the Labotom-15 is not to be used for a longer period of time.

Recirculation Cooling Unit

Please refer to the Instruction Manual for the Recirculation Cooling Unit.

Daily Inspection

Labotom-15 must be checked before use. If there are signs of damage, do not use the machine until any damage is repaired.

Checking the Protective Cover



CAUTION

Risk of injury

The protective cover will minimize the risk of ejection but will not eliminate them completely.

Defective dampening springs may result in failure of the cover staying up in the open position.

- Check that the cover stays up, in the open position. If the cover does not stay up, this may indicate that the dampening springs need to be replaced. Contact Struers Service.
- Visually inspect the cover and the screen for signs of wear or damage (e.g. dents, cracks, damage to edge sealing).

Please refer to the section on [Replacing the Screen in the Cover](#) if the cover is damaged.

The cover screen should be **replaced immediately** if it has been weakened by collision with projectile objects or if there are visible signs of deterioration or damage.

Checking the Wheel Guard

- Visually inspect that the cut-off wheel guard is intact.

Checking the Safety Lock

It is very important that the interlock tongue is checked regularly for damage and perfect fitting.

- Check the interlock tongue for correct function. It must slide unobstructed into the locking mechanism.

Daily Maintenance Machine

- Clean all accessible surfaces with a soft, damp cloth.



NOTE:

Do not use a dry cloth as the surfaces are not scratch resistant. Grease and oil can be removed with ethanol or isopropanol.

NOTE:

Never use acetone, benzol or similar solvents to clean the PETG screen.

NOTE:

Do not clean the lamp glass with alcohol. Use a damp cloth only.

Cleaning the Cutting Chamber


- Clean the cutting chamber.
 - Pay attention to cleaning the T-slot cutting table (a [T-slot cleaner](#) is available as an accessory).
 - Remove cutting debris and swarf from the cutting chamber.

See: [Flushing Gun](#).



CAUTION

Avoid skin contact with the **additive** for cooling fluid.

Do not press FLUSH  until the flushing gun points into the cutting chamber.



NOTE:

Leave the cover open when the machine is not in use to let the cutting chamber dry completely to avoid possible corrosion from condensation

Weekly Maintenance

The machine should be cleaned regularly to avoid damaging effects to the machine and the specimens from abrasive grains or metal particles.

- Clean painted surfaces, and the control panel with a soft, damp cloth and common household detergents.
For heavy duty cleaning, use [Struers Cleaner](#).
- Clean the cover with a soft damp cloth and a common household anti-static window cleaning agent.
Do not use harsh or abrasive cleaning agents.



NOTE:

Ensure that **no detergent** or cleaning agent residue is flushed into the cooling unit tank; excess foaming will occur.

Cleaning the Cutting Chamber

- Remove the clamping device(s).
- Thoroughly clean and lubricate the clamping device(s).
- Store the clamping device(s) in a dry place or replace on the cutting table after cleaning.

- Clean the cutting chamber thoroughly:
 - Clean under the cutting table with the flushing gun and a brush to remove accumulated swarf behind the cutting unit.

Cooling Unit

- Check the level of the cooling water after 8 hours use or at least every week.

Monthly Maintenance


Replacing the Cooling Fluid

- Replace the cooling fluid in the Recirculation Cooling Unit at least once a month.



CAUTION

Avoid skin contact with the **additive** for cooling fluid.

Do not press FLUSH  until the flushing gun points into the cutting chamber.



NOTE:

Use of gloves is recommended when flushing and cleaning the machine.

Use of safety goggles is recommended when using the flushing gun. Only use the flushing gun for cleaning *inside* the cutting chamber.

Maintenance of Clamping Devices



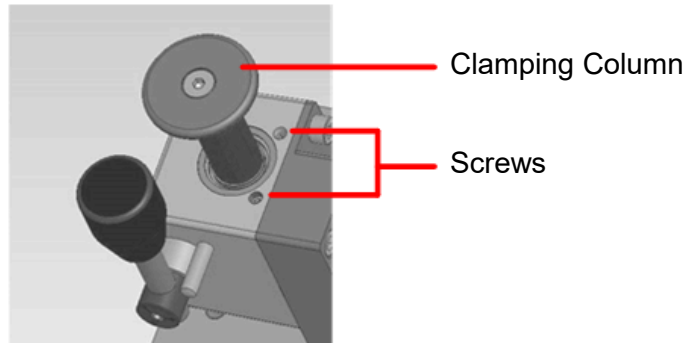
NOTE:

It is recommended to thoroughly clean and lubricate the Clamping Devices at regular intervals.

Adjusting the Clamping Column

Maintenance of the Clamping Devices is part of the regular yearly Struers Service. For details on adjustments and maintenance, consult Struers.

Should the clamping column require a slight adjustment to improve holding of the workpiece:



- Adjust the two clamping column screws using a 3mm Allen key. Carefully turn each screw a $\frac{1}{4}$ of a turn.
- Repeat if required.



NOTE:

The screws must exert an even pressure on the clamping heart. Make sure that both screws are adjusted equally i.e. the same number of turns.

Maintenance of Cutting Tables

The stainless-steel bands (available as spare parts) should be replaced if damaged or worn.

Maintenance of Cut-off Wheels Storing of Conventional Cut-off Wheels

These cut-off wheels are sensitive to humidity. Therefore, do not mix new, dry cut-off wheels with used humid ones. Store the cut-off wheels in a dry place, horizontally on a plane support.

Maintenance of Diamond and CBN Cut-off Wheels

The precision of diamond and CBN cut-off wheels (and thus the cut) depends on how carefully the following instructions are observed:

- Never expose the cut-off wheel to a heavy mechanical load, or heat.
- Store the cut-off wheel in a dry place, horizontally on a plane support, preferably under light pressure.
- A clean and dry cut-off wheel does not corrode. Therefore, clean and dry the cut-off wheel before storing. If possible, use ordinary detergents for the cleaning.
- Regular dressing of the cut-off wheel is also part of the general maintenance.

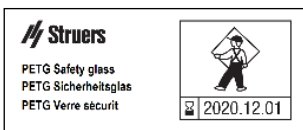
Yearly

Inspection of Cover

Part of Struers ServiceGuard

The protective cover consists of a metal frame and a composite material (PETG) screen that protects the operator. In the event of damage, the screen will be weakened and offer less protection.

Replacing the screen in the Cover



Replace the cover **immediately** if the PETG screen has been weakened by collision with projectile objects or if there are visible signs of deterioration or damages.

Inspection of the cover and replacement of the screen are part of **ServiceGuard**, the Struers range of service plans.

WARNING

To ensure its intended safety, the cover must be replaced every 5 years³. A label on the screen indicates when the cover is due to be replaced.

³ Replacement of the screen is required to remain compliant with the safety requirements in the European standard EN 16089.

Cleaning the Flush Gun Nozzle

The nozzle of the flushing gun, may collect swarf inhibiting the flow of cooling fluid.

To clean:

- Unscrew the nozzle with a shifting spanner and rinse under clean, running water.

Testing Safety Devices

The cover has a safety switch system to prevent the cut-off wheel from starting while the cover is open. Furthermore, a locking mechanism prevents the operator from opening the cover until the cut-off wheel stops spinning.



NOTE:

Testing should always be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).

Emergency Stop

- Start a cutting process.
- Activate the Emergency-stop.
If cutting does not stop, press STOP \diamond and contact Struers Service.
- Activate the Emergency-stop.
- Press START \diamond .
If cutting starts, press STOP \diamond and contact Struers Service.

Protective Cover

- Open the cover.
- Check that the cover stays up, in the open position.
If the cover does not stay up, contact Struers Service.
- Press START \diamond .
If cutting starts, press STOP \diamond and contact Struers Service.
- Start a cutting process.
- Try to open the cover – do NOT use force.
If it opens, press STOP \diamond and contact Struers Service.
- Start a cutting process.
- Press STOP \odot .
There is a 4 s delay from pressing stop and the cover unlock.
If it is possible to open the cover while the cut-off wheel still rotates, contact Struers Service.

Fluid System

- Open the cover.
- Press FLUSH ☞ to activate the water pump and the flushing gun.
If cooling fluid starts to run from the cut-off wheel guard, press STOP \diamond and contact Struers Service.
- Activate Emergency stop.
- Press FLUSH ☞ to activate the water pump.
If cooling fluid starts to run, press STOP \odot and contact Struers Service.



WARNING

Do NOT use the machine with defective Safety Devices.
Contact Struers Service.

Spare Parts

A list of selected wear parts that may need replacement during the lifetime of the machine can be found in the [Spare Parts and Diagrams](#) in the Reference Guide section of the Instruction Manual.

4. Cautionary Statements

List of Safety Messages in the Manual



CAUTION

The machine is heavy. Always use crane and straps.



ELECTRICAL HAZARD

The machine must be earthed (grounded).
Switch the power off when installing electrical equipment.
Check that the mains voltage corresponds to the voltage stated on the type plate on the side of the machine.
Incorrect voltage may result in damage to the electrical circuit.



CAUTION

Prolonged exposure to loud noises may cause permanent damage to the hearing,
Use hearing protection if exposure to noise exceeds levels set by local regulations.




CAUTION

Risk of hand to arm vibration during manual cutting.
Prolonged exposure to vibration may cause discomfort, joint damage or even neurological damage.



CAUTION

Avoid skin contact with the additive for cooling fluid.
Do not press FLUSH  until the flushing gun points into the cutting chamber.



CAUTION

The protective cover will minimize the risk of ejection but will not eliminate them completely.



WARNING

To ensure its intended safety, the cover must be replaced every 5 years⁴. A label on the screen indicates when the cover is due to be replaced.

⁴ Replacement of the screen is required to remain compliant with the safety requirements in the European standard EN 16089.



WARNING

Do NOT use the machine with defective Safety Devices.
Contact Struers Service.



ELECTRICAL HAZARD

Disconnection of the power supply may only be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.)



WARNING

Safety critical components are to be replaced after a maximum lifetime of 20 years.
Contact Struers Service for information.

5. Transport and Storage



NOTE:

Store the packing crate, foam packaging, bolts and fittings for use whenever Labotom is transported/re-located. Failure to use the original packaging and fittings could cause severe damage to the tester and will void the warranty.

Follow these steps:

- Disconnect the power supply, Recirculation Cooling Unit and exhaust system.
- Move the Recirculation Cooling Unit.
- Place the lifting straps⁵ on the designated lifting points on the machine.
- Move it to its new position.

If the machine is bound for long-time storage or shipping, follow these steps:

- Place the machine on the original pallet.
- Secure the machine using the original transport brackets. Fasten the eight coach bolts with a torque bit T30 key.
- Build the crate.
- Place the accessories box and other loose items in the crate. To keep the machine dry, plastic wrap the machine and place a bag of desiccant (silica gel) with the machine, too.

At the new location, check that:

- The facilities required are in place (power and exhaust).
- Check the Pre-Installation Checklist (if it is lost, contact Struers for a copy)

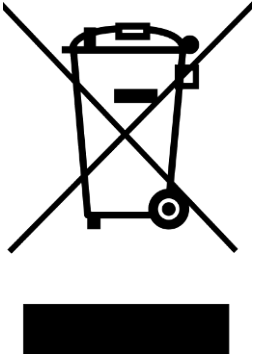



ELECTRICAL HAZARD

Disconnection of the power supply may only be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.)

⁵ Crane and straps must be approved of at least twice the weight of the load.

6. Disposal



Equipment marked with a WEEE symbol  contain electrical and electronic components and must not be disposed of as general waste.

Please contact your local authorities for information on the correct method of disposal in accordance with national legislation.

NOTE:

Swarf must be disposed of according to the current safety regulations for handling and disposal of swarf/ additive in the cooling fluid.

NOTE:

The cooling fluid will contain additive and cutting swarf and may **NOT** be disposed of into a main drain. Cooling fluid must be disposed of in compliance with local safety regulations.

Depending on which metals are being cut, it is possible that the combination of the metallic swarf (cutting debris) from metals with a large difference in electro positivity (a large distance apart in the electrochemical series), could result in exothermic reactions when 'favourable' conditions are present.

Therefore, it is always good practice to bear in mind which metals are being cut and the amount of swarf produced.

Examples:

The following are examples of combinations which could result in exothermic reactions if a large amount of swarf is collected during cutting/ grinding on the same machine, and when favourable conditions are present:

Aluminium and Copper

Zinc and Copper

Reference Guide

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1. Struers Knowledge

Materialographic sectioning is where most microstructure analysis begins. A good understanding of the abrasive cutting process can help to select suitable clamping and cutting methods and thereby ensure the high-quality cut. Minimizing cutting artefacts will help the remaining materialographic process and act as a good base for efficient and high-quality preparation.



HINT:

It is recommended to thoroughly clean and lubricate the Clamping Devices at regular intervals.

For further information, see the section on [Cutting](#) on the Struers website.

2. Advanced Operations

Clamping Irregular Workpieces

Irregular workpieces without plane clamping surfaces must be clamped using special clamping tools, as the workpieces must not move during the cutting. This could result in damage to the cut-off wheel or to the workpiece itself. Use the T-slots to mount the special clamping tools.

Struers offers a selection of Clamping Tools (Please refer to the [Labotom-15 brochure](#) or the [Struers Clamping Tools brochure](#) for details of the range available).

To achieve faster cutting, position the workpiece so that the wheel will cut the smallest possible cross-section.

Long Workpieces

To cut workpieces exceeding the width of the cutting chamber in the left-hand side, a plate in the cover may be removed and replaced by an [Extension Box](#).

Cutting Long Workpieces

- Place the workpiece in the Extension Box and clamp securely.

Cooling Nozzle Kit



Some special workpieces can be difficult to cool by using cooling water from the cut-off wheel guard i.e. tubes. A [Cooling Nozzle Kit](#) which has a flexible tube to spray the water inside the workpiece, is available as an accessory.

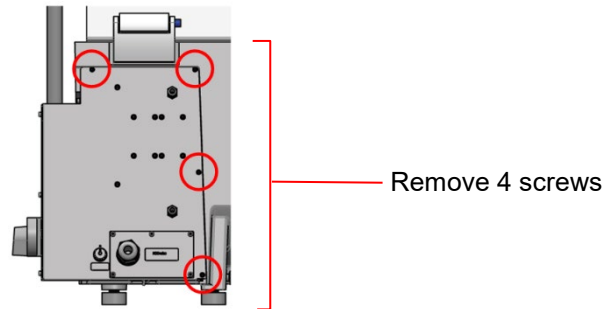
Two Cooling Nozzles can be mounted on Labotom-15.

- Mount the Cooling Nozzle on the cutting table using a T-slot nut.

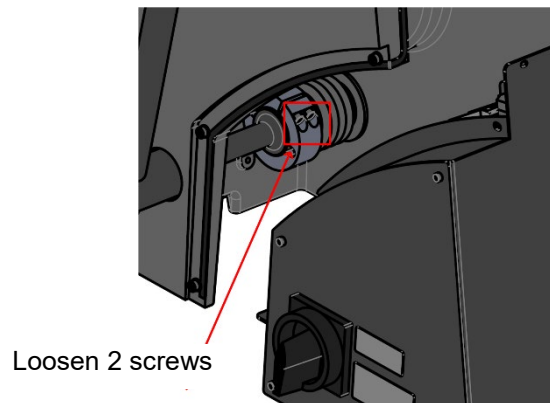
Adjusting the Cutting Handle

The cutting handle is factory-mounted in a position which will suit most people when Labotom-15 is placed on a table 800 mm high. However, it is possible to change the position of the cutting handle:

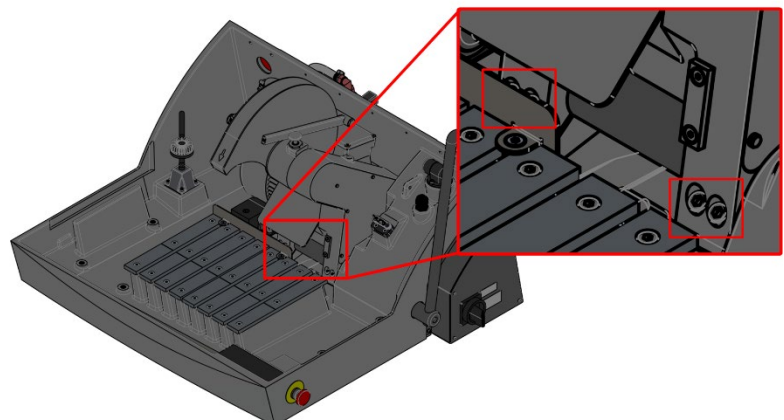
- Remove the 4 screws from the back of the hardware box on the rear of Labotom-15.



- Pull the hardware box away to access the axle.
- Loosen the 2 screws on the cutting arm spring.



- Loosen the 4 screws underneath the cutting motor. Take care not to displace the cutting motor axially.



- Turn the handle to the desired position.
- Tighten the screws.
- Check that the cut-off wheel will pass through the middle of the slot in the cutting table.

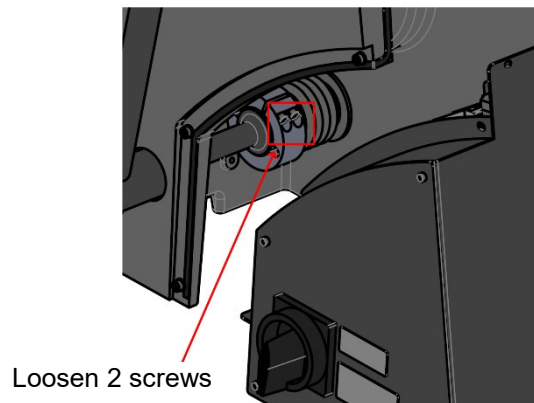
- Check the resistance of the tilting cutting unit (the balance) and adjust if necessary. See section below for details.

Adjusting the Tilting Cutting Unit

The tilting cutting unit should offer a slight resistance when being moved. Too much friction will be tiring during operation whilst too little might cause excessive vibrations during cutting. The friction is adjusted from the factory but may need a slight adjustment after a period of time.

To adjust the friction:

- Remove the 4 screws from the back of the hardware box on the rear of Labotom-15.



- Loosen the 2 screws on the cutting arm spring.
- Hold the cutting arm in position.
 - To **reduce** the friction on the cut-off wheel, rotate the cutting arm spring clockwise (towards the rear).
 - To **increase** the friction on the cut-off wheel, rotate the cutting arm spring counter-clockwise (towards the front).
- Tighten the screws and replace the hardware box.

Optimising the Cutting Results

The following table shows possible answers to a number of common questions:

Optimising the Cutting Results	
Question	Answer
How can I avoid discoloration or burning of the specimen?	Apply a lower cutting force
	Change the cut-off wheel as the hardness of the present cut-off wheel may be inappropriate for the hardness of the workpiece*)
How can I avoid burrs?	Use a softer cut-off wheel*)
	Where a Quick Clamping Device (optional) and spring clamp (optional) are mounted: Clamp the workpiece securely using the Quick Clamping Device. Position the spring clamp to provide a force just sufficient to prevent the cut-off piece from shifting at the end of the cutting action.
How can I avoid the cut-off wheels wearing too quickly?	Apply a lower cutting force or use a harder cut-off wheel*)
How can I achieve faster cutting?	Position the workpiece so as to cut the smallest possible cross-section. Apply a higher cutting force.

*) Please refer to the Selection Guide in the [Struers Cut-off Wheels brochure](#).

3. Accessories and Consumables

Accessories



Table unit

Specification	Cat. Nr.
<i>Extension Box for Labotom-15, left side</i> For extending the cutting chamber when cutting long workpieces. To be mounted on the left-hand side of Labotom-15. For workpieces with a maximum size of: 120 mm / 4.7" dia. or 200 x 90 mm / 8" x 3.5".	06056903
<i>Cooling Nozzle Kit</i> Cooling unit with one water jet for flexible cooling of the workpieces.	06056902
<i>Table unit</i> With shelves for storage of cut-off wheels. WxDxH: 900 x 750 x 800 mm / 35.5 x 29.5 x 31.5"	06266101
<i>Extension for table unit</i> WxD: 400 x 950 mm / 15.7 x 37.4"	06266901
<i>Filter Tube Connection Kit</i> For use with table unit	05766935

Please also refer to the [Labotom-15 brochure](#) for details of the range available.

Clamping Tools

Please refer to the [Struers Clamping Tools brochure](#) for details of the range available.

Other Accessories

Specification	Cat. Nr.
<i>T-slot cleaner</i> T-slot cleaner for 10 & 12mm T-slots	05486910

Consumables

The use of Struers consumables is recommended. Other products (e.g. coolants) may contain aggressive solvents, which dissolve e.g. rubber seals. The warranty may not cover damaged machine parts (e.g. seals and tubes), where the damage can be directly related to the use of non-Struers consumables.

Cut-off Wheels

Please refer to the Selection Guide in the [Struers Cut-off Wheels brochure](#).

Other Consumables

Specification	Cat. No.
<i>Corrozip</i> Additive for Cooling Fluid. 1 l 5 l	 49900045 49900046
<i>Corrozip-Cu</i> Additive for Cooling Fluid. For machines which mainly cut copper and copper alloys. 1 l 5 l	 49900068 49900069
<i>Unitclean</i> For cleaning of Recirculation Cooling Units to stop attack of micro-organisms and remove unpleasant odours. 1 l	 49900040
<i>Struers Cleaner</i> For heavy duty cleaning.	49900027

4. Trouble-Shooting

Error	Explanation	Action
Machine Problems		
The cut-off wheel does not rotate.	The cover is open.	Press the cover completely down. If this does not help: Contact Struers Service.
	The safety lock release has been de-activated.	Re-activate the safety lock release before operating Labotom-15.
	Cutting motor overloaded due to heavy use.	Open the cover and let the cutting motor cool down for about 5 - 10 min.
No cooling water.	Valve on back is clogged or disconnected.	Check the water valve. If necessary, unscrew the valve and clean under running water. If this does not help: Contact Struers Service.
	Electrical connection from machine to recirculation unit is open or recirculation unit is switched OFF	Check cable is connected, and recirculation unit is switched ON. Pump must run when cutting process starts
	Water level in recirculation unit is low.	Fill the cooling fluid into the recirculation unit tank
No water from the flushing gun.	Valve is closed.	Open the valve on the flushing gun.
	The flushing gun is clogged.	Clean inside the flushing gun with water and compressed air. If this does not help: Contact Struers Service.
Workpieces or cutting chamber rusty.	Insufficient additive for cooling fluid.	Add Struers additive Corrozip to the cooling water, using the correct concentration. Please follow the instructions in the Recirculation Cooling Unit Instruction Manual.
	The machine is left with closed cover.	Leave the cover open to let the cutting chamber dry.
Cover window blurred.	Insufficient cleaning.	Clean with mild soapy water. NOTE: The soapy water must not run down into the recirculation tank as this will cause the water to foam.
Quick Clamping Device unable to hold the workpiece.	The Quick Clamping Device is not balanced.	Adjust the two clamping column screws. See the section on Adjusting the Clamping Column for details.
	Clamping heart worn.	Contact Struers Service.

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Error	Explanation	Action
Cutting Problems		
Discoloration or burning of the workpiece.	The hardness of the cut-off wheel is inappropriate for the hardness / dimensions of the workpiece.	Please refer to the Selection Guide in the Struers Cut-off Wheels brochure .
	The force on the cut-off-wheel is too high.	Apply a lower force on the cut-off wheel.
	Inadequate cooling.	Check that there is enough water in the recirculation cooling unit. Check the flow of water from the recirculation cooling unit.
Unwanted burrs.	Wheel too hard.	Please refer to the Selection Guide in the Struers Cut-off Wheels brochure .
	Too high force on the cut-off wheel near the end of the operation.	Reduce the cutting force near the end of the operation.
	Lack of support.	If possible, support the workpiece on both sides.
The cutting quality differs.	Cooling water tube clogged.	Check the flow of water from the recirculation cooling unit.
	Insufficient cooling water.	Refill tank with water. Remember Struers additive, Corrozip.
The cut bends to a side.	Initial cutting rate too fast.	Let the cut-off wheel make a small notch into the workpiece before the actual cutting is carried out.
	The force on the cut-off-wheel is too high.	Apply a lower force on the cut-off wheel.

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Error	Explanation	Action
The cut-off wheel breaks.	Incorrect mounting of the cut-off wheel.	<ul style="list-style-type: none"> - Check that the hole has the correct diameter. - Check there is a cardboard washer on both sides of the cut-off wheel (Conventional cut-off wheels only). - Check that the nut is tightened securely.
	Incorrect clamping of the workpiece.	<p>Make sure that only one side of the workpiece is clamped securely. The other side should only be fixed lightly.</p> <p>Use support tools (optional) if the geometry of the workpiece makes support necessary.</p>
	Not enough support of the workpiece.	Support the free end of the workpiece.
The cut-off wheel breaks.	Cut-off wheel too hard.	Please refer to the Selection Guide in the Struers Cut-off Wheels brochure .
	The force on the cut-off-wheel is too high.	Apply a lower force on the cut-off wheel.
	Inadequate cooling.	<ul style="list-style-type: none"> - Check that there is enough water in the recirculation cooling unit. - Check the cooling water hoses.
The cut-off wheel wears down too quickly.	The force on the cut-off-wheel is too high.	Apply a lower force on the cut-off wheel.
	The cut-off wheel is too soft for the task.	Please refer to the Selection Guide in the Struers Cut-off Wheels brochure .
	Labotom-15 vibrates (worn bearings).	Contact Struers Service.
The cut-off wheel does not cut through the workpiece.	Incorrect choice of cut-off wheel.	Please refer to the Selection Guide in the Struers Cut-off Wheels brochure .
	Cut-off wheel worn.	Replace the cut-off wheel.
	The cut-off wheel gets caught in the workpiece because of internal stress in the workpiece.	<p>Support the workpiece and clamp it on both sides of the cut-off wheel in such a way to allow the cut to stay open.</p> <p>Make a relief cut: Cut about halfway through the workpiece. Turn the workpiece 180° and position the cut approx. 1 - 2 mm off-centre.</p>

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Error	Explanation	Action
The cut-off wheel vibrates during cutting.	Incorrect clamping of the workpiece.	Make sure that only one side of the workpiece is clamped securely . The other side should only be fixed lightly. (see page 21, Clamping Devices) Use support tools (optional) if the geometry of the workpiece makes support necessary.
	The cut-off wheel is too soft for the task.	Select a harder cut-off wheel. Please refer to the Selection Guide in the Struers Cut-off Wheels brochure .
	Not enough cutting force.	Exert more force on the cut-off wheel. Note: Large and/ or very hard workpieces may require operator strength to cut through.
	Cutting force too high.	Reduce the force on the cut-off wheel.
	Worn bearings.	Contact Struers Service.
	Certain workpieces can be difficult to clamp adequately and may result in resonance and vibration.	Contact Struers' Application Specialists for advice on clamping.
The workpiece breaks when clamped.	The workpiece is brittle.	Place the workpiece between two polystyrene plates. NB! Always cut brittle workpieces very carefully.
The workpiece is corroded.	The workpiece has been left in the cutting chamber for too long.	Leave the cover open when you leave the machine.
	Insufficient additive for cooling fluid.	Add Struers additive Corrozip to the cooling water in the correct concentration.
	The additive is not suitable for the application.	Add Struers additive Corrozip to the cooling water in the correct concentration.
Cutting chamber shows signs of corrosion.	The workpiece is made of Copper/ Copper Alloy.	Use Corrozip-Cu.
Forgotten pass code		Call Struers Service. It is necessary to revert to the factory settings of the software to regain access to the machine. Note: Stored information and pre-defined processes are lost.

5. Service

Struers recommends that a regular service check be carried out after every 1500 hours of use.

Struers offers a range of comprehensive maintenance plans to suit the requirements of our customers. This range of services is called **ServiceGuard**.

The maintenance plans include equipment inspection, replacement of wear parts, adjustments/calibration for optimal operation, and a final functional test.

Service and greasing of Labotom and the Quick Clamping Devices are part of a regular Struers Service Schedule. Struers recommends that a regular service check be carried out after every 1500 hours of use.

Please contact a Struers Field Service Engineer to service the machine.

6. Spare Parts and Diagrams

Safety Related Parts of the Control System (SRP/CS)

Safety Circuit / Control System	Description	Manufacturer Cat no.
Emergency Stop Safety Circuit	Emergency stop 22 type	RV Rondex
	Contact block NC	MTO
	Safety relay unit	G9SB-3012-A
	Motor contactor	J7KN 40 24VAC
Interlocking Locking Device Safety Circuit	Solid-state Multi-functional Timer	H3DS-ML
	Solenoid interlock	AZM 161SK-12/12RK-024
Cover Interlock Safety Circuit	Safety relay unit	G9SB-3012-A
	Safety hinge with screws M12	HP AB052D-KAM
	Solenoid interlock	AZM 161SK-12/12RK-024
	Motor contactor	J7KN 40 24VAC
Cooling Liquid Safety Circuit	Emergency stop 22 type	RV Rondex
	Contact block NC	MTO
	Coaxial solenoid valve, series 287 Brass body 2/2 NC G3/8 D=10 Complete 24V DC	SC G287A001.24/50
	Power Plug-in Relay	G2R-1-S
Other Control Systems	PETG screen and Cover Assembly	Struers manufact.
	Protection guard assembly	Struers manufact.

Struers' Cat. nos. are listed in the Spare Parts list.



NOTE:

The PETG screen must be replaced after a lifetime of 5 years.

Replacement of Safety critical components can only be performed by a Struers engineer or a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).

Safety critical components may only be replaced by components with at least the same safety level.

Contact Struers Service for information.

Spare Parts List

The following is a list of selected wear parts that may need replacement during the lifetime of the machine.

For further information, or to check the availability of other replacement parts, please contact your local Struers Service department. Contact information is available on Struers webpage

Spare Part	El. Ref.	Cat no:
Plate for T-rail, 2 pcs		R6050509
Protective cover, assembled		R6050020 *
Protective rubber curtain (rear)		R6050322
Gas damper for cover		RYS20099 **
Linear damper for cover w75		RYS20100
Torsion spring		R6050220
Fixed flange		R6050316
Flange		R6050317
DeskLED HP0 60D	HL1	RHW10060
Locking pin		R5480051
Motor contactor J7KN	K3, K5	2KM74011 *
Protection guard, assembled		R6050012 *
Key bracket w. key		R6050413 *
Contact block NC	S1.1, S1.2	2SB10071 *
Power plug-in relay	K1, K6	2KL20124 *
Emergency stop 22 type RV	S1	2SA10400 *
Solid-state Multi-functional Timer	KT1	2KT00003 *
Safety hinge with screws M12	SS1	2SS48085 *
Coaxial solenoid valve, Brass body, 24V DC	Y1	R6050018 *
Solenoid interlock AZM161 safety switch	YS1	2SS00121 *
Safety relay unit	KS1	2KS10006 *
Extension Tunnel, assembled		R6050060
Side door for Cover W. screws		R6059295



Information

* SRP/CS (Safety-related parts of a Control system). Parts that have an influence on safe operation of the machine.

** Other Safety-related parts



WARNING

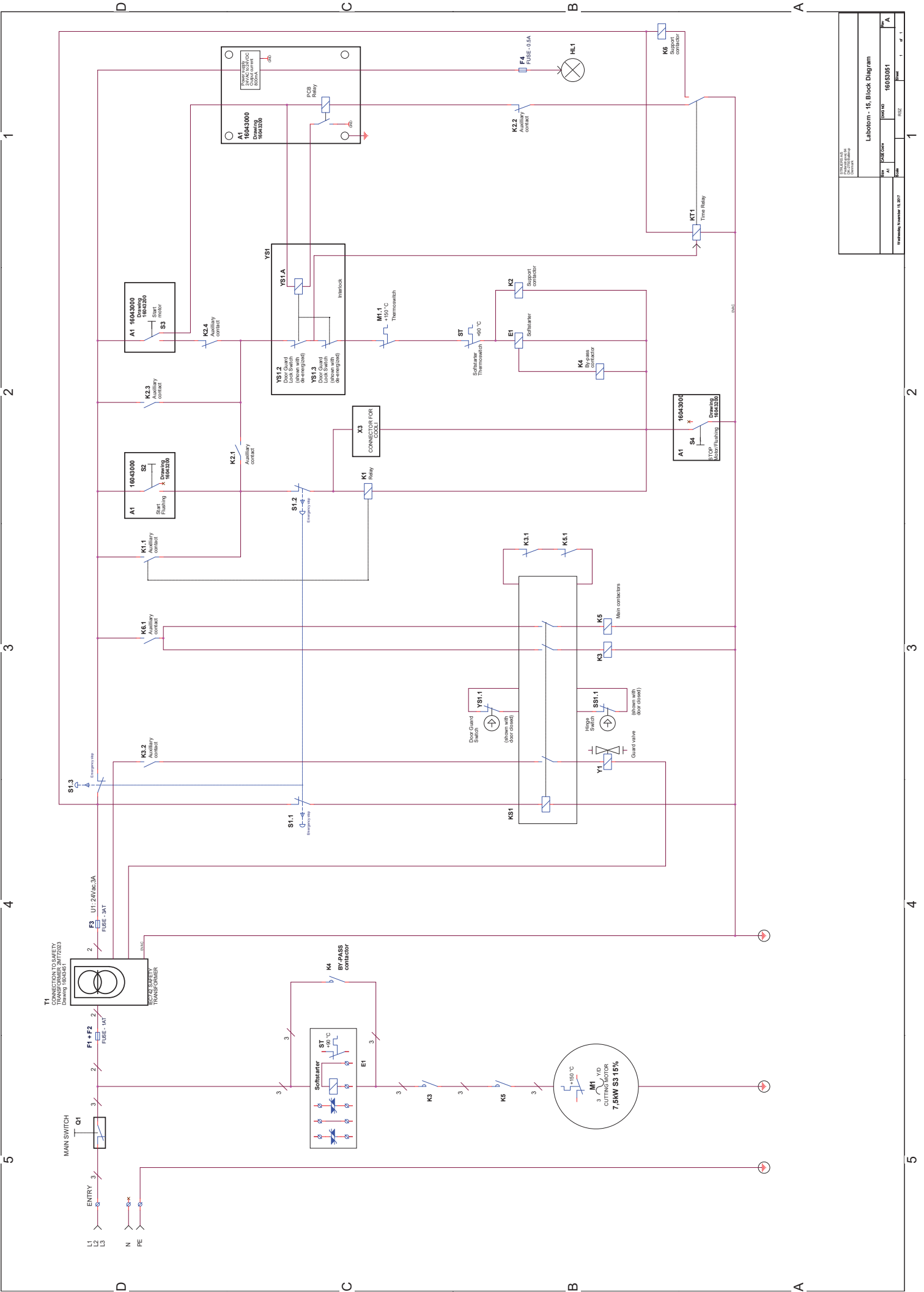
Safety critical components are to be replaced after a maximum lifetime of 20 years.

Contact Struers Service for information.

Diagrams

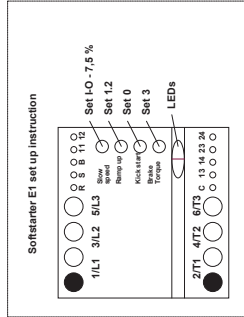
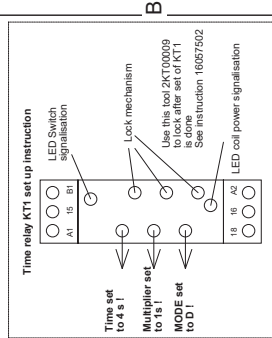
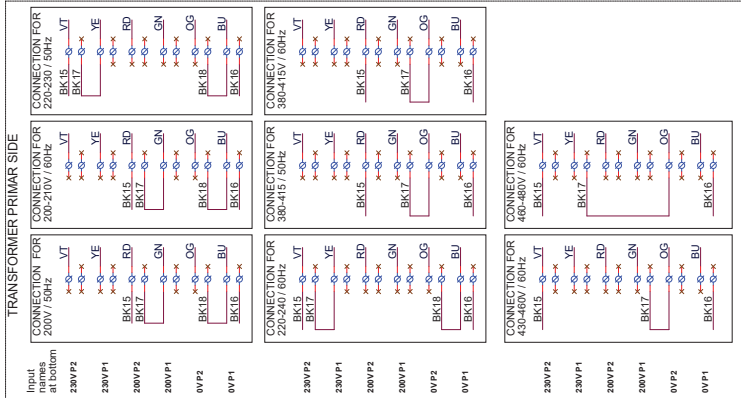
Labotom-15 Block Diagram	16053051
Labotom-15 Circuit Diagram (3 pages).....	16053101
Labotom-15, Water diagram.....	16051002

See the following pages.



16043203		16043203		16043203	
Drawing		Drawing		Drawing	
16043203		16043203		16043203	
16043203		16043203		16043203	
16043203		16043203		16043203	
16043203		16043203		16043203	

Labotom - 15, Block Diagram



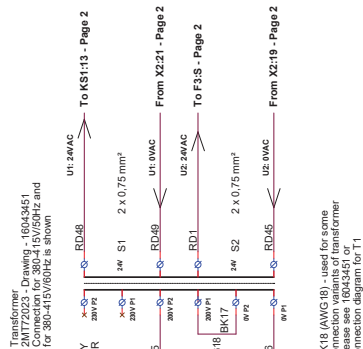
REVA 16031901 (16031901)

REV	DATE	DESCRIPTION	BY	CHK
1	16031901	Labotom - 15, Circuit Diagram - MAIN		

LABOTOM - 15, Circuit Diagram - MAIN

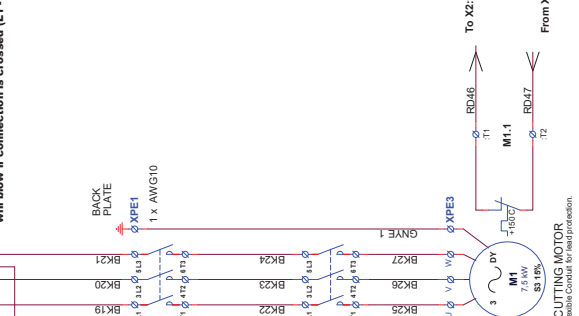
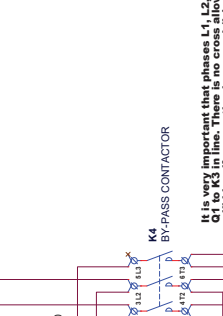
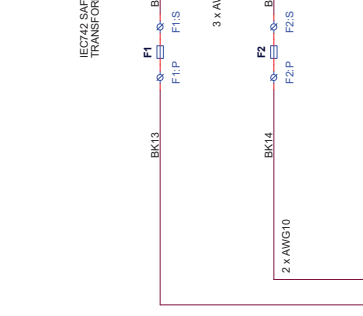
REV	DATE	DESCRIPTION	BY	CHK
1	16031901	Labotom - 15, Circuit Diagram - MAIN		

LABOTOM - 15, Circuit Diagram - MAIN



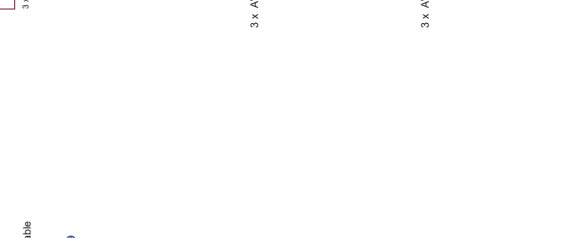
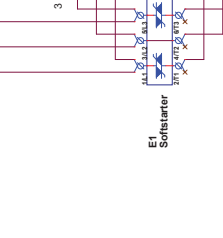
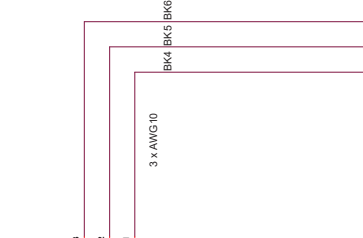
Note #8: F1 + F2 are time delay fuses CC - Class CC characteristic aM - aM characteristic

VOLTAGE / FREQUENCY (from transformer)	Min. cable cross-section	F1 + F2 cable size	Mt connection	Softstarter	Min. cable cross-section
3 x 230 V / 50 Hz	3 x 0.5mm ²	2 x 1AT (AM)	DELTA	SMBC 3 DA 2325	5 x 4mm ²
3 x 220-230 V / 50 Hz	3 x 0.5mm ²	2 x 1AT (AM)	DELTA	SMBC 3 DA 2325	5 x 4mm ²
3 x 220-230 V / 60 Hz	3 x 0.5mm ²	2 x 1AT (CC)	DELTA	SMBC 3 DA 2325	5 x 4mm ²
3 x 220-230 V / 60 Hz	3 x 0.5mm ²	2 x 1AT (CC)	DELTA	SMBC 3 DA 2325	5 x 10 AWG
3 x 380-480 V / 50 Hz	3 x 0.5mm ²	2 x 0.5AT (AM)	STAR	SMBC 3 DA 4025	5 x 2.5mm ²
3 x 380-480 V / 60 Hz	3 x 0.5mm ²	2 x 0.5AT (CC)	STAR	SMBC 3 DA 4025	5 x 12 AWG
3 x 480-480 V / 60 Hz	3 x 0.5mm ²	2 x 0.5AT (CC)	STAR	SMBC 3 DA 4025	5 x 12 AWG



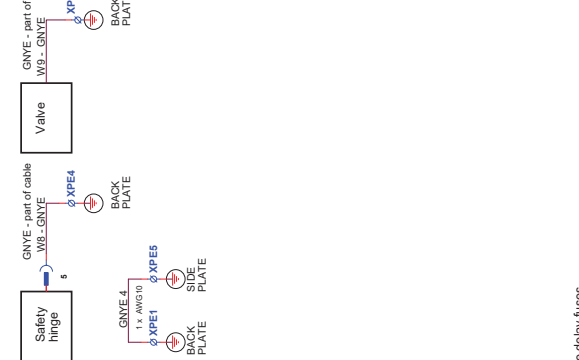
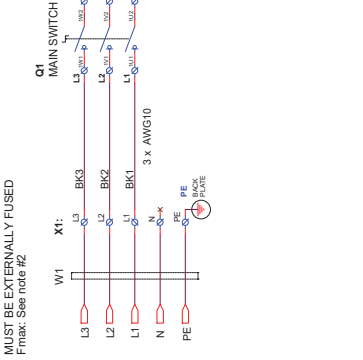
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3 x 220-230 V / 60 Hz	3 x 0.5mm ²	2 x 1AT (CC)	DELTA	SMBC 3 DA 2325	5 x 4mm ²
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3 x 480-480 V / 60 Hz	3 x 0.5mm ²	2 x 0.5AT (CC)	STAR	SMBC 3 DA 4025	5 x 12 AWG



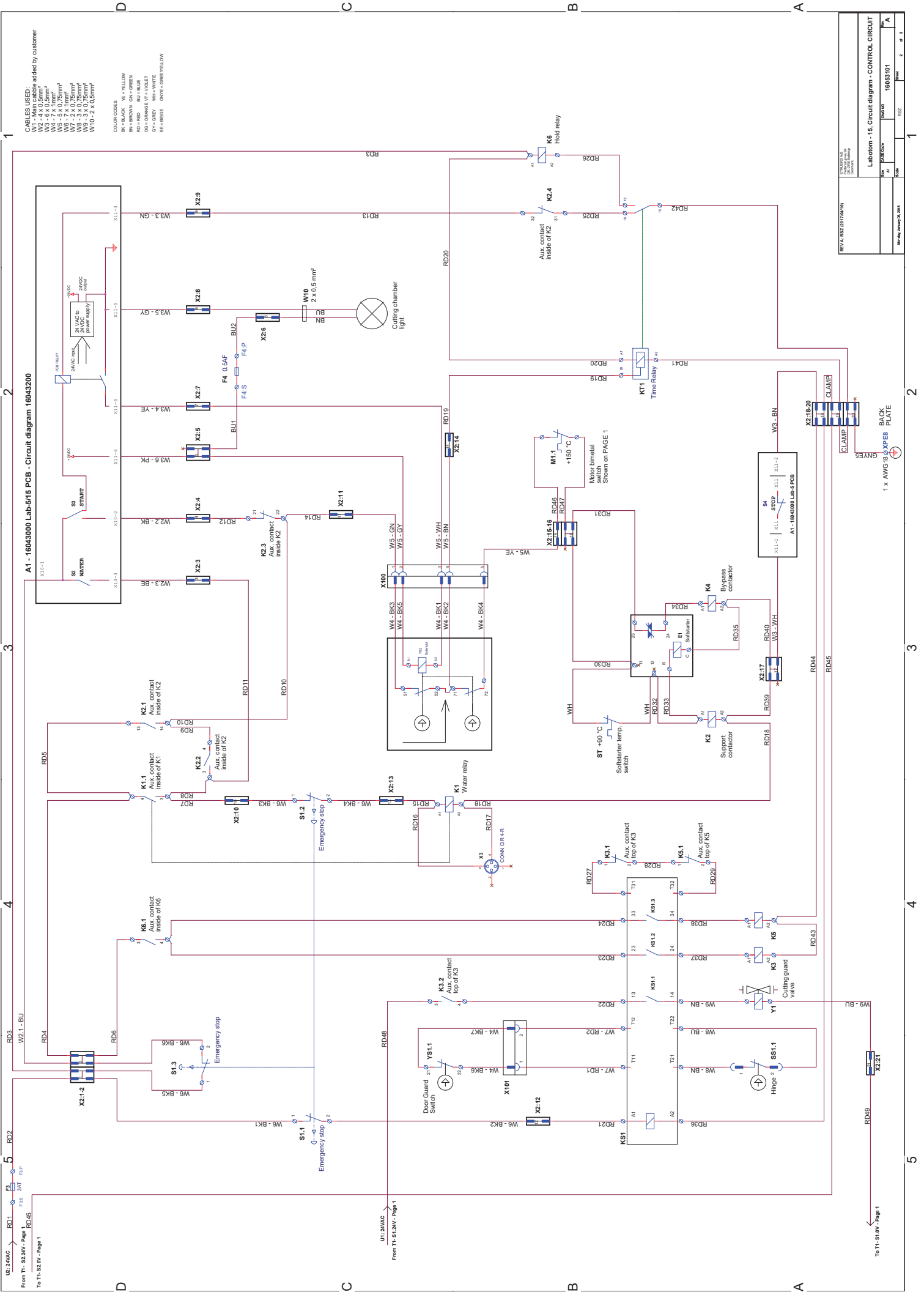
Note #8: F1 + F2 are time delay fuses CC - Class CC characteristic aM - aM characteristic

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3 x 220-230 V / 60 Hz	3 x 0.5mm ²	2 x 1AT (CC)	DELTA	SMBC 3 DA 2325	5 x 4mm ²
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3 x 380-480 V / 60 Hz	3 x 0.5mm ²	2 x 0.5AT (CC)	STAR	SMBC 3 DA 4025	5 x 12 AWG
3 x 480-480 V / 60 Hz	3 x 0.5mm ²	2 x 0.5AT (CC)	STAR	SMBC 3 DA 4025	5 x 12 AWG



Note #8: F1 + F2 are time delay fuses CC - Class CC characteristic aM - aM characteristic

VOLTAGE / FREQUENCY (from transformer)	Min. cable cross-section	F1 + F2 cable size	Mt connection	Softstarter	Min. cable cross-section
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3 x 480-480 V / 60 Hz	3 x 0.5mm ²	2 x 0.5AT (CC)	STAR	SMBC 3 DA 4025	5 x 12 AWG



CABLES USED:
W2 - 4 x 0.5mm²
W3 - 9 x 0.5mm²
W4 - 3 x 0.5mm²
W5 - 5 x 0.75mm²
W6 - 3 x 0.75mm²
W7 - 2 x 0.75mm²
W8 - 3 x 0.75mm²
W9 - 3 x 0.75mm²
W10 - 2 x 0.5mm²

COLOR CODES:
BR= BROWN GN= GREEN
RD= RED BU= BLUE
OG= ORANGE W= VIOLET
GY= GREY WH= WHITE
BL= BLACK GW= GREEN/YELLOW

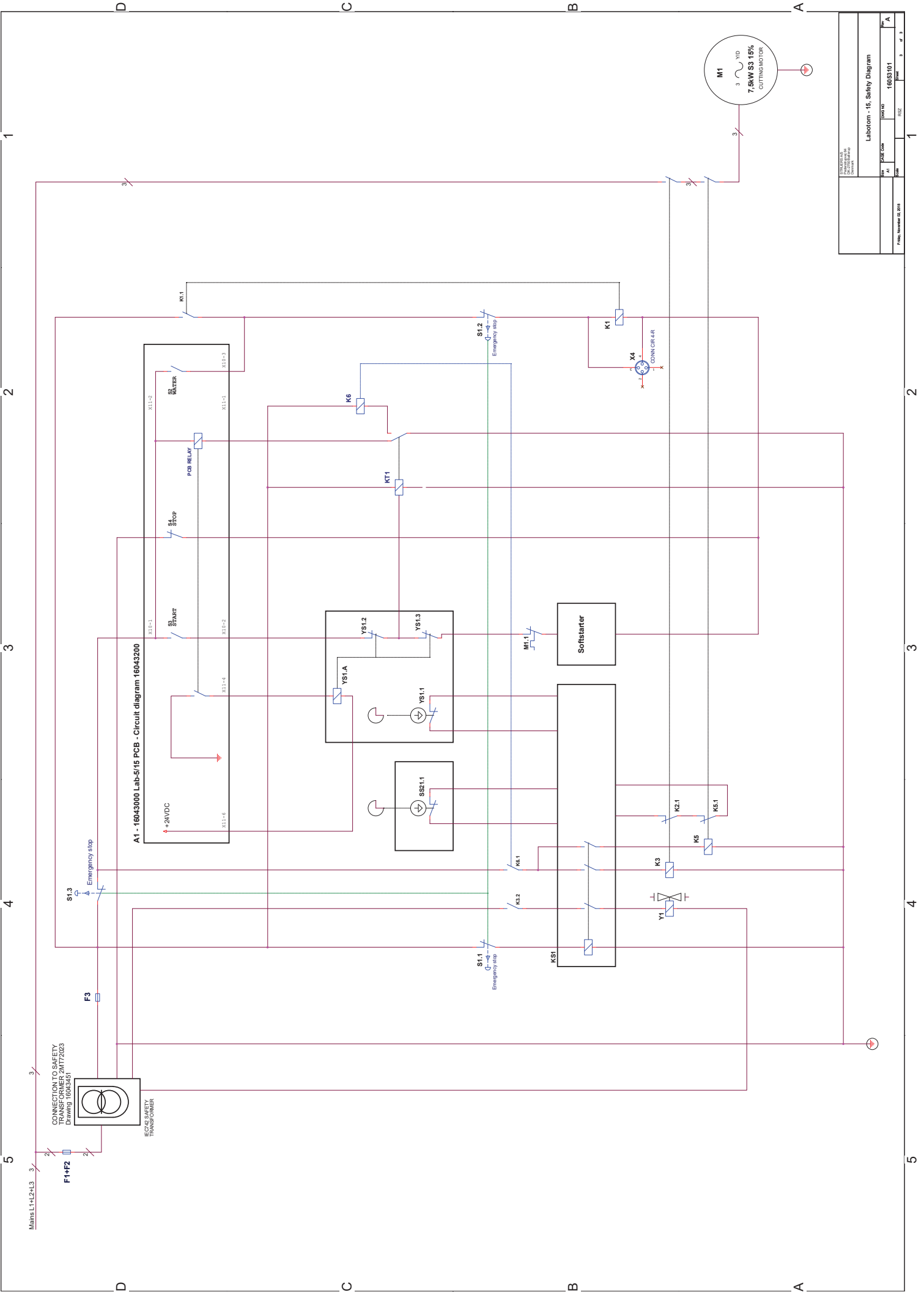
A1 - 16043000 Lab-5/15 PCB - Circuit diagram 16043200

REV: 16043200 (16043200)	DATE: 16043101	PAGE: 2	OF: 3
Labatom - 15. Circuit diagram - CONTROL CIRCUIT			
REVISED BY: [Signature]	DATE: 16043101		
DESIGNED BY: [Signature]	DATE: 16043101		
MOTOR: 16043200			

U1: 24VAC
From T1: S2.2AV - Page 1
To T1: S2.0V - Page 1

U1: 24VAC
From T1: S1.2AV - Page 1

To T1: S1.0V - Page 1



CONNECTION TO SAFETY TRANSFORMER ZMT17Z023 Drawing 16043451

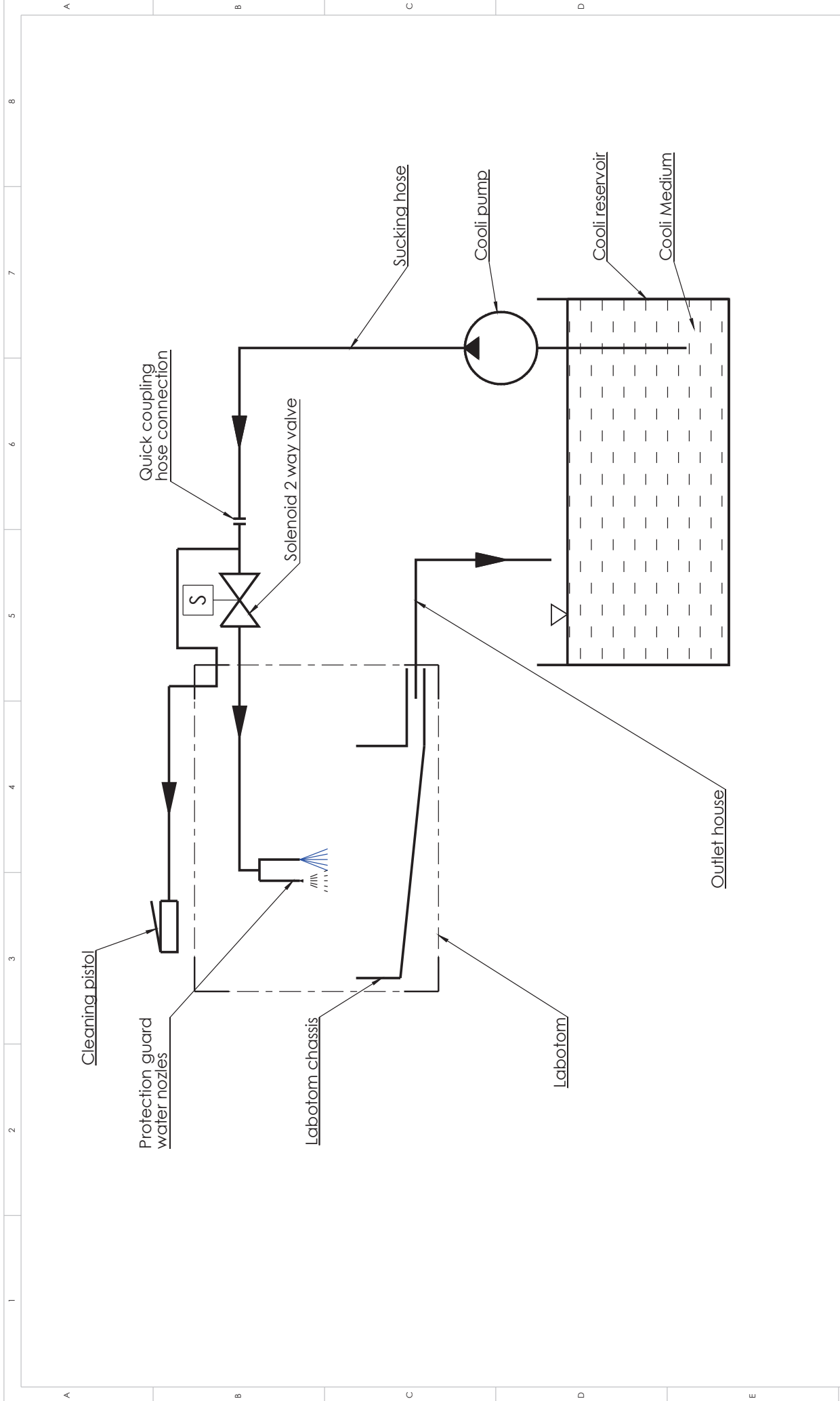
A1 - 16043000 Lab-5/15 PCB - Circuit diagram 16043200

M1 3 Y/D 7.5kW S3 15% CUTTING MOTOR

16043451 Drawing 16043451		16043200 Drawing 16043200	
16043451 Drawing 16043451	16043200 Drawing 16043200	16043451 Drawing 16043451	16043200 Drawing 16043200
16043451 Drawing 16043451		16043200 Drawing 16043200	
16043451 Drawing 16043451		16043200 Drawing 16043200	

Labotom - 15, Safety Diagram

16043451 Drawing 16043451	16043200 Drawing 16043200	16043451 Drawing 16043451	16043200 Drawing 16043200
16043451 Drawing 16043451		16043200 Drawing 16043200	
16043451 Drawing 16043451		16043200 Drawing 16043200	
16043451 Drawing 16043451		16043200 Drawing 16043200	



A	Revision	2011-05-06	Revision description	RMA	2017-10-02	RMA
	Creation date	yyyy-mm-dd		Draw. Init	Appr. date	Appr. Init
				Format:	Tolerance: DS/ISO 2768-	Weight:
				Material:	A3	
				Scale:	-	
				ID:	Description:	Rev:
				16051002 Labotom-15, Water diagram		A



7. Legal and Regulatory

FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the Instruction Manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Pursuant to Part 15.21 of the FCC Rules, any changes or modifications to this product not expressly approved by Struers ApS could cause harmful radio interference and void the user's authority to operate the equipment.


EN ISO 13849-1

All SRP/CS are limited to a lifetime of 20 years. After expiration of this period, all components must be replaced.

8. Technical Data

Subject		Specifications	
		Metric/ International	US/Imperial
Cutting	Cutting power constant [S3 60%]	5.5 kW	8.8 HP
	Cutting power intermittent [S3 15%]	7.5 kW	11.4 HP
	Rotational speed (running idle)	2350 rpm	2350 rpm
	Wheel speed (running idle), cut-off wheel 350 mm dia.	43 m/s	96 mph
Cut-off Wheel	Diameter x thickness x hole	350 x 1.5 - 2.5 x 32 mm	14 x 0.06 - 0.1 x 1.26"
Flange for Cut-off Wheel	Diameter	62.5 mm	2.5"
Cutting Chamber	<i>Dimensions</i>	Please see drawing on page 65 .	
	<i>Passage for protruding workpieces:</i> At left hand side		
	Width x Height Diameter	200 mm x 90 mm 120mm	8 " x 3.5" 4.7"
Cutting Table	Width	386 mm	15"
	Depth	300 mm	12"
	T-slots	10 mm, 8 pcs	
Cutting Capacity	Max. cutting diameter For other dimensions: Please see illustration on page 66 . (The actual cutting capacity depends on the workpiece material, cut-off wheel and clamping technique).	80 mm	3.1"
Fume Extraction	Dia. for connecting tube	50 mm	2.0"
	Recommended capacity: at 0mm /0" water gauge	50 m ³ /h	1750 ft ³ /h
Dimensions and Weight	<i>Labotom-15</i>		
	Width	965 mm	38.0"
	Width with handle	1161 mm	45.7"
	Depth	906 mm	35.7"
	Height	660 mm	26"
	Height, open cover	1045 mm	41.1"
	Weight	180 kg	397 lbs

*Labotom-15
Instruction Manual*

Subject		Specifications
EU Directives		Please refer to the Declaration of Conformity
Noise level⁶	A-weighted sound emission pressure level at workstations (Labotom-15)	L _{WA} = 72.75 dB(A), Uncertainty K = 4 dB(A) Measurements made in accordance with EN ISO 11202
Vibration		Total vibration exposure to upper parts of the body does not exceed 2.5 m/s ²
Operating Environment	Surrounding temperature	5 – 40°C / 40 – 105°F
	Humidity	35 – 85 % RH non-condensing
Storage	Surrounding temperature	0 – 60 °C / 32 – 140 °F
	Humidity	0 – 90 % RH non-condensing
Electrical Data	Voltage/frequency	Max. Load
	3x200 / 50	47 A
	3x220-230 / 50	42 A
	3x380-415 / 50	24 A
	3x200-210 / 60	44 A
	3x220-240 / 60	39 A
	3x460-480/60	24 A
	NOTE: Labotom-15 must be protected with external fuses, please see above for the fuse size required.	

⁶ Noise level: The figures quoted are emission levels and are not necessarily safe working levels. While there is a correlation between the emission and exposure levels, this cannot be used reliably to determine whether or not further precautions are required. Factors that influence the actual level of exposure of the workforce include characteristics of the work room, the other sources of noise, etc., i.e. the number of machines and other adjacent processes. Also, the permissible exposure level can vary from country to country. This information, however, will enable the user of the machine to make a better evaluation of the hazard and risk.

Mains Cable Specification*

Voltage / frequency:	Min. Fuse size	Minimum cable size @ Min. fuse	Max. Fuse size	Minimum cable size @ Max. fuse
3x200/50	40 A	3x4.0mm ² + PE + N	50 A	3x4.0mm ² + PE + N
3x220-230/50	40 A	3x2.5mm ² + PE + N	50 A	3x4.0mm ² + PE + N
3x380-415/50	32 A	3x1.5mm ² + PE + N	40 A	3x2.5mm ² + PE + N
3x200-210/60	40 A	3x8AWG + PE + N	50 A	3x8AWG + PE + N
3x220-240/60	40 A	3x10AWG + PE + N	50 A	3x10AWG + PE + N
3x460-480/60	30 A	3x14AWG + PE + N	40 A	3x12AWG + PE + N



NOTE:

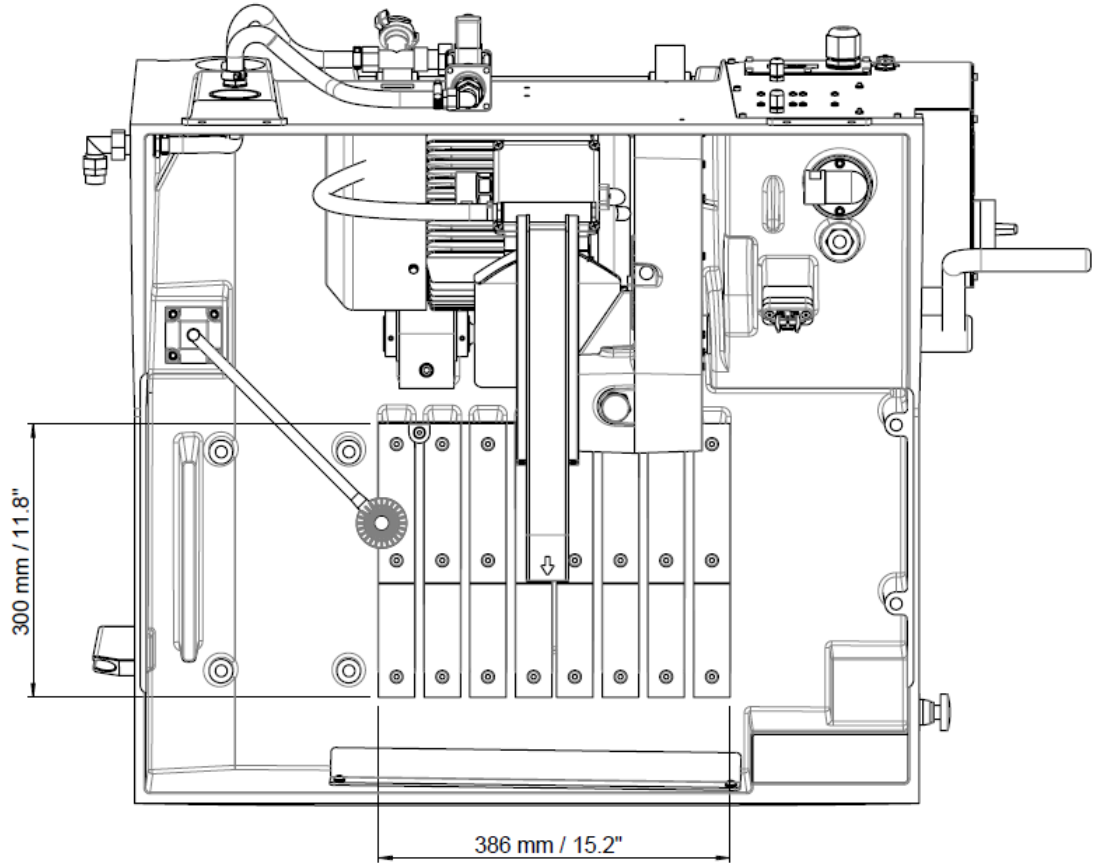
Local standards may overrule the recommendations for the main supply cable.

If necessary, please contact a qualified electrician to verify which option is suitable for the local installation setup.

Residual Current Circuit Breaker Type A, 30 mA (or better) is recommended.

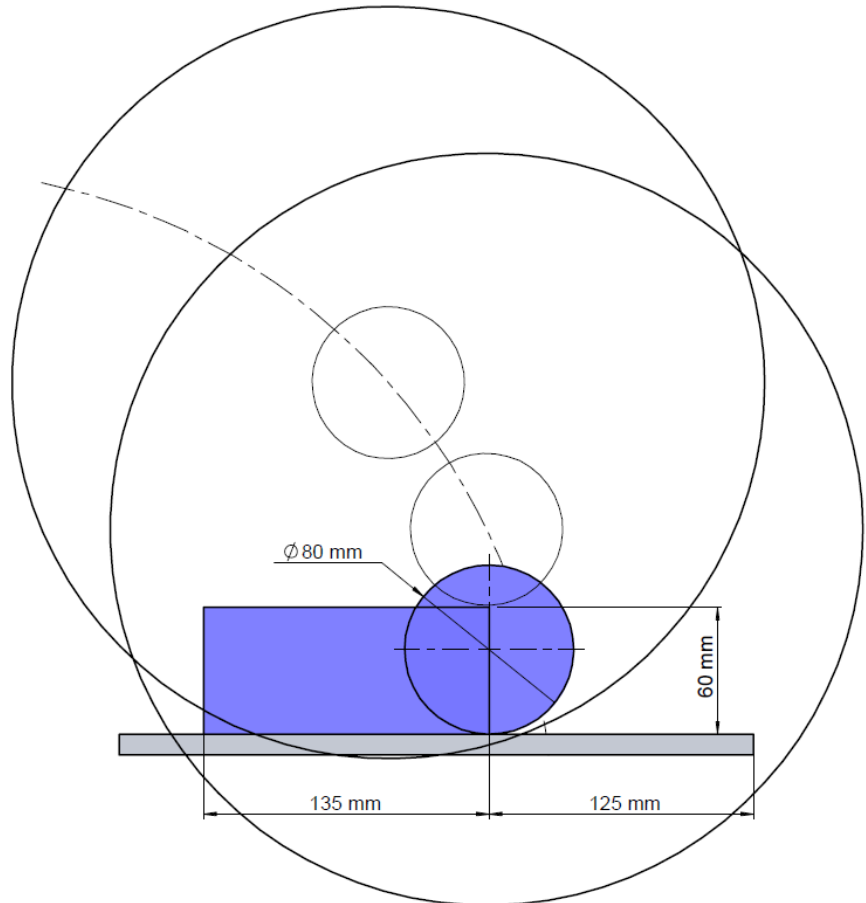
Labotom-15
Instruction Manual

Cutting Table Dimensions



Workpiece Dimensions

The drawing shows the projected cutting capacity in mm under the following conditions:
A new cut-off wheel. The workpiece is laid directly on the cutting table.
A Vertical Clamping Tool is used.



The actual cutting capacity depends on the workpiece material, cut-off wheel and clamping technique.
In particular, Labotom-15 is suitable for sectioning rods, tubes and pipes of up to 80 mm.



HINT:



Certain workpieces can be difficult to clamp adequately and may result in resonance and vibration.
Please see [Trouble-Shooting](#) for advice.

Quick Reference

Clamping the Workpiece

- Place the workpiece in a suitable clamping tool on the left hand side of the cutting table.
- Make sure that the workpiece is clamped securely.

Starting/Stopping the Cutting

- Close the cover.
- Press START . The cut-off wheel starts rotating and the cooling water starts running.
- Lower the cut-off wheel onto the workpiece by pulling the cutting handle slowly until contact with the workpiece. Do not apply too heavy a cutting force.
- Let the cut-off wheel make a small notch in the workpiece. Increase the pressure and keep it constant while cutting.
- When the cut-off wheel is almost through the workpiece the cutting pressure should be reduced.
- After cutting, return the cut-off wheel to back position. Stop the cut-off wheel and the cooling water by pressing STOP .
- Open the cover and release the clamping tool.
- Remove the cut specimen and the workpiece.



Dismounting a Cut-off Wheel

- Push the cutting handle backwards to place the tilting cutting unit in the back position.
- Press the pin for the spindle lock on the right-hand side of the cut-off wheel guard, turning the cut-off wheel until the spindle lock clicks.
- Remove the nut with the spanner. Remove the spring washer, flange and old cut-off wheel.

Mounting a Cut-off Wheel

- Leave the cutting unit in the backwards position.
- Put the cut-off wheel into the groove in the guard and catch the hole in the cut-off wheel with the spindle.
- Mount the flange, spring washer and nut.
- Press the pin for the spindle lock on the right-hand side of the cut-off wheel guard, turning the cut-off wheel until the spindle lock clicks.
- Tighten the nut securely with the spanner and release the spindle lock.


Cleaning the Cutting Chamber

- Press the handle of the flushing gun and remove the gun from the holder.
- Point the gun into the cutting chamber.
- With the flushing gun handle pressed in, press FLUSH  to start flushing.
- Gradually release the handle on the flushing gun and clean the cutting chamber. Adjust the flow as needed.
- Press STOP  to stop flushing.
- Place the flushing gun in the holder.
- Leave the cover open to let the cutting chamber dry completely.

Labotom-15, Pre-Installation Checklist

Read the Installation instructions in the Instruction Manual *before* installing the machine.

Installation Requirements

- Crane and 2 lifting straps, approved to at least twice the weight of the load
- Screwdriver/ bit: T30 Torx 
- Table - able to carry at least 200 kg/ 440 lbs kg
- Electrical cable (4-lead or 5-lead) with three phases and one earth connection (see table on page 5 for details)
- External Short Circuit Protection (see table on page 5 for details)
- Residual Current Circuit Breaker (see table on page 5 for details)

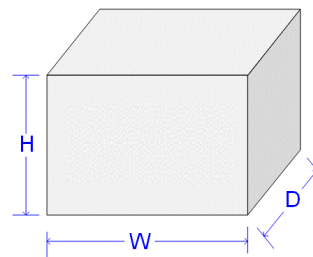
Required Accessories and Consumables (ordered separately)

- Cut-off Wheels and Clamping Tools, see page 7
- Recirculation cooling unit
- Additive for recirculation cooling unit

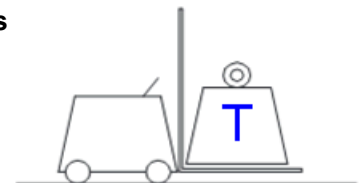
Recommended

- Exhaust system: 50m³/h / 1,750ft³/h at 0mm/0" water gauge

Crating specifications

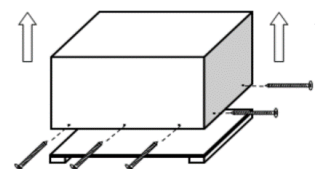


Weight (T): **230 kg / 507 lbs**
Height (H): 85 cm / 33.5"
Width (W): 120 cm / 47"
Depth (D): 104 cm / 41"



Unpacking

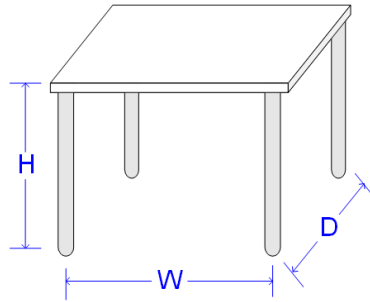
- Carefully open and remove the sides and the top of the packing crate.
- Remove the transport brackets securing the machine to the pallet.



Location

Recommended dimensions

The machine must be placed close to the power supply.
The machine is designed to be placed on a table unit.
The table must be able to carry at least 200 kg / 440 lbs.



Height (H): Local preference
Width (W): 92 cm / 36.2"
Depth (D): 90 cm / 35.4"

Recommended workbench dimensions. Height of table (H) follows local preferences.

A table unit designed for Struers' table top cut-off machines is available as an accessory Cat. No. 06266101. The Recirculation cooling unit fits into a compartment in the table unit.

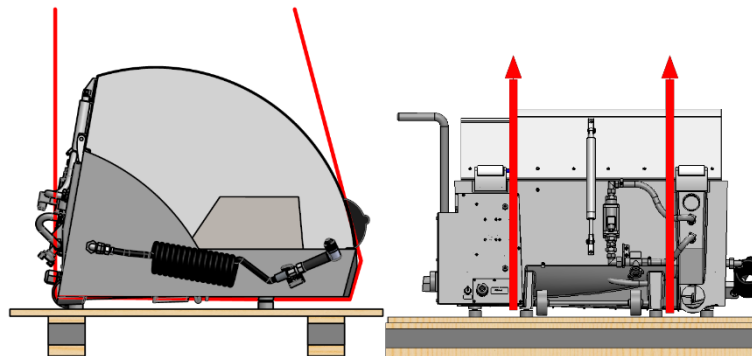
For other tables, check there is enough space under/ at the side of the table for a Recirculation cooling unit.

Lifting

Weight: 180 kg / 397 lbs

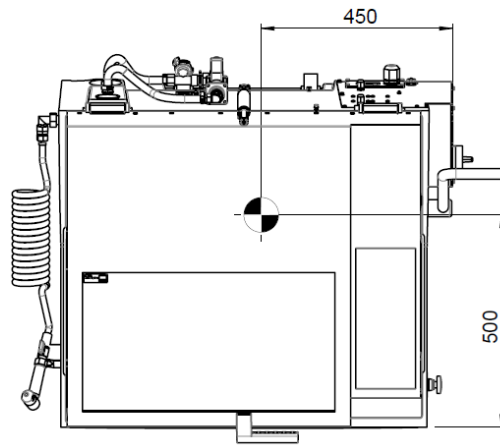
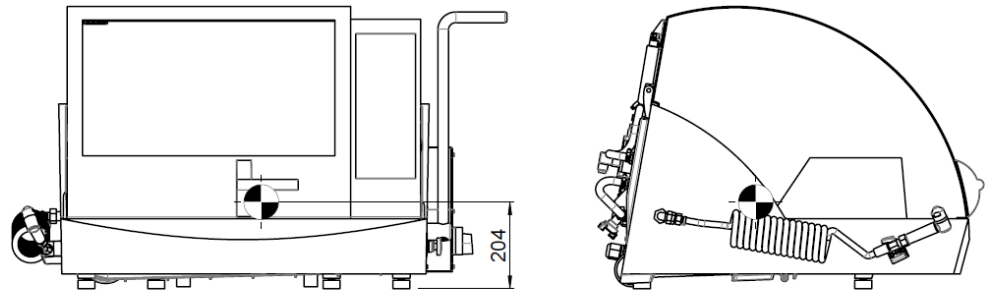
A crane, 2 lifting straps and a lifting bar are required to lift Labotom-15 off the shipment pallet.

- Place the two lifting straps under Labotom-15.
 - Position the back strap on the inner side of the feet.
 - Position the front strap on the outer side of the feet.
- Check that the straps are parallel to each other and position the lifting bar so that the two straps are kept apart below the lifting point.
- Check that the machine is resting securely with all 4 rubber feet on the table.

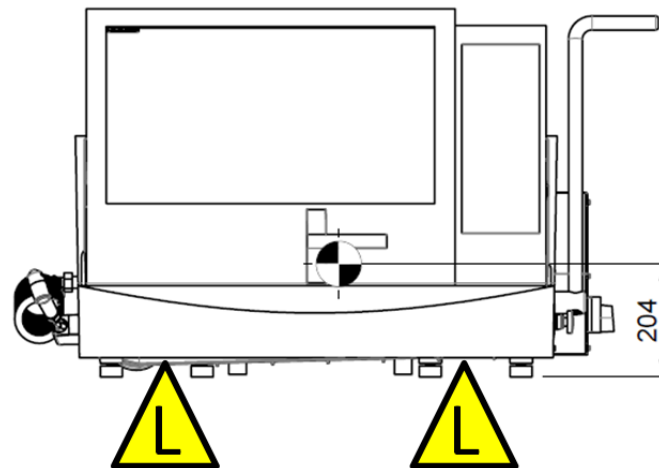


Dimensions

Centre of Gravity



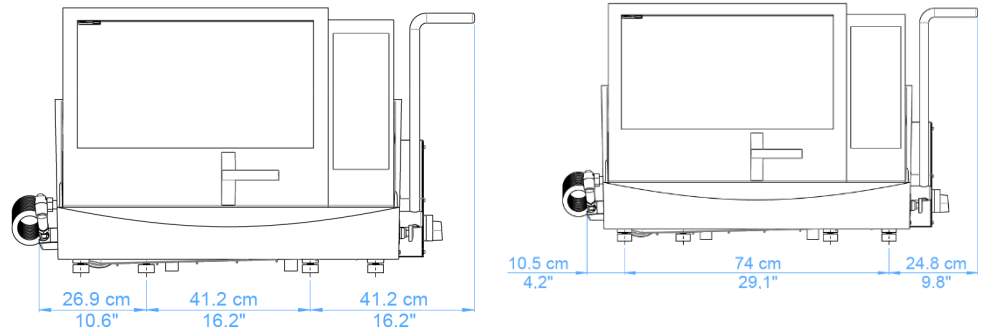
Lifting Points^[LL1]



Place lifting straps between front and hind legs as indicated.
Use a lifting bar to keep the lifting straps from pressing against the housing.

Labotom-15, Pre-Installation Checklist

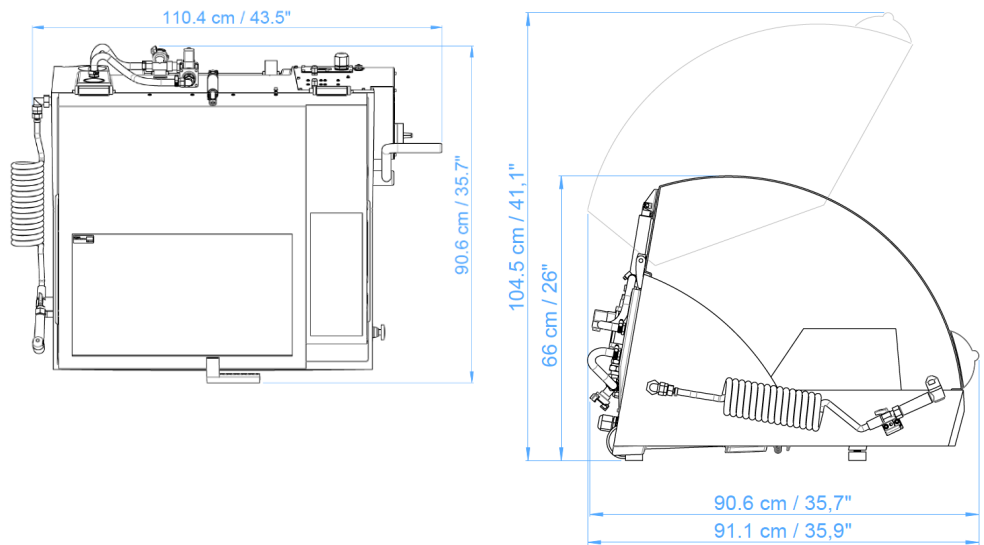
Footprint (feet) Front and back



Front.

Back.

Top and side



Top.

Side.

Recommended Space

Front:

Recommended space at the front: 100 cm / 40".

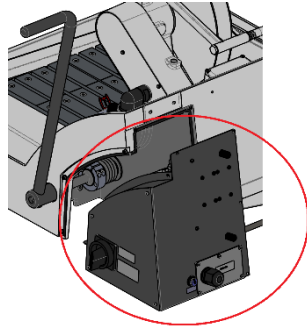
Rear:

- Check there is enough room behind the table for the inlet and outlet hoses. (No extra space is required when using Struers table as the table top has pre-cut holes for the hoses).
- For connection to an external exhaust system: Check there is approx. 15 cm / 6" behind the machine for the exhaust hose.

Power Supply

Mains cable

The machine is delivered without a mains cable.
A 4-lead or 5-lead cable is required.
The cable is connected to the electric connection box at the rear of the machine.



Electrical box

Recommended Mains Cable specification:

Voltage / frequency:	Min. Fuse size	Minimum cable size @ Min. fuse	Max. Fuse size	Minimum cable size @ Max. fuse
3x200V-50	30 A	3x 2,5 mm ² + PE	50 A	3x 4 mm ² + PE
3x200-210V-60	30 A	3x AWG14 + PE	50 A	3x AWG10 + PE
3x220-230V-50	30 A	3x 2,5 mm ² + PE	50 A	3x 4 mm ² + PE
3x220-240V-60	30 A	3x AWG14 + PE	50 A	3x AWG10 + PE
3x380-415V-50	20 A	3x 2,5 mm ² + PE	40 A	3x 2,5 mm ² + PE
3x460-480V-60	20 A	3x AWG12 + PE	40 A	3x AWG12 + PE

The other end of the cable can be fitted with an approved plug or hard-wired into the mains, according to the electrical specifications and local regulations.

Electrical Data

Voltage/frequency	Max. Load
3x200V-50Hz	47 A
3x200-210V-60Hz	44 A
3x220-230V-50Hz	42 A
3x220-240V-60Hz	39 A
3x380-415V-50Hz	24 A
3x460-480V-60Hz	24 A

External Short Circuit Protection

Labotom-15 must be protected with external fuses. Please see the Recommended Mains Cable specification for details on the fuse size required.

Residual Current Circuit Breaker

Type A, 30 mA (or better) is recommended.

Safety Specifications

Stop Mechanisms

	Designed to comply with a minimum of
Cover	EN60204-1, Stop Category 0 EN ISO 13849-1, Performance Level d
Emergency stop	EN60204-1, Stop Category 0 EN ISO 13849-1, Performance Level c

Water Supply

Required

Option

A Recirculation Cooling Unit is required.
Water Pressure: 1 - 5 bar / 14.5 - 73 psi

See Accessories on page 7 for details.

Water outlet – Drain

Required

Option

The machine is supplied with a 2 m / 6.5' drain hose, which redirects the cooling water into the recirculation cooling unit.

Compressed air

Required

Option

Not required.

Exhaust

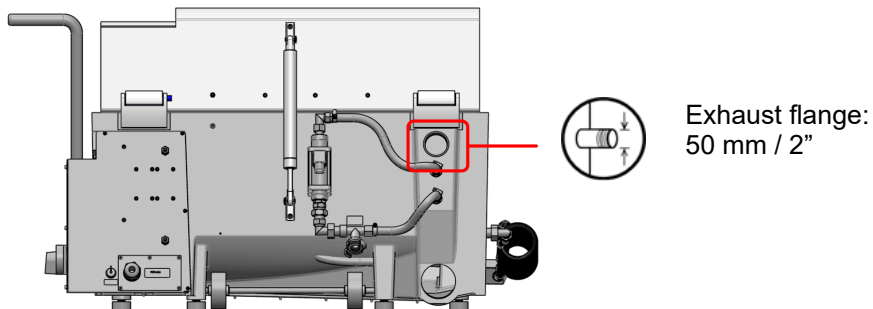
Required

Option

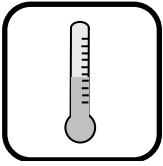
Recommended

Minimum capacity: 50m³/h / 1750ft³/h at 0mm / 0" water gauge.

Exhaust connection:



Ambient conditions



5 – 40 °C / 40 – 105 °F (operation)
0 – 60 °C / 32 – 140 °F (storage)



35 – 85% RH, non-condensing (operation)
0 – 90% RH, non-condensing (storage)

Accessories & Consumables

Please refer to the [Labotom-15 Brochure](#) and the [Struers Cut-off Wheels brochure](#) for details of the range available.

Recirculation cooling unit

Required

Struers Cooling System 4 with 100 l tank, large pump, Cooli-1 filter bag and adapter is recommended.

The Recirculation Cooling Unit is supplied with a 2.5 m / 8.2' water hose and a GEKA connection for easy assembly.

The Recirculation Cooling System is supplied with a 2.5 m / 8.2' power cable to connect to a **single phase** mains power supply.

Minimum requirements: Pump capacity 125 l/min / 33 g/min at 1 bar.

Required

Additive for recirculation cooling unit, to prevent corrosion and improve cutting results. *Struers Corrozip* is recommended.

The use of Struers consumables is recommended.

Other products (e.g. coolants) may contain aggressive solvents, which dissolve e.g. rubber seals. The warranty may not cover damaged machine parts (e.g. seals and tubes), where the damage can be directly related to the use of non-Struers consumables.

Contents of the Declaration of Conformity

Manufacturer
Struers ApS
Pederstrupvej 84
DK-2750 Ballerup, Denmark
Telephone +45 44 600 800

Herewith declares that

<i>Name:</i>	Labotom-15
<i>Function:</i>	Cut-off machine
<i>Type:</i>	06056229, 06056230, 06056235, 06056236, 06056246, 06056254

fulfils all the relevant provisions of the:

**Machinery Directive
2006/42/EC** according to the following standard(s):
EN ISO 12100:2010, EN ISO 13849-1:2015, EN ISO 13849-2:2012, EN ISO 13850:2015, EN
ISO 16089:2015, EN 60204-1:2006/A1:2009/corr.:2010.

and is in conformity with the:

**EMC Directive
2014/30/EU** according to the following standard(s):
EN 61000-3-2:2014, EN 61000-3-3:2013, EN 61000-6-2:2005/corr.:2005, EN 61000-6-
3:2007/A1:2011/A1-AC:2013.

**RoHS Directive
2011/65/EU** according to the following standard(s):
EN 50581:2012.

Supplementary Information The equipment complies with the following standards:
NFPA 79:2018, FCC 47 CFR part 15 subpart B.

The above has been declared according to the global approach, module A.

Authorized to compile the Technical File:

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