

TargetMaster

Instruction Manual

Original Instructions



CE

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1 About this manual

Instruction Manuals

Struers equipment must only be used in connection with and as described in the instruction manual supplied with the equipment.



Note

Read the instruction manual carefully before use.



Note

If you wish to view specific information in detail, see the online version of this manual.

2 Accessories and consumables

Accessories

For information about the available range, see the brochure for TargetMaster:

- [The Struers Website](http://www.struers.com) (<http://www.struers.com>)

Consumables

The equipment is designed to be used only with Struers consumables specifically designed for this purpose and this type of machine.

Other products 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 consumables not supplied by Struers.

For information about the available range, see:

- [The Struers Consumables Catalogue](http://www.struers.com/Library) (<http://www.struers.com/Library>)

3 Safety

3.1 Intended use - TargetMaster

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

TargetMaster is an automatic polishing machine for use in situations which require high-precision controlled removal of microscopic targets (micropolishing of thin layers).

The equipment is intended for use in quality control applications, where the surface can be prepared for further materialographic inspection. It is used for mechanical preparation of workpieces which have been embedded into a purpose-designed sample holder.

The equipment is designed for target preparation of materials, suitable for mechanical preparation.

The device is designed to be used with Struers consumables specially designed for this purpose and this type of device.

The machine must be operated only by skilled/trained personnel.

Do not use the machine for the following	<p>Preparation (grinding or polishing) of materials other than solid materials suitable for materialographic studies.</p> <p>The machine must not be used for any type of explosive and/or flammable material, or materials which are not stable during machining, heating or pressure.</p> <p>The machine must not be used with consumables and accessories which are not compatible with the equipment.</p>
Model	TargetMaster

3.2 Intended use - TargetDoser

Dosing system (05756904)

TargetDoser is a support system for programming and control of preparation methods and dosing of polishing suspensions and lubricants to TargetMaster. TargetDoser is prepared with space for liquid bottles, and it comes complete with pumps.

The equipment is designed to be used only with Struers consumables specifically designed for this purpose and this type of machine.

The machine must be operated only by skilled/trained personnel.

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

Do not use the machine for the following	The machine may not be used with consumables and accessories which are not compatible with the equipment.
Model	TargetDoser

3.2.1 TargetMaster safety precautions



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. All functions on the machine and any connected equipment must be in working order. Make sure that the actual electrical power supply voltage corresponds to the voltage stated on the type plate of the machine. The machine must be earthed (grounded).

3. The operator must read the safety precautions and Instruction Manual, as well as relevant sections of the manuals for any connected equipment and accessories. The operator must read the Instruction Manual and, where applicable, the Safety Data Sheets for the applied consumables.
4. The machine must be placed on a safe and stable table with an adequate working height. The table must be able to carry at least the weight of the machine and the accessories.
5. Always switch off the electrical power supply and remove the plug or power cable before dismantling the machine or installing additional components.
6. Connect the machine to a cold water tap. Make sure that the water connections are leak-proof and that the water outlet is working.
7. Struers recommends that the main water supply is shut off or disconnected if the machine is to be left unattended.
8. Make sure that your working space is well-ventilated.
9. Make sure that the grinding or polishing discs are correctly mounted.
10. Never look directly into the laser beam.
11. Never allow waste alcohol to accumulate in an open container or sink. Always observe your local environmental regulations regarding recycling alcohol. Use a closed container to collect waste alcohol.
12. If you observe malfunctions or hear unusual noises, stop the machine and call technical service.
13. In case of fire, alert bystanders and the fire brigade. Disconnect the electrical power supply. Use a powder fire extinguisher. Do not use water.
14. Struers equipment must only be used in connection with and as described in the instruction manual supplied with the equipment.
15. If the equipment is subjected to misuse, incorrect installation, alteration, neglect, accident or incorrect repair, Struers will accept no responsibility for damage to the user or the equipment.
16. Dismantling of any part of the equipment, during service or repair, should always be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).

TargetDoser - safety precautions

1. Ignoring this information and mishandling of the equipment can lead to severe bodily injuries and material damage.
2. The operator must read the safety precautions and Instruction Manual, as well as relevant sections of the manuals for any connected equipment and accessories. The operator must read the Instruction Manual and, where applicable, the Safety Data Sheets for the applied consumables.
3. The machine must be placed on a safe and stable table with an adequate working height. The machine must be installed in compliance with local safety regulations. All functions on the machine and any connected equipment must be in working order.
4. Alcohol-based consumables: follow the current safety rules for handling, mixing, filling, emptying and disposing of alcohol-based liquids.
5. If you observe malfunctions or hear unusual noises, stop the machine and call technical service.
6. In case of fire, alert bystanders and the fire brigade. Disconnect the electrical power supply. Use a powder fire extinguisher. Do not use water.

7. Struers equipment must only be used in connection with and as described in the instruction manual supplied with the equipment.
8. If the equipment is subjected to misuse, incorrect installation, alteration, neglect, accident or incorrect repair, Struers will accept no responsibility for damage to the user or the equipment.
9. Dismantling of any part of the equipment, during service or repair, should always be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).

3.3 Safety messages

Signs used in safety messages

Struers uses the following signs to indicate potential hazards.



ELECTRICAL HAZARD

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



DANGER

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



WARNING

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



CAUTION

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



CRUSHING HAZARD

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

General messages



Note

This sign indicates that there is a risk of damage to property, or a need to proceed with special care.



Hint

This sign indicates that additional information and hints are available.

3.4 Safety messages in this manual



CAUTION

Struers equipment must only be used in connection with and as described in the instruction manual supplied with the equipment.



ELECTRICAL HAZARD

The machine must be earthed (grounded).
Make sure that the actual electrical power supply voltage corresponds to the voltage stated on the type plate of the machine.
Incorrect voltage can damage the electrical circuit.



ELECTRICAL HAZARD

For electrical installations with Residual Current Circuit Breakers

For TargetMaster a residual current circuit breaker Type B, 30 mA is required (EN 50178/5.2.11.1).

For electrical installations without Residual Current Circuit Breakers

The equipment must be protected by an insulation transformer (double-wound transformer).
Contact a qualified electrician to verify the solution.
Always follow local regulations.



CAUTION

Specimen height must never exceed 24 mm. Exceeding this value can result in incorrect laser measurements and/or collision in TargetMaster.



CAUTION

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



CAUTION

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



WARNING

Do not use the machine with defective safety devices.
Contact Struers Service.



CAUTION

When working at machines with rotating parts, take care to prevent clothes and/or hair from being caught by the rotating parts.



CAUTION

Keep clear of rotating parts during operation.

**WARNING**

Before you release the emergency stop, investigate the reason for activating the emergency stop and take any necessary corrective action.

**CAUTION**

Do not use the machine with non-compatible accessories or consumables.

**CAUTION**

The grinding stone/diamond grinding disc has rough or sharp edges.
Use working gloves to protect fingers and hands.

**WARNING**

Do not use the machine with defective safety devices.
Contact Struers Service.

**WARNING**

Safety critical components must be replaced after a maximum lifetime of 20 years.
Contact Struers Service.

4 Getting started

4.1 Device description

TargetMaster is designed for controlled target removal and other types of high accuracy mechanical preparation applications, e.g. microelectronics, delayering and failure analysis where specific areas are to be inspected.

With the TargetSystem accessories, the device can be used for target preparation of visible or hidden target e.g. microcracks, inclusions and porosities, oxidation layers, and coatings.

The machine is designed for automatic preparation, cleaning and measuring. The machine is equipped with two separate optical laser measuring systems which control the polishing steps and movements. It automatically re-calculates the removal rate and polishing time.

The machine can perform cross-sectioning by grinding and parallel polishing of mounted and unmounted samples. TargetMaster has a closed polishing chamber for safe ventilation of dust and minimized contamination of the samples.

The individual components of TargetSystem can be combined in several ways, according to requirements. The accessories TargetZ and TargetX make it possible to accurately map and align targets.

The process starts by identifying a relevant workpiece and area that needs to be inspected. The operator places the workpiece in a sample holder. The operator places the sample holder in TargetMaster.

The operator makes sure that suitable consumables are selected before continuing the process.


The operator selects a suitable preparation method and time/accuracy factor. A target value is defined. The target value describes the distance to the target. On TargetMaster it can be measured and set with precision.

TargetMaster automatically adapts the removal time and rate according to the properties of the specimen and the grinding/polishing surface.

Before preparation starts, the sample height is measured and the removal time is calculated for each of the steps. The removal times are based on the selected preparation method and base values. The removal values for grinding and polishing surfaces are stored in TargetMaster.

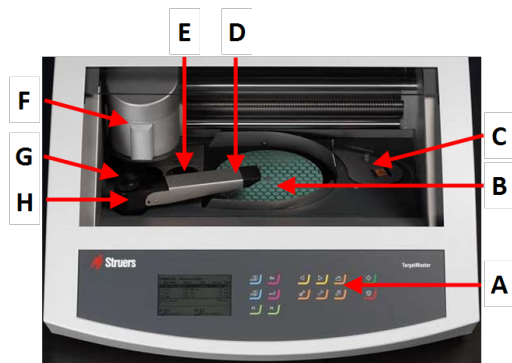
The operator start the preparation process using the base values. After gaining experience with the properties of the sample and surface, preparation stops and the actual amount of removed material is determined. On this basis, the actual removal rate for the first part of the step is calculated. The new removal rate is used for the remaining part of the step. This process continues until the selected preparation method is completed.

When the preparation process is completed, the operator removes the sample holder.

Note

NOTE: The machine is developed to be used only with suitable consumables and accessories (e.g. polishing discs) designed for this purpose and this type of machine. The equipment is designed to be used only with Struers consumables specifically designed for this purpose and this type of machine.

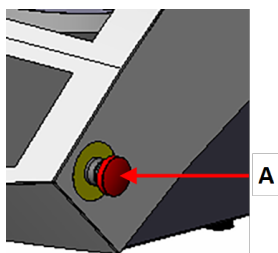
See brochure and the Struers consumables catalog for more details about suitable consumables.

4.2 Front view - TargetMaster




- A** Control panel
- B** Turntable with MD-Disc
- C** Laser measuring station
- D** Multi-nozzle dosing head
- E** Station for:
 - Rinsing with soap and water
 - Drying with compressed air
- F** Sample mover
- G** Station for:
 - Rinsing with alcohol
 - Drying with compressed air
- H** Tap for controlling water flow


4.3 Side view - TargetMaster



- A** Emergency stop



Emergency stop



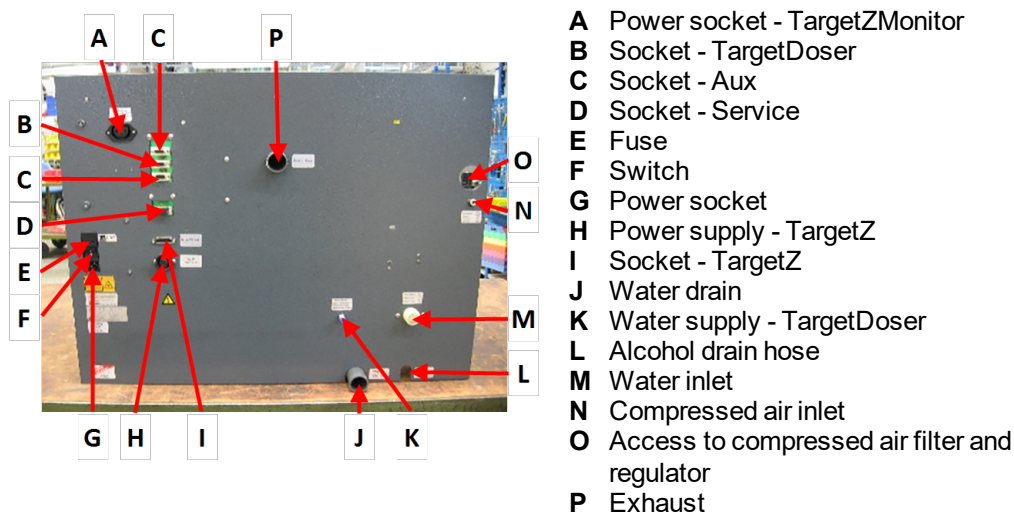
Note

Do not use the emergency stop for operational stop of the machine during normal operation.

Before you release the emergency stop, investigate the reason for activating the emergency stop and take any necessary corrective action.

- To activate the emergency stop, press the red emergency stop button.
- To release the emergency stop, turn the red emergency stop button clockwise.

4.4 Rear view - TargetMaster




5 Transport and storage

If, at any time after the installation, you have to move the unit or place it in storage, there is a number of guidelines we recommend that you follow.

- Package the unit securely before transportation.
Insufficient packaging could cause damage to the unit and will void the warranty. Contact Struers Service.
- Struers recommends that all original packaging and fittings are kept for future use.

5.1 Long-term storage or shipping



Note

Struers recommends that all original packaging and fittings are kept for future use.

- Remove any other accessories.
- Clean and dry the unit before storage.
- Disconnect the unit from the electrical power supply.
- Place the machine and accessories in their original packaging.

6 Installation



WARNING

Struers equipment must only be used in connection with and as described in the instruction manual supplied with the equipment.

6.1 Unpacking



Note

Struers recommends that all original packaging and fittings are kept for future use.

- Detach the machine from the packing crate by removing the four bolts on the bottom of the crate.

6.2 Checking the packing list



Note

Handle the equipment with care, as any damage can affect the precision of the equipment.

Optional accessories may be included in the packing box.

The packing box contains the following items:

Pcs.	Description
1	TargetMaster
1	MD-Disc (Magnetic turntable. Diameter: 200 mm)
2	Power supply cables
1	Inlet hose. Diameter: 3/4". Length: 2 m.
1	Filter gasket. Diameter: 3/4".
1	Gasket. Diameter: 1 1/4". Length: 1.5 mm.
1	Reduction ring with gasket. Internal diameter: 1/2". External diameter: 3/4".
1	Drain hose. Diameter: 3/2". Length: 2 m.
1	87°-bend outlet pipe. Diameter: 3/2"

Pcs.	Description
1	Flange
2	Hose clamp
1	TargetGrip
1	Hose for compressed air. Internal diameter: 4 mm. External diameter: 6 mm.
1	Compressed-air connector
50	Metal label for sample chair
50	Sample chair
1	Screwdriver, Allen key head, 3 mm
1	Air exhaust hose- Diameter: 50". Length: 2 m.
1	Bottle of cyanoacrylate (super glue)
1	Stand for TargetGrip/sample chair
1	Instruction Manual set

6.3 Lifting



CRUSHING HAZARD

Take care of your fingers when handling the machine.
Wear safety shoes when handling heavy machinery.



Note

Do not lift the machine by the light gray top part or by the water tap.
Always lift the machine from beneath.

Weight	
TargetMaster	115 kg (235.5 lbs)
TargetDoser	19 kg (41.9 lbs)
TargetX - (option)	21.5 kg (47.4 lbs)
TargetZ - (option)	15 kg (33 lbs)
TargetZ Monitor - (option)	8 kg (17.6 lbs)



Note

The straps must be approved for at least twice the weight of the machine.
The straps must be long enough so that they do not place stress on the cover of the machine.

You need a crane and two lifting straps to lift the machine off the shipment pallet.

Before lifting the machine into its final position, do as follows:

1. Remove the screws on the base of the packaging create and remove the top part of the crate.
2. Remove the metal brackets securing the machine to the pallet using a 4 mm Allen key.

3. Place the two straps under the machine.
4. Place the straps outside the feet on the machine.
5. Struers recommends the use of a lifting bar to keep the straps apart below the lifting point.
6. Lift the machine onto the table.

6.4 Location

Operating environment

System accuracy is dependent on an environment with a stable temperature.

- Ambient conditions
See [Technical data - TargetMaster ▶ 81](#), Operating environment.



Note

Do not place TargetMaster beside a window or close to other sources of heat or cooling such as radiators or ventilation ducts.

Location



CRUSHING HAZARD

Take care of your fingers when handling the machine.
Wear safety shoes when handling heavy machinery.

- To facilitate easy access for service technicians, allow sufficient space around the machine.
- Place the machine on a rigid, stable workbench with a horizontal surface and an adequate height.

TargetDoser

- Make sure that there is enough space, to position TargetDoser to the left of TargetMaster.

6.5 Power supply



ELECTRICAL HAZARD

Switch off the electrical power supply before installing electrical equipment.
The machine must be earthed (grounded).
Make sure that the actual electrical power supply voltage corresponds to the voltage stated on the type plate of the machine.
Incorrect voltage can damage the electrical circuit.



Note

An autotransformer is required in countries with a 110 V electrical power supply.

Power socket

The electrical power supply socket must be easy to access. The electrical power supply socket must be located at a height ranging from 0.6 m to 1.9 m (2½' to 6') above floor level. Not higher than 1.7 m (5'

6") is recommended.



Note

The equipment is shipped with 2 types of electrical power cables. If the plug supplied on these cables is not approved in your country, the plug must be replaced with an approved plug.

6.5.1 Single-phase supply

Single-phase supply

The 2-pin plug (European Schuko) is for use on single-phase electrical power connections.

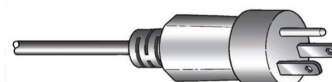


The leads must be connected as follows:

Yellow/Green	Earth (ground)
Brown	Line (live)
Blue	Neutral

6.5.2 2-phase supply

The 3-pin plug (North American NEMA) is for use on 2-phase electrical power connections.



The leads must be connected as follows:

Green	Earth (ground)
Black	Line (live)
White	Line (live)

6.5.3 Connection to the machine



WARNING

The output voltage from this cable is 220-240 V. Do not use this cable to connect equipment that uses a 110 V power supply. Failure to do so can result in material damage.

- Connect the electrical power cable to the machine (C14 IEC 320 connector).
- Connect the cable to the electrical power supply.



Note
Switch on TargetMaster at least 45 minutes before use.

Struers recommends that the machine is switched on always so that the internal temperature of the machine is kept at a constant level, as this is vital for system accuracy.

6.6 Compressed air supply

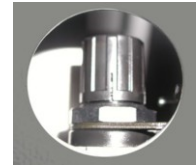
For specifications, see [Technical data - TargetMaster](#) ► 81

1. Connect the compressed air hose to the quick coupling supplied with the machine.
2. Secure the connection with the hose clamp supplied with the machine.
3. Connect the quick coupling to the compressed air inlet on the machine.

Air pressure regulator

Note
The air pressure regulator is pre-set at the factory and should not be adjusted by the user.

The air pressure regulator is visible through the access hole above the compressed air inlet at the rear of the machine.

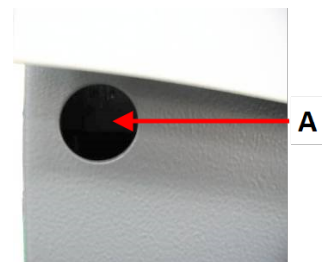


6.6.1 Air filter

TargetMaster is fitted with an air filter that removes very small amounts of water and oil from the compressed air supply.

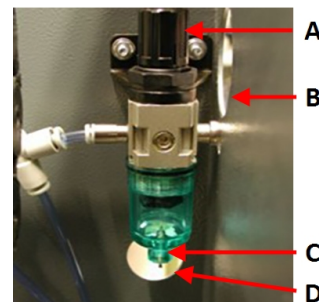
The part of the filter that can be accessed by the user is the tip of the air filter drain valve. It can be seen through the access hole on the left side of the machine.

- A** Hole in the side panel for access to the air filter drain valve, seen from the outside



The filter is mounted inside the machine.

- A** Air pressure regulator
- B** Hole in the rear panel for access to the air pressure regulator
- C** Tip of air filter drain valve
- D** Hole in the side panel for access to the air filter drain, seen from inside

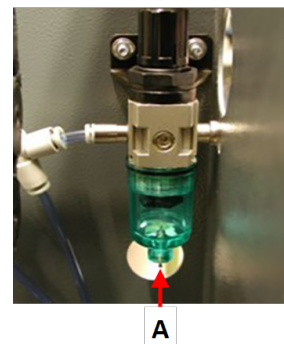


Emptying the air filter

Drain the filter regularly.

If you hear a spluttering sound during the process of drying with compressed air, or if drying is ineffective, this means that the filter must be drained.

1. Through the hole in the side panel, press the tip of the air filter drain valve and keep pressing it until no more liquid comes out of the filter.



A Tip of air filter drain valve

6.7 Water supply and water outlet

6.7.1 Connecting to the water supply

Water for wet grinding can be supplied from the main water supply, or from an internal distilled water supply.



Note

The cold water supply must have a head pressure in the range 1 - 9.9 bar (14.5 - 143 psi).



Hint

New water pipe installations:
Leave the water to run for a few minutes to flush any debris from the pipe before connecting the machine to the water supply.

Connecting the water inlet hose

1. Connect the straight end of the pressure hose to the water inlet tube on the back of the machine:
 - Insert the filter gasket in the coupling nut with the flat side against the pressure hose.

- Tighten the coupling nut.
- 2. Connect the other end of the pressure hose to the main water outlet
 - Mount the reduction ring with gasket on the cold water outlet if necessary.
 - Tighten the coupling nut.

6.7.2 Connecting to the waste water outlet

1. At one end of the drain hose a short length of the steel reinforcement has been stripped away. Connect the stripped end of the hose to the water outlet tube and secure it with a hose clamp.

If there is only limited space behind the machine, use the 87°-pipe bend and attach it directly to the outlet tube on the back of the machine. Then attach the drain hose to the other end of this bend.
2. Lead the other end of the waste water hose to the waste water drain. If needed, shorten the hose.



Note

Make sure that the hose slopes downward towards the waste water drain throughout its entire length.
Make sure that there are no sharp bends in the waste water hose.

6.7.3 Connecting the alcohol drain hose

Waste alcohol from cleaning steps is disposed of through the alcohol drain hose, which must be led to an alcohol storage container or to a disposal drain.

Local environmental regulations may require that waste alcohol is recycled.

- If this is the case, lead the alcohol drain hose to a sealed container.
- If not, lead the drain hose to a waste drain.



Note

Never reuse the alcohol for sample preparation with TargetMaster.

6.8 Connecting to an exhaust system

You must connect an exhaust system to TargetMaster.

1. Connect a hose from your exhaust system to the outlet at the rear of the machine.
2. Use a hose clamp to secure the connection.

6.9 Installing the MD-Disc

The turntable of the machine is by default fitted with an MD-Disc. The magnetic surface on the MD-Disc ensures that abrasive discs with a metallic backing attach to the turntable without the use of additional fixtures.



1. Place the MD-Disc on the turntable and rotate it until the pins on the underside of the MD-Disc match the corresponding holes in the turntable.



2. Make sure that the MD-Disc is firmly secured to the turntable.

6.9.1 Abrasive discs

Placing an abrasive disc on the MD-Disc

1. Make sure that the magnetic surface is clean and dry.
2. Place the MD-Disc on the turntable and rotate it until the pins on the underside of the MD-Disc match the corresponding holes in the turntable. Make sure that the abrasive disc is centered on the turntable.
3. Lower the disc into position until it is securely fixed by the magnet.

Removing an abrasive disc from the MD-Disc

1. Remove the disc from the magnetic surface by lifting it at the edges.

Checking the water flow

When you have placed the abrasive disc on the turntable, you must check the water supply.

1. Make sure that a grinding or polishing disc is correctly placed on the turntable.
2. Open the water tap on the TargetMaster rinsing station and make sure that the flow is sufficient.
3. Adjust the flow rate by increasing the flow until splashing just occurs.
4. Reduce the flow slightly.

6.9.2 Diamond pad discs

Dressing



Note

- Never use dressing sticks on diamond pad discs.

The diamond surface of diamond pad discs must be dressed frequently to expose the diamond surface. If the diamond surface is not dressed, the surface glazes over and starts to tear the material instead of grinding it.

- Use a stiff brush, soap and water.

Cleaning

Use a stiff brush, soap and water to clean diamond pad discs

Clean the surface of the diamond pad disc after each use to prevent debris from accumulating on the surface of the disc.

6.10 TargetDoser

TargetDoser supplies the grinding/polishing suspensions and lubricants as well as pre-defined grinding/polishing procedures.



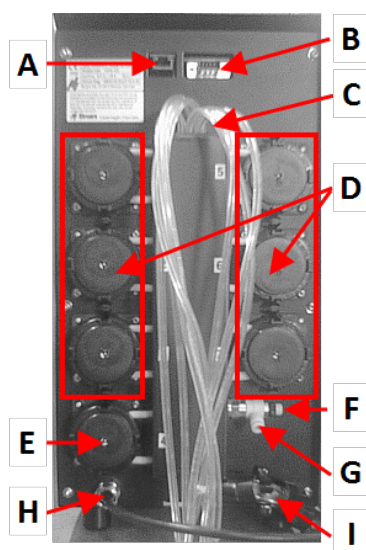
6.10.1 Checking the packing list

1. Unpack TargetDoser.

The packing box contains the following items:

Pcs.	Description
1	TargetDoser
1	Dosing bottle box with built-in pumps, 3 large bottles and 4 small bottles
1	Bottle of soap solution (1 l)

6.10.2 TargetDoser- Rear view



- A Network connection (RJ45)
- B Service connector (serial port connector)
- C Supply tubes from lubricant/suspension bottles
- D Pumps (1-6)
- E OP-suspension pump
- F Regulation valve for water pressure
- G Water connection from TargetMaster for OP-pump
- H Power and interface connection from TargetMaster
- I Tubes for TargetMaster multi-dosing head

6.10.3 Installation - TargetDoser

1. Place TargetDoser as close as possible to the left of TargetMaster.



Note

The tubes connecting TargetDoser to TargetMaster are pre-mounted on TargetDoser.

2. Make sure that TargetDoser does not interfere with the operating functions of TargetMaster.

6.10.4 Connecting TargetDoser

The electrical connection from TargetMaster supplies the TargetDoser with a 24 V power supply to TargetDoser and a data bus, which enables the two machines to communicate.



CAUTION

Switch off the electrical power supply before installing electrical equipment.

1. Switch off TargetMaster.
2. Connect the cable from the rear of TargetDoser to the TargetDoser connector on the rear of TargetMaster.

For more information on how to connect TargetDoser to TargetMaster, see the Instruction Manual for TargetMaster.

6.10.5 Pump connections

TargetDoser is supplied fitted with 7 pumps:

Pump 1, 2, 3 and 4

Diamond suspension/Lubricant

Pump 5

Alcohol

Pump 6
Pump 7

Soap
OP suspension

Note
The allocation of the pumps is very specific and must not be changed.

The dimensions of pumps 5, 6 and 7 are different from the other pumps, as they are designed for specific purposes.

Note
The distance between TargetDoser and TargetMaster is determined by the length of the tubes. Do not increase the length of the tubes, as this has already been optimized from the factory.

Connecting the tubes

Each tube is numbered according to the pump to which it is to be connected.

1. Connect the tubes from each pump to the corresponding connector on the side of TargetMaster.
2. Do so until all tubes are connected.



6.10.6 Water supply for OP flushing

1. Connect the water tube supplied to the quick coupling on the rear of the TargetMaster.
2. Connect the other end of the water tube to the quick coupling on the rear of the TargetDoser.

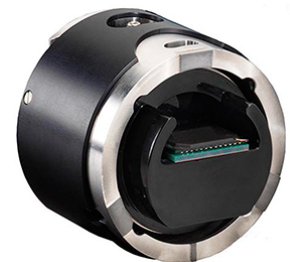
Note
Do not push the water tube all the way into the quick coupling as this can squeeze the tube and result in reduced water flow.

6.11 TargetGrip

TargetGrip is a tiltable specimen holder for use with TargetMaster.

You can move samples around between TargetMaster, TargetZ, TargetX, and a microscope, without losing precision.

TargetGrip accommodates mounted samples up to 40 mm in diameter and can be fitted with adapters for larger specimens.



6.11.1 Checking the packing list

1. Unpack TargetGrip.

The packing box contains the following items:

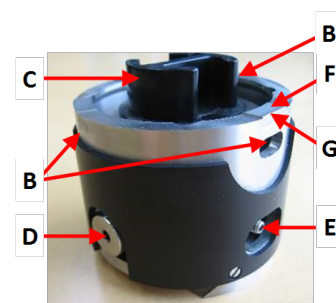
Pcs.	Description
1	TargetGrip
1	Allen screwdriver, 2 mm

6.11.2 Overview - TargetGrip

- A** Dovetail connection with orientation notch



- B** Locking screws for mounts/adapters
C Sample chair
D Tilt adjustment screws
E Tilt locking screws
F Reference plane
G Reference edge



- H** Tilt scale (each step = 2°)
I Alignment plane



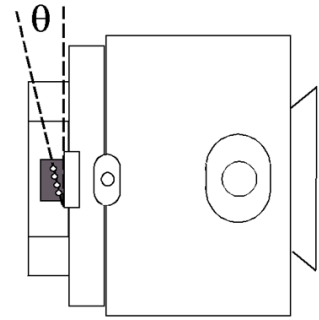
6.11.3 Tilt mechanism

You can use the tilt mechanism to adjust the sample chair or sample holder so that the samples are being ground with the grinding surface parallel to the target area that is going to be inspected.

The tilt mechanism is normally used when TargetGrip is mounted in TargetZ or TargetX. This means that you can align the target area with the crosshairs shown on the screen.

Adjusting the tilt

Max. tilt θ to target plane: ± 5



1. Loosen the tilt locking screw.
2. Turn the tilt adjustment screw to change the angle of tilt for the sample. The target area must be parallel to the lines shown on the screen. On TargetX you can adjust the tilt by using the buttons on the control panel.
3. Tighten the tilt locking screw to secure the alignment.



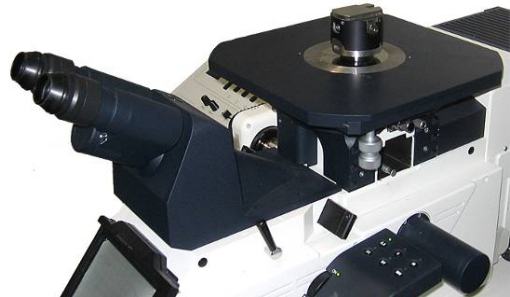
Note

If you do not tighten the tilt locking screw sufficiently, this can lead to incorrect alignment, and failure to reach the intended target plane.

6.11.4 Dovetail connector

The dovetail connector lets you move TargetGrip from TargetMaster during the grinding or polishing process for viewing or inspection.

Struers recommends that you use an inverted microscope with TargetSystem, so that the sample chair can remain clamped in TargetGrip. This means that you can continue the process without losing precision or having to re-align.



1. Loosen the tilt locking screw.
2. Turn the tilt adjustment screw to change the angle of tilt for the sample. The target area must be parallel to the lines shown on the screen. On TargetX you can adjust the tilt by using the buttons on the control panel.
3. Tighten the tilt locking screw to secure the alignment.



Note

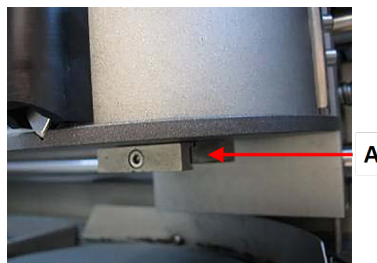
If you do not tighten the tilt locking screw sufficiently, this can lead to incorrect alignment, and failure to reach the intended target plane.

6.11.5 Mounting TargetGrip

1. Place the sample in TargetGrip before mounting TargetGrip on the machine.



A Dovetail connector



A Groove

2. Slide the dovetail into the groove in the sample mover.
3. Use the 3 mm Allen screwdriver supplied with the machine to secure TargetGrip.



6.11.6 Holders and adapters

Always use TargetSystem holders and adapters, which are specifically designed for cross-sectioning and parallel polishing.

The holders and adapters have a neutral black surface which serves as background for the laser measuring system. The laser measuring system keeps track of material removal by measuring on the holder or adapter and not the sample.

For some applications you may need to clamp a 30 mm or 40 mm mount into TargetGrip. In this case, laser measuring is done directly on the sample surface.

The following holders and adapters can be used with TargetGrip:

- Sample chair. Diameter: 40 mm
- Sample chair. Diameter: 30 mm
- Parallel holder. Diameter: 40 mm
- Parallel holder. Diameter: 30 mm
- Mold insert. Diameter: 40 mm

- SEM adapter. Diameter: 40 mm to 25 mm

6.11.7 Mounting holders/adapters

1. Place the holder/adapter in TargetGrip.
2. Rotate the holder/adapter so that the sample faces the reference area. See [TargetGrip ▶ 26](#).
3. Rotate the sample holder/adapter so that pins on the back of the holder/adapter engage with the corresponding guide holes in TargetGrip.



4. Use the 2 mm Allen key to secure the holder/adapter in TargetGrip.
5. Mount TargetGrip in the setup station using the dovetail connector. If needed, see the TargetZ and TargetX instruction manuals for instructions on how to align the sample and define the target value.
6. Remove TargetGrip from the setup station.
7. Clean the reference surface with alcohol so that it is clean and free from grease or mounting residue. Alternatively, use the initial cleaning program on TargetMaster.
8. You can now mount TargetGrip in the TargetMaster sample mover.

6.12 Noise

For information on the sound pressure level value, see this section: [Noise and vibration levels ▶ 84](#)
[Noise and vibration levels ▶ 84](#)



CAUTION

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

Handling noise during operation

Different materials have different noise characteristics.

- Semi-automatic preparation** To lower the noise, decrease the rotational speed and/or the force with which the specimens are pressed against the preparation surface. The processing time may increase.

6.13 Vibration

For information on the total vibration exposure to hand and arm, see this section: - [TargetX ▶ 1](#)



CAUTION

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

Handling vibration during operation

Manual preparation may cause vibrations in hand and arm. To lower the vibration, decrease the pressure or use a vibration-reducing glove.

7 Preparing the device

7.1 Starting the machine the first time

- Switch on the machine on the main switch on the back of the machine.

Start-up - the first time

The first time the machine is switched on, the **MAIN MENU** screen is shown.

For instructions on how to navigate in the display, see:

- [Control panel functions - TargetMaster ▶ 32](#)
- [The display ▶ 33](#)

Language

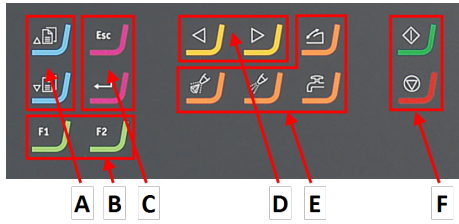
Select the language you wish to use. If needed, you can change the language at a later date.

1. From the **MAIN MENU** screen, select **CONFIG. > Language**.
2. Scroll up or down in the list to select the language of your choice.

Start-up - daily operation




When you switch on the machine, the screen that was shown when the machine was switched off is shown just after the start-up screen.

7.2 Control panel functions - TargetMaster



- A Scroll up/Scroll down**
- B Function keys - F1, F2**
- C Escape, Enter**
- D Moving the sample holder**
- E Function buttons**
- F Start, Stop**

Button	Function
	Scroll up <ul style="list-style-type: none"> Press this button to scroll up in a screen and to increase the value of a setting.
	Scroll down <ul style="list-style-type: none"> Press this button to scroll down in a screen and to decrease the value of a setting.
 and 	Function key <ul style="list-style-type: none"> Press this button to activate controls for various purposes. See the bottom line of the individual screens.
	Escape <p>Use this button on the control panel to return to previous functions or values.</p> <ul style="list-style-type: none"> Press the button to return to the main menu. Press the button to return to the last function or value. Press the button to cancel changes.
	Select/Enter <ul style="list-style-type: none"> Press this button to enter a field, for instance a setting, to select a value, and to confirm a selection.
	Move to the left <ul style="list-style-type: none"> Press this button to move the sample holder to the left.
	Move to the right <ul style="list-style-type: none"> Press this button to move the sample holder to the right.
	Abrasive <ul style="list-style-type: none"> For manual dosing of abrasive.
	Lubricant <ul style="list-style-type: none"> For manual dosing of lubricant.
	Safety guard <ul style="list-style-type: none"> Opens and closes the safety guard door when the machine is not operating.

Button	Function
	Water <ul style="list-style-type: none"> Activates the water flow.
	Start <ul style="list-style-type: none"> Starts the preparation process.
	Stop <ul style="list-style-type: none"> Stops the preparation process.

7.3 The display



Note

The screens shown in this manual may differ from the actual screens in the software.

When you switch on the machine, the display shows the configuration and the version of the installed software.

After start-up, the display changes to the screen last shown when the machine was switched off.

The display is divided into some main areas. See this example.

A Title bar

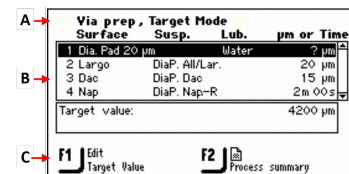
The title bar shows the function you have selected.

B Information fields

These fields show information about the selected function. In some fields you can select and change the value.

C Function key options

The functions shown depend on the screen that is displayed.



Via prep. Target Mode					
Surface	Susp.	Lub.	µm or Time		
1 Dia. Pad	20 µm	Water	?	µm	
2 Largo		DiaP. All/Lar.	20	µm	
3 Dac		DiaP. Dac	15	µm	
4 Nap		DiaP. Nap-R	2m 00s		
Target value:			4200	µm	

F1 Edit Target Value **F2** Process summary

The display shows information such as menus, preparation settings, or the preparation process as it progresses.

Navigating in the display

Use the buttons on the control panel to navigate in the display.

See also [Control panel functions - TargetMaster](#) ► 32.

Sound

Short beep

A short beep, when you press a key, indicates that the selection is confirmed.

You can enable or disable the beep: select **Configuration**.

Long beep

A long beep, when you press a button, indicates that the key cannot be activated at the moment.

You cannot disable this beep.

Standby mode

To increase the lifetime of the display, the back-light is dimmed automatically if the machine has not been used for a while. (30 min)

- Press any key to re-activate the display.

7.3.1 Main menu - TargetMaster

From the **Main menu** screen you can choose between the following options:



- **Process**



- **Manual Functions**



- **Configuration**

7.4 Configuration - TargetMaster

Before you start using TargetMaster, you must configure the following:

- Cleaning programs
- Options
- Calibration of the measuring system.

You can access these settings from the **Configuration** screen.

1. From the **Main menu** screen, select the **Configuration** screen.
2. From the **Configuration** screen, select:

Menu item	Description
Cleaning program configuration	<ul style="list-style-type: none"> • Use this menu item to configure cleaning programs. See Configuring cleaning programs ▶ 35.
Options	<ul style="list-style-type: none"> • Use this menu item to change settings such as Language and Display brightness See The Options screen ▶ 38.

Menu item	Description
Configuration of initial removal rates	<ul style="list-style-type: none"> Use this menu item to change or select initial removal rates. See Initial removal rates ▶ 37
Calibration of TargetZ	<ul style="list-style-type: none"> Use this menu item to access the TargetZ Calibration screen. See Calibrating TargetZ ▶ 1 .

7.4.1 Configuring cleaning programs

In the **Cleaning program configuration** screen you must define the cleaning agents to be used and the duration of the individual cleaning steps.

- From the **Main menu** screen, select **Configuration > Cleaning program configuration**.



- Toggle between the available cleaning programs:

- **Initial cleaning**

This program is for specimens which require cleaning before initial measuring.

To view and select this menu item, you must enable it in the **Options** screen.

- **Cleaning after grinding**

- **Cleaning after polishing**

- **Final cleaning**

This program is for additional final cleaning without alcohol, which may leave stains.

To view and select this menu item, you must enable it in the **Options** screen.



- Select the **Cleaning media** field.



Note

Steps 4 and 5 are for cleaning the second chamber.
Always clean both chambers after each step.

- Select the desired cleaning medium.

- Close the list.

- Select the **Time** field.

- Press **Enter**.




8. Set the time.
The time range is from 0 to 120 seconds.
9. Select the time setting and close the dialog.
10. Continue until you have defined all required steps.
11. Return to the **MAIN MENU** screen.
12. If you need to reset all parameters to the default settings, press **F2**.



7.4.2 The Cleaning after grinding program

In many cases, you can shorten the **Cleaning after grinding** program. If you use SiC Paper, you can avoid using soap and cut the remaining cleaning steps by half.



Note
If you have polished the specimen, always use the default **Cleaning after polishing** program to clean the specimen with soap. Do not use a shortened cleaning program.

Testing the new cleaning program

1. In the **Configuration** screen, change the **Cleaning after grinding** settings to the following:

Step	Cleaning media	Time
1	Soap	0 s
2	Water	5 s
3	Air	5 s
4	Alcohol	5 s
5	Air	15 s

On TargetDoser:

2. Create a **Removal mode** method with a single step with SiC #800, and removal of 500 µm or more, depending on the specimen.
3. Transfer the method from TargetDoser to TargetMaster.

On TargetMaster:

1. Select **Manual measuring** and measure the specimen height.
2. Enter the value.
3. Go to the **Process** screen and press **Start**.
4. Compare the results. If the deviation is greater than +/- 5 µm, repeat the process to remove 500 µm more, and stop the process after cleaning.
5. Remove TargetGrip.

6. Make sure that the reference plane and sample surface are totally dry. If there is some moisture left, increase the air time as needed.
7. If this does not work, use the default values for this cleaning program.

7.4.3 Sample contraction during cleaning

A temperature change offset value has been defined in the TargetMaster software to compensate for any contraction in the materials that can result from cooling after cleaning.

The offset value has been set to a default value of 1 μm for each cleaning cycle. This adds up to a total of 4 μm for the standard methods provided with TargetMaster. If you use fewer cleaning cycles, TargetMaster automatically reduces the total contraction value.

If you observe consistent measurement errors, you can redefine the offset value.

To change the values, see [The Options screen](#) ► 38.

7.4.4 Initial removal rates

In TargetMaster, the Initial removal rate values are used as follows:

- for the first part of any polishing step
- for the first part of any grinding step that starts at closer than 250 μm to the grinding/polishing transition
- in other cases where grinding reaches 175 μm from the grinding/polishing transition.

The Initial removal rate database can accommodate up to 20 Initial removal rate values which can be allocated to any consumable in TargetDoser.

The laser measurement system uses the Initial removal rates, because the laser cannot continuously measure the removal. The laser measurement system measures the removal at discrete time intervals. When the first part of the step is completed, a measurement is made to register how much material was removed, and the actual removal rate is calculated.

You can use initial removal rates to optimize preparation. The initial removal rate must never be lower than the actual removal rate shown in the **Process summary** screen at the end of a full preparation.



Note

The initial removal rate must always be higher than the actual removal rate. If # 800 SiC paper, which is the default surface for plane grinding, is replaced by for example, Diamond Pad, remember to adjust Initial removal rate downwards, e.g. from 2300 μm to 900 $\mu\text{m}/\text{minute}$. Do not change the surface in the middle of a step. If a SiC paper tears, replace it with a new, finer grit paper and continue the step.


Adding or editing an Initial removal rate value

See [Setting Initial removal rate values](#) ► 51

Adding a new surface

1. In the **Configuration of initial removal rates** screen, press **F1** if you wish to add a new surface.





Note
If the Initial removal rate database is full, you must delete a surface before adding a new one.

7.4.5 The Options screen

From the **Options** screen you can set up general options for e.g. display, language, final cleaning, etc.

- If needed, you can reset some settings to their factory default value:
Press function key **F1** when the value is highlighted.



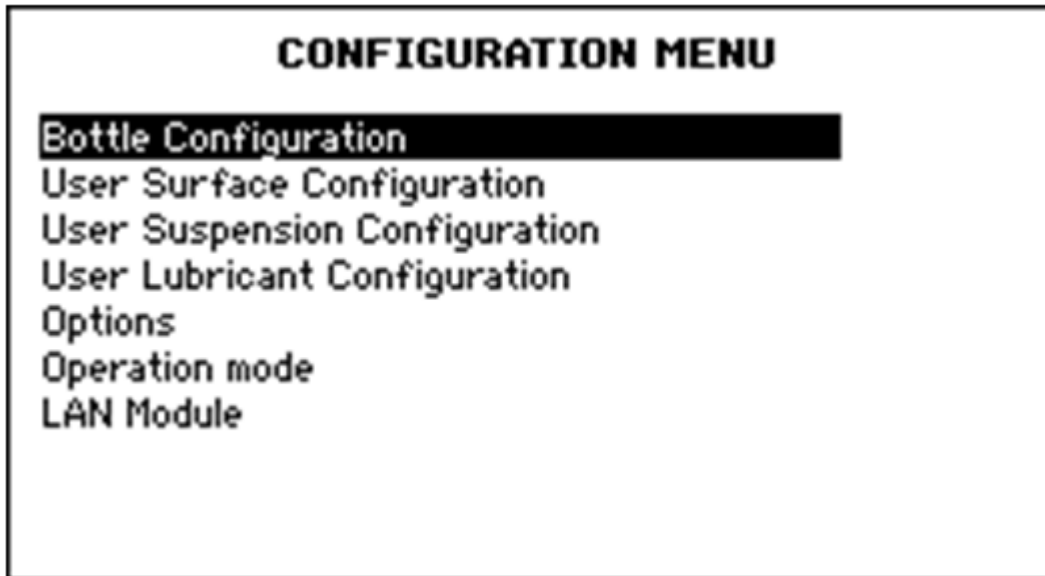
1. From the **Configuration** screen, select the **Options** screen.

Option	Setting
Display contrast	You can adjust the display to make it easier to view.
Units	Show the removal rate settings in one of the following units: <ul style="list-style-type: none"> • Newton - μm (Metric) • Lbf - mils (Imperial)
OP flushing time	0 - 120 seconds
Language	Select the language you wish to use in the software.
Sample contraction during cleaning	0 – 99 μm
Initial cleaning	Include in Cleaning program configuration screen? Yes/No
Final cleaning	Include in Cleaning program configuration screen? Yes/No
Time/Accuracy factor	

2. Select the setting you wish to change.
3. Press **Enter** to access the setting.
4. Change the value of the setting.
5. Enter the new setting and return to the **Options** screen.
6. Return to the **Main menu** screen.



7.5 Configuring TargetDoser



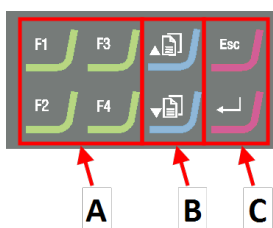
You must configure the following settings before you start using the machine:

- See [Bottle configuration](#) ▶40







To define other settings, see:

- [Configuring a user surface](#) ▶41
- [Configuring a user suspension](#) ▶42
- [Configuring a user lubricant](#) ▶43
- [Configuring operation mode](#) ▶43
- [The Options screen](#) ▶38

7.5.1 Control panel functions - TargetDoser







- A** Function keys - F1 to F4
- B** Scroll up/Scroll down
- C** Escape, Enter


Button	Function
 to 	Function key <ul style="list-style-type: none"> Press this button to activate controls for various purposes. See the bottom line of the individual screens.
	Scroll up <ul style="list-style-type: none"> Press this button to scroll up in a screen and to increase the value of a setting.
	Scroll down <ul style="list-style-type: none"> Press this button to scroll down in a screen and to decrease the value of a setting.
	Escape <p>Use this button on the control panel to return to previous functions or values.</p> <ul style="list-style-type: none"> Press the button to return to the main menu. Press the button to return to the last function or value. Press the button to cancel changes.
	Select/Enter <ul style="list-style-type: none"> Press this button to enter a field, for instance a setting, to select a value, and to confirm a selection.

7.5.2 Main menu - TargetDoser

From the **Main menu** screen you can choose between the following options:

-  • **Struers Methods**
-  • **User Methods**
-  • **Manual Functions**
-  • **Configuration**

7.5.3 Bottle configuration



Note
You must configure this setting before you start using the machine.

Use this option to define which suspensions or lubricants you are using in the bottles connected to the pumps.

Struers recommends that you use DiaPro consumables.

1. From the **Main menu** screen, select the **Configuration** screen.
2. From the **Configuration** screen, select the **Bottle configuration** screen.
3. Select the **Lub./Susp.** column.



Note

Bottle 7 can only be configured for OP or AP suspension.

4. Press **Enter** to toggle between lubricant and suspension.
5. Select the **Type** column.
6. Activate the **SELECT LUBRICANT TYPE** or **SELECT SUSPENSION TYPE** list.
7. Highlight the desired suspension or lubricant.
8. Press **Enter** to select.
9. Repeat the above steps for all bottles.
10. Set the status of the bottles as **Filled**.
11. Confirm your selections and return to the **Configuration** screen.



Refilling soap and alcohol bottles

1. Set the status of the bottles as **Filled**.



Note

You must fill both the soap and the alcohol bottles before you can set their status as **Filled**.

If you do not set the status as **Filled**, the system may show a warning message stating that one of the bottles may run dry during the preparation.



7.5.4 Configuring a user surface

You can define up to 10 new user-defined surfaces. You can define the name, the abrasive rule and the lubricant rule for each surface.

Procedure

1. From the **Main menu** screen, select the **Configuration** screen.
2. From the **Configuration** screen, select the **User surface configuration** screen.
3. Select the **Surface name** column.
4. Select the row indicating the surface you wish to configure.
5. Open the text editor.
6. Enter the name of the new surface.
7. Select the **Abr. rule** column.
8. Select the **SELECT ABRASIVE RULE** screen.
9. Select the desired abrasive rule.
10. Press **Enter** to select.
11. Return to the **Configuration** screen.

**Note**

Make sure that you select the correct rules for each surface, as this will affect the suspensions and lubricants that are available when you create a new preparation method.

7.5.5 Configuring a user suspension

You can define up to 10 new user-defined suspensions. You can define the name, the abrasion type and the lubricant rule for each suspension

1. From the **Main menu** screen, select the **Configuration** screen.
2. From the **Configuration** screen, select the **User suspension configuration** screen.
3. Select **Susp. name** column.
4. Select the row indicating the suspension you wish to configure.
5. Open the text editor.
6. Enter the name of the new suspension.
7. Select the **Abr. type** column.
8. Select the **SELECT ABRASIVE TYPE** screen.
9. Select the desired abrasive type.



10. Select the **Lub. rule** column.
11. Select the **SELECT LUBRICANT RULE** screen.
 - If the suspension used requires the use of a lubricant, select **Other lub. except water**.
 - If the suspension does not require a lubricant, select **No lubricant**.
 - If the abrasive is only to be used with water-free lubricants, select **Only waterfree lubricants**.
12. Press **Enter** to select.
13. Return to the **Configuration** screen.



7.5.6 Configuring a user lubricant

You can define up to 10 new user-defined lubricants. You can define the name and the lubricant type.

1. From the **Main menu** screen, select the **Configuration** screen.
2. From the **Configuration** screen, select the **User lubricant configuration** screen.
3. Select the **Lubricant name** column.
4. Select the row indicating the lubricant you wish to configure.
5. Press **Enter** to open the text editor.
6. Enter the name of the new lubricant.
7. Select the **Lubricant type** column.
8. Select the row indicating the lubricant you wish to configure.
9. Activate the **SELECT LUBRICANT TYPE** list.
 - If the lubricant contains water, select **Lubricant containing water**.
 - If the lubricant is waterfree, select **Waterfree lubricant**.
10. Press **Enter** to select.
11. Return to the **Configuration** screen.

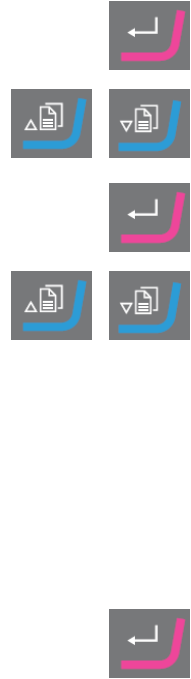


7.5.7 Configuring operation mode

You can restrict access to the software in the **Operation mode** screen.

1. From the **Main menu** screen, select the **Configuration** screen.
2. From the **Configuration** screen, select the **Operation mode** screen.

3. Configure **Current operation mode**.
4. Enter the pass code.
The default pass code is **176**.
5. Confirm the pass code.
6. Select the operation mode. The options are:
 - **Process**
Methods can be selected and viewed, but not edited.
 - **Development**
Methods can be selected, viewed and edited
 - **Configuration**
Methods can be selected, viewed and edited.
Bottles can be configured and the IP address can be reset.
7. Confirm the setting.



7.5.8 New pass code

When you access the **Operation mode** screen, you will be prompted to enter a pass code.

Changing the pass code

You can change the pass code from the **Operation mode** screen.

Note
Make a note of the new pass code.
The default pass code is **176**.

To change the pass code, do the following:

1. From the **Main menu** screen, select the **Configuration** screen.
2. From the **Configuration** screen, select the **Operation mode** screen.
3. Access the **Pass code** field.
4. Enter the pass code.
5. Access the **Pass code** field.
6. Access the **New pass code** field.
7. Enter the new pass code.
8. Confirm the new pass code.



7.6 Preparation methods

Preparation methods are stored in and loaded from TargetDoser.

See [Transmitting a method to TargetMaster ▶ 64](#)

In TargetMaster, removal is controlled by two separate measuring systems.

- Removal in grinding steps until 175 μm from the grinding/polishing transition
An electronic measuring system continuously measures the distance to the target. Consequently, the major part of the target distance is covered as quickly as possible.
- Removal down to the grinding/polishing transition and to the target.
A laser measuring system uses a relative measuring technique for a system accuracy of $\pm 5 \mu\text{m}$.

If a grinding step starts between 250 μm and 175 μm from the grinding/polishing transition, electronic measurement is not used in this interval, and the laser measuring system is used all the way to the target.

7.6.1 Plane grinding before starting preparation

When you work with critical specimens (small samples, or few samples, or samples with fine geometries), it is recommended that you first plane grind (planarize) the mount before starting the actual preparation. If the sample surface is not plane, this can result in incorrect initial measurements, which can affect the entire preparation.

Procedure

1. Select a **Time mode** method with a #800 SiC paper step.
2. Transfer the method to TargetMaster.
3. Edit the time for the #800 step to 1 minute.
4. Plane grind the specimen.



Note

For critical specimens, establish how the laser measuring system responds to the material: Perform a trial preparation of a similar specimen by using a higher Initial removal rate and a reduced rpm.

7.6.2 Methods - general recommendations

General method

- Plane grinding: #800 SiC Paper.
- Fine grinding (9 μm): MD-Sat, DiaPro, Allegro/Largo.
- Diamond polishing 1 (3 μm): MD-Dac, DiaPro Dac.
- Diamond polishing 2 (1 μm): MD-Nap, DiaPro Nap.

Ceramics and PCB


- As for general methods but PG with 20 μm Diamond Pad.

Brittle materials, e.g. silicon

- As for general methods but PG with #1200 SiC Paper.

7.6.3 User methods

You can store up to 20 user methods in each method group.



Note
User methods are not listed alphabetically in TargetDoser.

Each user method has a series of steps that are required for the preparation process. See [Editing method steps ▶ 49](#).

Creating a preparation method

You can create a preparation method in several ways:

- Create a preparation method. See [Creating a method ▶ 46](#).
- Change a preparation method and save it under another name. See [Editing a user method ▶ 49](#)

Storing capacity

You can store a maximum of 200 methods in up to 10 groups. Each group can contain up to 20 methods.

The User Methods screen

1. In the **Method groups** screen, select the correct method group.
2. Press **Enter** to activate the **Method groups** screen.



Creating a method

You can copy a method from the **STRUERS METHODS** folder or from the **USER METHODS** folder, save it under a name of your choice, and adjust it to suit your requirements.

Creating a method not based on Struers methods

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.
3. In the **Method groups** screen, scroll to the group where you wish to create the method.
4. Press **Enter** to open the method group.
5. Scroll to the method named **Empty method**. If the method group is new, only the method named **Empty method** is available.



6. Press **Enter** to edit the method.
7. Set up the method as needed. See [Editing a user method ▶49](#).
8. If you wish to rename the method, See: [Renaming a method ▶47](#)



Creating a method based on Struers methods

1. From the **Main menu** screen, select the **Struers Methods** screen.
2. Select the Struers method you wish to base the new method on.
3. Press **F1** to copy the method.
4. Return to the **Main menu** screen.
5. From the **Main menu** screen, select the **User Methods** screen.
6. Press **Enter** to activate the **Method groups** screen.
7. In the **Method groups** screen, scroll to the group where you wish to insert the method.
8. Press **Enter** to open the method group.
9. Press **F2** to insert the method in the group.
10. Press **Enter** to edit the method.
11. Set up the method as needed. See [Editing a user method ▶49](#).
12. Rename the method as needed. See: [Renaming a method ▶47](#)



Renaming a method

You can rename a method to a name of your choice.

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.
3. In the **Method groups** screen, scroll to the group containing the user method you wish to rename.
4. Press **Enter** to open the method group.
5. Scroll to the method you wish to rename.
6. Open the text editor and rename the method. See: [Renaming a method ▶47](#)



Copying a method



Note

When you copy a method, the name of the new method is prefixed with the words **Copy of**. Rename the method as needed.

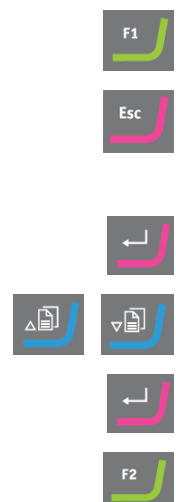
Copying a method not based on Struers methods

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.
3. In the **Method groups** screen, scroll to the group containing the method you wish to copy.
4. Press **Enter** to open the method group.
5. Scroll to the method you wish to copy.
6. Press **F1** to copy the method.
7. If needed, select another group, where you can insert the copy of the method.
8. Press **F2** to insert the method.
9. Press **Enter** to edit the method.
10. Set up the method as needed. See [Editing a user method ▶ 49](#).
11. If you wish to rename the method, See [Renaming a method ▶ 47](#).



Copying a method based on Struers methods

1. From the **Main menu** screen, select the **Struers Methods** screen.
2. Select the Struers method you wish to base the new method on.
3. Press **F1** to copy the method.
4. Return to the **Main menu** screen.
5. From the **Main menu** screen, select the **User Methods** screen.
6. Press **Enter** to activate the **Method groups** screen.
7. In the **Method groups** screen, scroll to the group where you wish to insert the method.
8. Press **Enter** to open the method group.
9. Press **F2** to insert the method in the group.



10. Press **Enter** to edit the method.
11. Set up the method as needed. See [Editing a user method ▶ 49](#).
12. Rename the method as needed. See [Renaming a method ▶ 47](#)



Editing a user method

You can add up to 20 steps in a user method. Each method step contains a list of process settings which you must define and save before you can add the method step to a user method.

You can copy and insert existing user method steps in user methods:

1. In the Method, mark the step you want to copy.
2. Press the Function key **Copy**.
3. Move to the method to which you want to copy the step, and press the Function key **Insert step**.

You can see the different steps in the **EDIT METHOD** screen.

You can transmit the edited method to TargetMaster from the **EDIT METHOD** screen.

Creating a method step

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.
3. In the **Method groups** screen, scroll to the group containing the user method you wish to edit.
4. Press **Enter** to open the method group.
5. Scroll to the method you wish to edit.
6. Press **Enter** to edit the method.
7. Scroll to **Empty Step**.
8. Edit the step. See [Editing method steps ▶ 49](#)
9. Save your changes.



The method is automatically sent to TargetMaster if the method is the current method in TargetMaster

Editing method steps

There are two types of polishing surfaces:

- Abrasive
- non-abrasive

The settings shown in the **EDIT METHOD** screen depend on the type of polishing surface you have selected. See also [Defining surfaces, lubricants and suspensions](#) ► 52:

Surface	Suspension	Lubricant
Abrasive	Not required	Water only
Non-abrasive	Diamond suspension. DiaPro or DiaDuo (All-in-one products)	Not required
	Diamond suspension (Water-based)	Water-based
	Diamond suspension (Water-free)	Water-free
	Oxide suspension	Not required

Procedure

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.
3. In the **Method groups** screen, scroll to the group containing the user method you wish to edit.
4. Press **Enter** to open the method group.
5. Scroll to the method you wish to edit.
6. Press **Enter** to edit the method.
7. Scroll to the method step you wish to edit.
8. Press **Enter** to edit the step.
9. Scroll to the setting you wish to edit.
10. Select the correct setting for **Surface, Lubricant** and **Suspension**.
11. Press **F1** and **F2** to move up or down the method steps.
12. Press **F4** to save your changes.



The method is automatically sent to TargetMaster if the method is the current method in TargetMaster.

Deleting a method step

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.



3. In the **Method groups** screen, scroll to the group containing the user method you wish to edit.
4. Press **Enter** to open the method group.
5. Scroll to the method you wish to edit.
6. Press **Enter** to edit the method.
7. Scroll to the method step you wish to delete.
8. Press **F4** to delete the step.
9. If you wish to rename the step, select **Rename**.
10. Press **F4** to save your changes.



The method is automatically sent to TargetMaster if the method is the current method in TargetMaster.

Setting Initial removal rate values

When you transfer a method to TargetMaster, the system automatically detects if there are Initial removal rate values available for all steps in the preparation method. If not, a message is shown on the screen of TargetMaster.

You must enter the Initial removal rate values manually for new individual surfaces. If needed, you can edit these values to optimize preparation time.

1. From the **MAIN MENU** screen, select the **Configuration** screen.
2. Press **Enter**.
3. From the **Configuration** screen, select the **Configuration of initial removal rates** screen.
4. Select the rate you wish to change.
5. Open the editor and change the settings.
6. Save the new settings and return to the **Configuration of initial removal rates** screen.
7. Return to the **Main menu** screen.



Process mode

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.



3. In the **Method groups** screen, scroll to the group containing the user method you wish to edit.
4. Press **Enter** to open the method group.
5. Scroll to the method you wish to edit.
6. Press **Enter** to edit the method.
7. Scroll to the **Process mode** method step.
8. Press **Enter** to edit the step.
9. Press **Enter** to toggle to the desired mode:
 - **Time mode**
 - **Removal mode**
 - **Target mode**
10. Press **F4** to save your changes.
 The method is automatically sent to TargetMaster if the method is the current method in TargetMaster.



Defining surfaces, lubricants and suspensions

The lists of available consumables depend on the surface you have defined. Use the same method to select surfaces, lubricants and suspensions.

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.
3. In the **Method groups** screen, scroll to the group containing the user method you wish to edit.
4. Press **Enter** to open the method group.
5. Scroll to the method you wish to edit.
6. Press **Enter** to edit the method.
7. Scroll to the method step you wish to edit.
8. Edit the step.
9. Scroll to the setting you wish to edit.
10. Select the correct setting for **Surface, Lubricant** and **Suspension**.



11. Move up or down the list of surface, lubricant or suspension.



12. Press **Enter** to select the consumable.



13. Save your changes.



The method is automatically sent to TargetMaster if the method is the current method in TargetMaster.

Setting dosing levels

When suspensions and/or lubricants are used in a preparation step, you must first select the type of suspension or lubricant, and then the dosing level.

In the **Level** field, you can set two values:

- Pre-dosing: the amount of suspension or lubricant applied onto the surface before the actual step is started.
- Dosing: this is the dosing level used during preparation. Set this level according to the type of surface you have selected.



For **Level** you can set two values: e.g. 2/7 (pre-dosing/dosing).

Option	Pre-dosing	Dosing	Increment
Dosing level	0 - 10	0 - 20	1

Example



The pre-dosing level [e.g. 2]

This value is the pre-dosing level, the amount of suspension or lubricant which is applied to the surface before the actual preparation step is started.

This lubricates the surface to prevent damage from occurring if the specimens were to run on a dry surface.

Applicable values depend on the frequency of use and surface types. For frequently used surfaces, use a lower value than for surfaces used infrequently.



The dosing level [e.g. 7]

This value is the dosing level throughout the preparation. This level is set according to the surface types: soft, napped polishing cloths require more lubricant than hard, flat cloths or fine grinding discs.

Fine grinding discs require a lower dosing level of abrasive than polishing cloths.

Procedure

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.
3. Scroll to the group containing the user method you wish to edit.



4. Press **Enter** to open the method group.
5. Scroll to the method you wish to edit.
6. Press **Enter** to edit the method.
7. Scroll to the method step you wish to edit.
8. Edit the step.
9. Scroll to the setting you wish to edit.
10. Select the correct settings for **Level**.
11. Select the desired setting.
12. Save your changes.
 The method is automatically sent to TargetMaster if the method is the current method in TargetMaster.



Changing dosing levels during a process

You can always change dosing levels for suspensions and lubricants during a process. See [Defining surfaces, lubricants and suspensions](#) ► 52.

Deformation in polishing steps

If you observe unacceptable deformation of the sample in any of the polishing steps, either reduce the force or use a less aggressive preparation surface. See [Editing method steps](#) ► 49.







Edit removal step

You can change individual steps in all modes from TargetMaster before you start the process.

1. From the **Main menu** screen, select the **Process** screen.
2. In the **Process** screen, press **F1**.to enter the first edit screen.
3. Enter the edit step screen.
4. Select the step you want to change.
5. Edit the selected step.
6. Change the values of the selected parameter.
7. Accept your changes.
8. Save your changes.



You cannot use the **F1** Edit step button in **Time mode**. To edit a step in this mode, do as follows:

1. Select the step you want to change.  
2. Edit the selected step. 
3. Change the values of the selected parameter.  
4. Accept your changes. 

Setting the Time/Accuracy factor setting













Adjust the **Time/Accuracy factor** setting (TAF) to select whether the highest accuracy or the fastest preparation has the highest priority.

Settings	Description
1	Faster preparation, less accuracy
2	Medium speed and accuracy
3	Slower preparation, highest accuracy



Note

For new preparation methods, Struers recommends that you use an initial setting of 3 for **Time/Accuracy factor**.

1. From the **MAIN MENU** screen, select the **Configuration** screen.  
2. Activate the **Configuration** screen. 
3. Select **Options**.  
4. Activate the **Options** screen. 
5. Select **Time/Accuracy factor**.  
6. Edit the value. 
7. Select the desired **Time/Accuracy factor** setting.  
8. Save the value and return to the **Options** screen. 



Note

During the preparation process you can see the selected **Time/Accuracy factor** setting in the bottom right hand side of the screen.

Deleting a method



Note

If the user method you wish to delete is the current user method in TargetMaster, you must first send a different user method to TargetMaster before you can delete the user method in TargetDoser.



Note

When you delete a user method, it is stored on the clipboard until you delete or copy another user method or step.

Procedure

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.
3. Scroll to the group containing the method you wish to delete.
4. Press **Enter** to open the method group.
5. Scroll to the method you wish to delete.
6. Press **F3** to delete the method.
7. If needed, select another group, where you can insert the deleted method.
8. Press **F2** to insert the method.



7.7 Optimizing a user method

If you are working with silicon

Use #800 SiC Paper for coarse grinding silicon. Continue with #1200 SiC Paper, if needed.

Typically, you can remove up to 1500 μm with one SiC Paper in less than 5 minutes. If you need to remove more than 1500 μm , insert a second #800 SiC Paper step in your method. In this step, you can set the removal rate to your desired value.

If a Diamond Pad is replaced with SiC Paper, the removal rates increase dramatically. Therefore, you must remember to change the Initial removal rate. The default setting is 720 μm , but you must increase it to a minimum of 1300 μm with SiC Paper.

For shortest possible preparation times, the rotational speed of the disc is set to 3000 rpm. Only use a SiC Paper once.

Fine grinding

MD-Largo has excellent properties and is suited for electronics with both very soft and very hard materials in the same matrix. However, over time plastic from the sample chair reduces the performance significantly, unless you clean the MD-Largo after each single use.

As an alternative, MD-Sat (plain woven acetate) is also suited for fine grinding using the same DiaPro, Allegro/Largo suspension as used on MD-Largo.

MD-Sat requires about 10 minutes of running-in before a stable removal rate is achieved, after which it will deliver high removal rates over a long period of time, without any cleaning. Be careful not to over-saturate the cloth with DiaPro, as this can cause aquaplaning of the sample.

Run in the MD-Sat using **Time mode** and an empty sample chair for 10 minutes.

When you replace MD-Largo with MD-Sat, removal rates increase dramatically. Therefore, you must make sure that the Initial removal rate setting is set at 22 μ m/min. The recommended IRR-value for MD-Largo remains at 9 μ m/min.

In **Target mode**, it is recommended that you set the removal on the fine grinding step to 40 μ m, due to the higher removal rate.

7.8 Starting and stopping the machine

Starting the machine



WARNING

Do not use the machine with defective safety devices.
Contact Struers Service.



CAUTION

When working at machines with rotating parts, take care to prevent clothes and/or hair from being caught by the rotating parts.



CAUTION

Keep clear of rotating parts during operation.



Note

We recommend that an exhaust system is applied when alcohol-based suspension or lubricants are used.

1. Set the speed control to the desired disc speed.
2. Press the **Start** button. The machine starts operating.
3. If needed, adjust the disc speed.



Stopping the machine

- Press the **Stop** button.



Emergency stop



Note

Activating the emergency stop on the machine will stop all movable parts.



Note

Do not use the emergency stop for operational stop of the machine during normal operation.

1. Press the emergency stop button to activate an emergency stop.



WARNING

Before you release the emergency stop, investigate the reason for activating the emergency stop and take any necessary corrective action.

2. Turn the emergency stop button to release the emergency stop.

7.9 Adjusting the rotational speed of the disc

To achieve a significantly higher removal rate increase the rotational speed from 150 rpm to 300 rpm. To reduce preparation times, select 300 rpm on both grinding and polishing steps. For some sensitive specimen types, the lower rpms are recommended.

On the grinding steps, test the removal rate before you prepare an actual sample. Alternatively, introduce a buffer step, i.e. an additional short grinding step between the grinding step and the fine grinding step.

7.10 Using a mold insert



Note

Using specimen carriers other than sample chairs has a significant effect on polishing dynamics. The Ø40 mm mold insert produces very high removal rates that can be difficult to keep track of for the measuring system. If you use mold inserts, reduce the rotational speed and force.

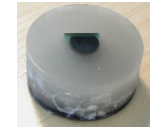
Struers recommends that your specimens are fully mounted in resin. Alternatively, use a smaller amount of resin to make it easier to recover your specimen after preparation.

For more information on preparation methods, see [Working with methods in TargetDoser](#) ► 59.

Mold insert



Fully mounted



Partially mounted



Note

If you are using a mold insert, seal the opening between the mold insert and TargetGrip with the O-ring supplied with TargetMaster. To be able to mount the O-ring and clamp the mold insert in TargetGrip, make sure that there is a minimum mounting level of 13 mm (0.5").

8 Operating the device

8.1 Working with methods in TargetDoser

The software includes a range of Metalog Guide methods, which you can use to set up your preparation methods.

You can work with the following types of methods:

- **STRUERS METHODS**

These methods are predefined. You cannot change the settings. If needed, copy them into the **USER METHODS** folder, and change the settings. See [Editing a user method](#) ► 49 Struers Methods ► 62

- **USER METHODS**

These methods you can copy and change as needed. See [User methods](#) ► 46.

Method groups

In TargetDoser you can create up to 10 method groups where you can store user-defined methods. Each method group can contain up to 20 user methods.

8.1.1 Preparation modes

You can choose between three preparation modes:

- **Time mode**
- **Removal mode**
- **Target mode**

In some cases, it can be necessary to edit steps in Preparation modes. See [Editing method steps ▶49](#).

8.1.2 Time mode

This mode runs for a specific period of time. Pre-grinding measurements are not necessary, but it can be a good idea to make some basic measurements, as this indicates how much material is actually removed.

Use **Time mode** for preparation steps with very low removal, e.g. oxide polishing or parallel polishing.

The Time mode screen

Before you press the **Start** button, the screen shows the total process time and time per step. If needed, you can edit the time step. See [Edit removal step ▶54](#)

Once preparation has started, the screen shows the time remaining.

8.1.3 Removal mode

If you inspect consecutive layers of a specimen on a regular basis, **Removal mode** will carry out removal of the layers to within an accuracy of +/- 5 µm and stops automatically when the value is reached.

You must enter the removal value manually as the total removal value in the **Process** screen on TargetMaster. See [Manually entering values ▶65](#).

Using Removal mode

If you have selected a Struers Method or User Method based on **Removal mode**, the screen shows the total removal value and the removal for each step.

Before the process starts, you can edit the removal values by selecting the value.

Once the process has started, the screen indicates the amount of material that still needs to be removed.

Removing thin layers with Removal mode

To obtain a high degree of control, which is required when you work with thin layers of samples, you can reduce the speed and the force. If the mounts are clamped directly into TargetGrip, reduce the rotational speed.

For example, when you are delayering chips, reduce the rpm to a minimum and reduce Force by 25-50%. Increase the Initial removal rate values by 25-50%. If needed, you can lower these values.

Using TargetX/TargetZ with Removal mode

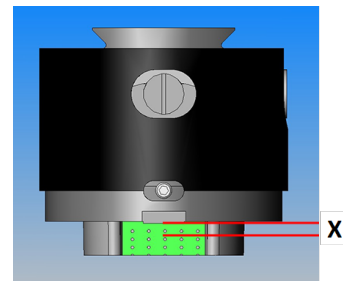
If you do not know the thickness of the layers, you can use TargetZ or TargetX to determine the thickness of the layer to be removed.

1. Make sure that the sample is mounted correctly in TargetGrip. The target area should be as parallel as possible to the reference plane.
2. Align the outermost edge of the sample chair with the vertical crosshair on the screen of the setup station. Set the setting to zero. This becomes the start reference point.
3. Use the controls on the setup station to move the sample until the crosshair is aligned with the target area.
4. The difference between the first measurement value (0) and this value is the removal value. This is the amount of material that is to be removed during the preparation process on TargetMaster.
5. Enter the manually measured removal value as the total removal value in the **Process** screen on TargetMaster. See [Manually entering values ▶ 65](#).

8.1.4 Target mode

Target mode requires accurate measurements of the distance from the reference edge on TargetGrip to the target area (distance **X** on the illustration).

Use TargetZ or TargetX to perform these measurements.



For information on how to use TargetX and TargetZ, see the instruction manuals for these units.

1. Make sure that the sample is mounted correctly in TargetGrip. The target area must be parallel to the reference edge.
2. Align the target area with the vertical crosshair on the screen of TargetX or TargetZ.
3. Set the setting to zero. This is the start reference point. Do not move TargetGrip on the Y-axis after this.
4. Use the controls on TargetX or TargetZ to move the sample until the lines on the screen are aligned with the reference edge on TargetGrip.
5. The difference between the first measurement value and this value is the target value (distance **X** on the illustration).

The Target mode screen

When you select a method based on **Target mode**, the screen shows the distance to the target and the distance per step. You can edit the target distance and removal rate per step at this stage. See [Manually entering values ▶ 65](#).

When you start the process, the screen shows the remaining distance to the target.

Time remaining to target

You can monitor the remaining distance on the screen while you carry out a preparation based on **Target mode**.

If the distance from the grinding/polishing transition is bigger than 175 μm , the electronic measurement system is used and the screen shows the distance counting down to zero.

Two grinding steps

When you select two consecutive grinding steps, up to 50 µm can be transferred automatically from the first to the second grinding step.

8.1.5 Struers Methods

Struers methods are a set of pre-defined methods, each identified by a letter corresponding to a material type with the same letter in the Metalogram in the Struers Metalog Guide.

You cannot change methods in the **Struers Methods** folder, but you can copy them to the **User Methods** folder, and change them, if needed.

8.1.6 Method groups

You can group preparation methods in method groups. Method groups are methods with common characteristics such as the same class or the same type of materials.

You can copy, move, edit, rename, and delete all the available preparation process data in the **Method groups** screen.

Procedure

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.



Copying a method

1. From the **MAIN MENU** screen, select one of the following screens:

– **STRUERS METHODS**

or

– **USER METHODS**



2. Select the method you wish to use.
3. Copy the method: Press **F1 - COPY**.



4. Press **Enter** to confirm your selection.



5. If you are copying a method from the **Struers Methods** screen:
 - Press **Back** to return to the **MAIN MENU** screen.



- Select the **User Methods** screen.



6. In the **User Methods** screen, select the field where you want to insert the new method.
7. Insert the method. Press **F2 - Insert**.
8. If you are using an empty method, the name automatically changes from **Empty method** to **Unnamed method**.
9. Press **Enter** to confirm your selection.



8.1.7 Creating method groups

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.



3. In the **Method groups** screen, scroll to **Empty Group**.



4. Activate the **USER METHODS - Empty Group** screen.



- Select **Empty method** and make some changes to the method. See [Creating a method ▶ 46](#).

or

- Copy a method into the group. Press **F2** to insert a method. See [Creating a method ▶ 46](#).



When you have changed the **Empty method** or **Empty Group**, the name automatically changes to **Unnamed method** or **Unnamed group**.

5. Use the **Rename** function to give the method or group a name of your choice.



8.1.8 Deleting a method group



Note

Before you can delete a method group, you must first delete all user methods in this group or move them to another group.

1. From the **Main menu** screen, select the **User Methods** screen.
2. Press **Enter** to activate the **Method groups** screen.



3. In the **Method groups** screen, select the method group you wish to delete.
4. Delete or move all user methods. See [Deleting a method ▶ 56](#).
5. Press **F3** to delete the selected group.
6. Press **Enter** to confirm the deletion.



8.2 Transmitting a method to TargetMaster

After editing a method, press **F4** to save the changes you have made. The method is automatically sent to TargetMaster.



Note

You can only transmit a method from TargetDoser to TargetMaster from the **Edit** screen.



Note

When a method is in use in TargetMaster, you can only edit the dosing values.

8.3 The preparation process

To operate TargetSystem correctly, follow the steps below in the order shown. Before starting, make sure that all instruments in the system are switched on.

Temperature

1. Make sure that the ambient temperature is 20°C (68°F) $\pm 2^{\circ}\text{C}$ (4°F).
2. Make sure that the temperature has been within the limit stated above for at least one hour before you start operating TargetMaster.
3. Make sure that the temperature of the sample holder is within the limit stated above .
4. To minimize the effect of temperature fluctuations, carry out the preparation process without taking long breaks between the steps.

Preparation

1. Fasten the sample to the sample chair or sample holder.
2. Mount the sample chair or sample holder on TargetGrip and secure it with the Allen screwdriver supplied.

Selecting a method

1. Select the correct preparation method on TargetDoser and transmit it to TargetMaster.

8.4 Obtaining and entering the target value

The target value is the distance from the reference plane on TargetGrip to the target area on the sample.

The removal value is the distance between the top of the sample chair and the target area.

TargetMaster automatically calculates the removal value based on the target value. See [Removal mode ▶ 60](#) and [Target mode ▶ 61](#).

1. Mount TargetGrip in TargetZ or TargetX and get the target value.
2. If you are using TargetZ to make a preparation in **Target mode**, send this value to TargetMaster. If you are making a preparation in **Removal mode**, note the removal value and enter it manually.
If you are using TargetX, note the value and enter it manually.
3. Remove TargetGrip from TargetZ or TargetX and, if you need to do so, apply resin to mount the sample.

8.5 Manually entering values

In both **Target mode** and **Removal mode**, you can change the target/removal distance before you start the process.

1. From the **Main menu** screen, select the **Process** screen.
2. Activate the **Process** screen.
3. Edit the target value or total removal.
4. Enter the setting.
5. Change the desired values.
6. Confirm the desired value.
7. Save your changes.



8.6 Starting up the preparation process on TargetMaster

In the TargetMaster screen:

1. Make sure that the preparation method times or distances are correct. Fine-tune, if needed.
2. Fit the correct preparation surface on the turntable.
3. Insert TargetGrip in the TargetMaster sample mover and use the supplied Allen screwdriver to secure it.

4. Press **Start** on TargetMaster to start the preparation procedure.
You can follow the progress on the screen.
5. If you have entered a wrong target value so that the target distance is larger than the sample height, an error message is shown and the machine stops. Enter the correct value before continuing.



8.7 The process

When TargetMaster is using **Target mode**:

Removal value = sample height - target value.

- The sample mover slides over to the laser measuring system where the sample height is measured. The sample height is the distance from the TargetGrip reference plane to the end of the sample.
- Removal is measured electronically at the beginning of the process.
- The sample mover positions itself over the rotating turntable, ready to start step 1 in the preparation procedure.
- When the electronic measuring system has determined that the remaining distance to the grinding/polishing transition is 175 µm or less, the laser measuring system is used for the rest of the process.
- The change-over takes place during grinding. When step 1 is complete, usually coarse grinding, the sample mover lifts the sample and transports the sample to the rinsing station.
- The sample is washed with soap, rinsed with water, and dried with alcohol and compressed air.
- The process loops, making laser measurements, grinding, and finally washing and rinsing the samples until the desired amount of material has been removed.
- The sample mover stops when the desired amount of material has been removed. A message on the TargetMaster screen prompts you to change the preparation surface.

Changing the preparation surface

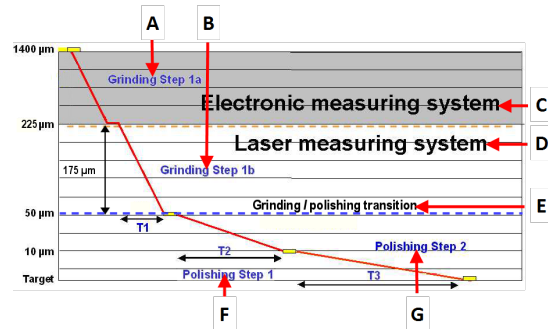
1. Follow the instructions on the screen.
2. Press **Start** on TargetMaster to continue the process.



The preparation process - an overview

A typical process is shown in this diagram.

- A Grinding step 1a
- B Grinding step 1b
- C Electronic measuring system
- D Laser measuring system
- E Grinding/polishing transition
- F Polishing step 1
- G Polishing step 2



8.8 Using SiC Paper

Never change SiC Paper in the middle of a step because TargetMaster cannot keep track of the removal rate if you change paper during a step.

If you need to change a SiC Paper, usually there should be 800 - 1000 µm of material left to remove.

If the paper tears below this threshold, put a finer grit paper on TargetMaster to avoid grinding past the target.

Usually, a single paper can remove as much as 1500 - 2000 µm. For the most efficient preparation, Struers recommends that you add a second plane grinding step using a new SiC Paper.

8.9 Spill-over and overshoot

If a laser measurement during removal shows that less than 9 µm remains before completion of a grinding step, the step is stopped and the difference is transferred to the next step.

In a polishing step, this happens if the shortfall is less than 3 µm. The transfer to the next step is called spill-over.

If too much material has been removed by grinding (overshoot), the polishing steps are corrected automatically.

If it is not possible to correct the process, the machine stops and an error message is shown. In this case, you may be able to successfully complete the preparation by entering a new method with just one polishing step to compensate.



Note

Overshoot happens very rarely. Possible causes are incorrect measurements due to a wet sample, or incorrect setting for Initial Removal Rate.

8.10 Changing the sequence of steps

In **Time mode** and **Removal mode**, you can manually change the step sequence, or you can repeat steps while a preparation is in progress.

You can also start a preparation on any of the steps.

1. Press **Stop** to pause the process.



2. Select the desired step.
3. Press **Start** to continue the process.



8.11 Manual functions

You can access manual functions during a preparation process.

1. Press **Stop** to pause the process.
2. Press **F2** to access the **Manual Functions** screen.
3. Select **Manual cleaning** or **Manual measurement**.
4. Press **Enter** to start the selected manual function.
5. Press **Esc** to leave the **Manual Functions** screen.
6. Press **Start** to continue the process.



8.12 Interrupting the process



Note

Do not interrupt the preparation process between the cleaning process and the laser measuring process.

Press **Stop** after the laser measuring process is finished.

1. Press **Stop** to pause the process.
2. Press **F1** to activate the **Remove sample** function.
3. Use the Allen key to loosen TargetGrip and remove it from TargetMaster.
4. Inspect TargetGrip.
5. Reattach TargetGrip to the sample mover and secure it with the Allen key.
6. Press **Start** to continue the process.



8.13 Completing the process

When all the steps in the preparation method are finished, you can see the **Process summary** screen. This screen shows the actual removal rates for each step and the total process time.

You can use the removal rates to optimize the Initial removal rate database values.

**Note**

Always allow a safety margin by adding 20% to the actual values.

- The sample mover moves from the measuring station to a position where it is possible to remove TargetGrip.
- The safety guard opens.
- Remove TargetGrip from the sample mover and inspect the target area.

8.14 Parallel polishing

Generally, you should reduce both rpm and force when you carry out parallel polishing. If the specimen does not contain silicon, it may not be necessary to reduce the force.

The following example is for a ball grid array. Preparation times are approximate.

Before using the parallel holder

- Place the O-ring under the flange of the parallel holder to prevent water from entering the cavity under the parallel holder.

8.14.1 Before mounting the sample

1. Change the settings as needed to a suitable method based on **Time mode**.
2. Reduce the rpm to 150.
3. Transfer the method to TargetMaster.
4. Add 50% to the Initial removal rate values in the database.
5. Make sure that TargetGrip is as level as possible.
6. Secure the tilt locking screw.
7. Make sure that the O-ring is in place in the parallel holder and clamp the parallel holder in TargetGrip.
8. Place the parallel holder in TargetGrip so that the clamping screw is facing the cut-out to the right of the reference edge.
9. Secure the TargetGrip locking screws.
10. Prepare with #800 SiC Paper for 30 seconds and align the parallel holder with the dovetail of TargetGrip.
11. Clean the parallel holder thoroughly with acetone.

8.14.2 Mounting the sample

1. Use thin, double-adhesive tape to mount the specimen on the parallel holder.
2. Place the specimen on the adhesive tape.
3. Make sure that the specimen is as close to the measuring tape as possible.
4. Make sure that the specimen is centered around the reference plane of TargetGrip.
5. Press the specimen onto the adhesive tape and secure it with superglue along the edges of the specimen.
6. Insert the measuring pin with the O-ring first. Make sure that the top of the measuring pin extends a few mm above the top of the specimen.
7. Lock the measuring pin.
8. When the measuring pin is inserted in the parallel holder, the end of the pin must not protrude more than 3.5 mm from the surface of the parallel holder. If it sits higher than that, it will collide with the laser well cover. Use a vernier gauge to check the height.



8.14.3 Grinding

1. Plane grind for a few seconds on #800 SiC Paper so that the measuring pin is level with the specimen.
2. Grind the specimen on MD-Dac for 15-20 seconds and check the specimen.
3. Repeat until the specimen is plane.
4. Transfer the specimen to TargetMaster and select a suitable removal method. Struers recommends Sat/9 μ m, Dac/3 μ m, Nap/1 μ m, and Op-S.
5. Stop at regular intervals and use an optical microscope to check the planeness. Use a micrometer dial gauge to measure the planeness/tilt of the sample.
6. Measure the height at the center of the sample, and then the sides.
7. Tilt the sample until you have compensated for any side-to-side difference.
8. Continue the procedure until you have reached the target.



9 Maintenance and service - TargetMaster

Proper maintenance is required to achieve the maximum up-time and operating lifetime of the machine. Maintenance is important in ensuring continued safe operation of your machine.

The maintenance procedures described in this section must be carried out by skilled or trained personnel.

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

For specific safety related parts, see the section "Safety Related Parts of the Control System (SRP/CS)" in the section "Technical data" in this manual.

Technical questions and spare parts

If you have technical questions or when you order spare parts, state serial number and voltage/frequency. The serial number and the voltage are stated on the type plate of the machine.

You can also find this information in the Duramin software by selecting **Tester > Info**.

9.1 General cleaning

To ensure a longer lifetime for your machine, Struers strongly recommends regular cleaning.

**Note**

Do not use a dry cloth as the surfaces are not scratch resistant.

**Note**

Do not use acetone, benzol or similar solvents.

If the machine is not to be used for a longer period of time

- Clean the machine and all accessories thoroughly.

9.2 Daily

- Clean all accessible surfaces with a soft, damp cloth.
- Check and refill the bottles.

9.3 Weekly

- Clean all accessible surfaces with a soft damp cloth and common household detergents.
- For heavy duty cleaning, use a heavy duty cleaning agent such as Solopol Classic.

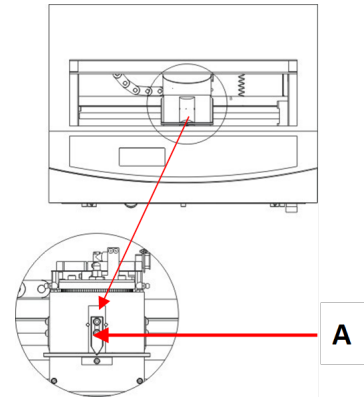
9.4 Tube cleaning

Always clean the tubes on the TargetDoser when you change bottles.

You must also clean the tubes if you have used oxide polishing media, such as OP-S, in preparation.

9.5 Monthly

- Clean the dosing head with a mild acidic solution or any other anti-limescale product to remove any calcium carbonate deposits.
- Rinse the dosing head thoroughly with clean water.
- Clean the registration pins and the corresponding cavities on the sample mover.



A Registration pin and cavity

- Clean the registration surfaces on each side of the spindle with a cotton bud and some alcohol.



B Registration surface

9.5.1 Cleaning the laser window

- Disconnect the electrical power supply.
- Carefully push the laser well cove aside and wipe the surface of the laser window with a cotton bud moistened with alcohol.

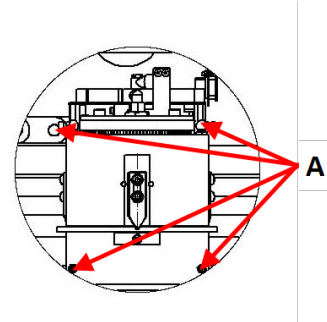
9.5.2 Cleaning TargetGrip

- Remove the three small screws.
- Remove the outer cover and clean any residue from inside the TargetGrip.
- Lubricate all moveable parts and reassemble.

9.6 Annually

9.6.1 Greasing the sample mover head

- Lightly grease the surface of the upper ring on the sample mover head, and grease the 4 nipples with Shell Albida EP2.

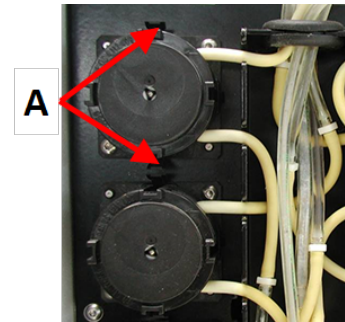


A Grease nipples

9.6.2 Changing tubes

The tubes on pump number 5 on TargetDoser are made of silicone because this material has a better resistance against alcohol, but it is not as long-wearing as the material used on the other pumps. Therefore, you must replace the silicone tubes on a yearly basis.

- Disconnect the doser tubes at the white couplings. The white couplings must stay on the tubes connected to TargetDoser.
- Press the two tabs [A] and remove the pump from the axle.



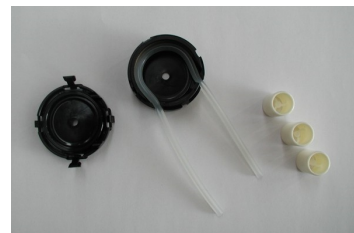
A Tabs

- Press the two tabs on the pump and remove the bottom cover.

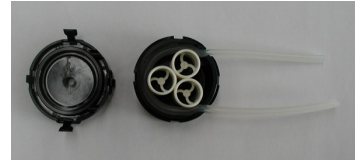


A Tabs

- Remove the 3 rollers and replace the silicone tube.



5. Replace the 3 rollers in the pump housing.
6. Re-mount the bottom cover.
7. Re-connect the tubes to the tubes on the TargetDoser. Press the pump back onto the axle.
8. Make sure that the tubes are correctly connected.



9.6.3 Testing safety devices

The safety devices must be tested at least once a year.



WARNING

Do not use the machine with defective safety devices.
Contact Struers Service.



Note

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

9.6.4 Emergency stop

Test 1

1. Press the **Start** button. The machine starts operating.
2. Press the emergency stop.
3. If operation does not stop, press the **Stop** button.
4. Contact Struers Service.



Test 2

1. Press the emergency stop.
2. Press the **Start** button.
3. If the machine starts, press the **Stop** button.
4. Contact Struers Service.



9.7 Spare parts

Technical questions and spare parts

If you have technical questions or when you order spare parts, state serial number and voltage/frequency. The serial number and the voltage are stated on the type plate of the machine.

For further information, or to check the availability of spare parts, contact Struers Service. Contact information is available on [Struers.com](https://www.struers.com).

9.8 Service and repair

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

When the machine is started up, the display shows information about total operation time and the machines service information.

After 1500 hours of operation time, the display will show a message reminding the user that a service check should be scheduled.



Note

Service must only be performed by a Struers engineer or a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).
Contact Struers Service.

Service check

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.

9.9 Disposal



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

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



For disposal of consumables and recirculation fluid, follow local regulations.

10 Troubleshooting - TargetMaster

10.1 Troubleshooting - TargetMaster

Error	Cause	Action
Noise when the machine starts, or the turntable will not turn.	The belt is not tight enough.	The belt must be tightened. Contact Struers Service.
The machine does not operate when the start switch is pressed.	The main switch is off.	Turn on the main switch.
	The fuse is blown (located at the back of the machine).	Replace the fuse.
Water is not draining away.	Drain hose squeezed.	Straighten the hose.
	Drain hose clogged.	Clean the hose.
	Drain hose does not slope downwards.	Adjust the hose to an even slope.
Water dripping underneath the machine.	Leak in water hose or defect in solenoid valve.	Turn the main switch off. Disconnect the unit from the electrical power supply. Turn the water supply off. Disconnect the unit from the water supply, if needed. Contact Struers Service.
Cooling water stops	Water tap on water supply closed.	Turn the water on.
	Built-in water tap closed.	Turn the water on.
	Built in water tap blocked	Clean water tap.
	Filter at the water inlet blocked	Clean the filter with compressed air only.

10.2 Messages and errors - TargetMaster

Error messages are divided into two classes:

- Messages and errors

10.2.1 Messages

Messages provide information about the machine's status and minor errors.

10.2.2 Errors

Errors must be corrected before operation can be continued.

Press **Enter** to acknowledge the error/message.

Error message	Explanation	Action
Air pressure too low!	This message is shown in connection with vertical movement of the sample mover.	The compressed air supply has been switched off, or the air pressure is lower than the minimum required.
Cleaning program not configured	You tried to start a manual cleaning process, but the selected cleaning program does not contain any active steps.	In the cleaning program configuration screen, make sure that the step time is larger than 0 seconds.
Deviation too large when measuring the reference surface! Reference surface or laser surface is wet or dirty.	This measurement is shown in connection with a laser measurement. The measurement of the reference surface shows too large a deviation compared to the preceding measurements.	<p>Make sure that the reference edge of the sample holder is clean and dry. If the surface is wet, there is a faulty condition in the cleaning function.</p> <p>If the surface is dry, make sure that there is no water under the laser: move the laser protection plate aside and clean carefully with a cotton swab.</p>
Disc motor or frequency inverter overloaded!	This message is shown in the course of a grinding or polishing operation if the disc motor or the frequency inverter is overloaded.	<p>Make sure that the method you are using is not causing a particularly heavy load on the motor. If this is the case, correct the method parameters.</p> <p>Let TargetMaster cool down and restart the process. If the error remains, contact Struers Service.</p>
Encoder error	This message is shown at power-up if the sample holder's horizontal position cannot be measured.	<p>Disconnect the electrical power supply. Wait 5 seconds and reconnect the power supply.</p> <p>If the error remains, contact Struers Service.</p>
Horizontal movement of sample mover blocked	This message is shown in connection with horizontal movement of the sample mover.	<p>Make sure that there are no obstacles preventing the movement of the sample mover.</p> <p>If the error remains, contact Struers Service.</p>
Laser displacement sensor not calibrated! Please call service technician	You have selected Start on TargetMaster, but the laser displacement sensor has not been calibrated.	Contact Struers Service.

Error message	Explanation	Action
No communication to TargetForce	This error message is shown if there is a communication error between the two internal boards in the TargetMaster.	Disconnect the electrical power supply. Wait 5 seconds and reconnect the power supply. If the error remains, contact Struers Service.
No communication to TargetDoser	This error is shown if there is no communication between TargetMaster and TargetDoser	Make sure that the TargetDoser is connected to the TargetMaster. If this is the case, disconnect the power supply. Wait 5 seconds and reconnect the power supply. If the error remains, contact Struers Service.
Removal rate too low! Either the sample doesn't touch the surface, or the grinding disc is worn down. Correct the error.	This message is shown in a grinding process when the removal rate falls to under 30 $\mu\text{m}/\text{minute}$.	Make sure that the sample has not been ground so far down that it no longer touches the grinding surface. If this is not the case, change the grinding disc. The maximum grinding depth of 6 mm may have been reached.
	Air pressure too low.	The air pressure supply must be at least 6 bars.
Removal rate too low! Either the sample doesn't touch the surface, or the disc/cloth is unable to remove material. Correct the error.	This message is shown if grinding or polishing has been in progress for more than 30 minutes without reaching the removal value for the step.	Make sure that the sample has not been ground so far down that it no longer touches the grinding surface. If this is not the case, change the grinding disc.
Sample motor error!	This message is shown in connection with the start of a horizontal sample movement, if the required rotational speed cannot be achieved.	Contact Struers Service.
Sample motor zero position not found!	This message is shown when the sample mover motor stops and the sensor that registers the parking position is not activated.	Contact Struers Service.


Error message	Explanation	Action
Start denied, the amount of material to be removed is zero or negative!	The step cannot be started because the removal value is zero or negative. Either a laser error has occurred or too much material has been removed in the previous step.	Remove the sample holder from TargetMaster. If the target has not been destroyed, measure the specimen again, and make a new method that matches the remaining distance to target. See Spill-over and overshoot ▶ 67 .
Target value error! Either the target is outside the sample, or the amount of polishing is too large. Please see Instruction manual.	A process has stopped because the specified target value is not valid in relation to the mounted sample and the method used.	The probable cause is that you have made a mistake in the measurement of the distance to target. Make a new measurement. If this is not the case, the removal values in one or more of the subsequent polishing steps must be reduced.
The deviation is too great, you have to perform the calibration again. If you get this message again, please contact a service technician. Deviation: xxx µm	This message is shown when a TargetZ calibration has been completed. The calibration has not been accepted; either because a fault has been made or because the adjustment made to TargetZ falls outside the tolerance limits.	Try to recalibrate TargetZ again. If the error remains, contact Struers Service.
The horizontal reference position is not found, try to restart TargetMaster	You have pressed Stop and the reference check process has been interrupted.	Disconnect from power, wait 5 seconds and reconnect power.
The inductive sensor used for finding the horizontal reference position was not activated! TargetMaster cannot continue.	This message is shown when you switch on the machine if a sensor has not been activated.	Disconnect from power, wait 5 seconds and reconnect power. If the error remains, contact Struers Service.
The safety guard switch is not activated!	This message is shown when you try to open the safety guard, but the sensor that registers that the safety guard is fully open does not activate.	Make sure that there is no physical blockage preventing the safety guard from closing completely. If the error remains, contact Struers Service.

Error message	Explanation	Action
The sample holder is not moving down!	A process has been started, but the sample holder is not moving downwards in its current position.	Make sure that there is no physical blockage preventing the sample holder from moving. If the error remains, contact Struers Service.
The sample holder is not moving up!	The sensor that measures the sample mover's vertical position has not registered that the sample holder is in the up position.	Make sure that there is no physical blockage preventing the sample holder from moving. If the error remains, contact Struers Service.
The sample is tilting, or protruding from the sample chair	This message is shown in connection with a grinding process, when a laser measurement indicates that no material has been removed since the preceding measurement.	No action required.
Too much material has been removed in this step! Your target is not necessarily destroyed, but you cannot continue with the actual method. Please read the instruction manual for further information.	Too much material has been removed in the step that has just been completed. It is not possible to compensate for this by reducing the removal values for the following steps. Either a laser error has occurred, or the Initial removal rate for the step was set too low.	Check the sample and the sample holder. The measurement surfaces should be clean and dry, unless there is a fault in the cleaning function. Check that the removal rate in the Configuration screen matches that of the current step. The value must be greater than the realisable removal rate. See Setting Initial removal rate values ► 51 If the target has not been destroyed, measure the specimen again, and make a new method that matches the remaining distance to target.

11 Technical data

11.1 Technical data - TargetMaster

Subject	Specifications	
Safety standards	See the Declaration of Conformity	
System accuracy	$\pm 5 \mu\text{m}$ at 20°C (68°F) $\pm 2^\circ\text{C}$ (4°F)	
Disc	Diameter	356 mm (14")
	Force	10-75 N in steps of 5 N
	Speed, Turntable	40-300 rpm in steps of 10 rpm
	Specimen holder	20-150 rpm in steps of 10 rpm
	Motor - Power consumption	250 W (0.33 HP)
	Torque at disc: Cont. at <300 rpm Max.	5.7 Nm (4.2 ft-lbf) > 10 Nm (7.4 ft-lbf)
Connected equipment	TargetZ	1
	TargetZ	1
	TargetDoser	
Operating environment	Surrounding temperature	20°C (68°F) $\pm 2^\circ\text{C}$ (4°F)
	Humidity	< 85 % RH non-condensing
Storage and transport conditions	Surrounding temperature	-20 – 60°C (-4 – 140°F)
	Humidity	35 - 50 % RH non-condensing
Software and electronics	Controls	Touch pad
	Memory	FLASH-ROM/RAM/NV-RAM
	Display	240 x 128 x 240 dots with back light

Subject	Specifications	
Power supply	Voltage/frequency	200-240 V/50/60 Hz
	Power inlet	1-phase (N+L1+PE) or 2-phase (L1+L2+PE) The electrical installation must comply with "Installation Category II".
	Power, nominal load	700 W
	Power, idle	16 W
Supply requirements	Pressure for tap water Water inlet Water outlet Air extraction Air extraction, main flow	<ul style="list-style-type: none"> • 1 - 9.9 bar (14.5 - 143 psi) • 1/2" or 3/4" • Diameter: 32 mm (1¼")
	Compressed air supply Compressed air pressure Compressed air quality Air extraction, main flow	<ul style="list-style-type: none"> • Diameter: 6 mm (¼") • 6-9.9 bar (87-143 psi) • In compliance with ISO 8573-1, 5.6.4 • Diameter: 32 mm (1¼") • 30 m³ (1059 ft³) per hour
Residual Current Circuit Breaker (RCCB)	Type B, 30 mA is required. <div style="border: 1px solid blue; border-radius: 10px; padding: 10px; margin-top: 10px;">  <p>Note Always follow local regulations.</p> </div>	
Dimensions and weight	Width	82 cm (32.3")
	Depth	86 cm (33.9")
	Height	59.5 cm (23.4")
	Weight	115 kg (253.5 lbs)

11.2 Technical data - TargetDoser

Subject	Specifications	
Safety standards	See the Declaration of Conformity	
Software and electronics	Controls	Touch pad
	Memory	FLASH-ROM/RAM/NV-RAM
Operating environment	Surrounding temperature	5 - 40 °C (41 - 104°F))
	Humidity	35-50 % RH non-condensing
Storage and transport conditions	Surrounding temperature	-20 – 60°C (-4 – 140°F)
	Humidity	35 - 50 % RH non-condensing
Power supply	Voltage/frequency	24 V DC, 1A supplied from TargetMaster
Dimensions and weight	Width	200 mm (8")
	Depth	
	with bottle tray	210 mm (8.3")
	without bottle tray	550 mm (21.7")
	Height	380 mm (15")
	Weight	
	with bottle tray	8.5 kg (18.7 lbs)
	without bottle tray	10 kg (22.1 lbs)
Capacity	Pumps	4 for suspension/lubricant 1 for OP-suspension 1 for soap 1 for alcohol
Dosing levels	Suspensions	0.2-4.0 ml in 20 steps
	All-in-one suspensions	0.2-12.0 ml in 20 steps
	Lubricants	0.2-12.0 ml in 20 steps
	OP-suspensions	20.0-90.0 ml in 20 steps

11.3 Safety Circuit Categories/Performance Level

Safety Circuit Categories/Performance Level	Emergency stop	PL c, Category 1 Stop category 0
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11.4 Noise and vibration levels

Noise level	A-weighted sound emission pressure level at workstations	$L_{pA} = 69 \text{ dB(A)}$ (measured value) Uncertainty $K = 4 \text{ dB}$ Measurements made in accordance with EN ISO 11202
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Vibration level	During preparation	Total vibration exposure to upper parts of the body does not exceed 2.5 m/s^2 .
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11.5 Safety Related Parts of the Control System (SRP/CS)



WARNING

Safety critical components must be replaced after a maximum lifetime of 20 years. Contact Struers Service.



Note

SRP/CS (safety-related parts of a control system) are parts that have an influence on safe operation of the machine.



Note

Replacement of safety critical components must only be performed by a Struers engineer or a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).
 Safety critical components must only be replaced by components with at least the same safety level.
 Contact Struers Service.

Safety related part	Manufacturer/Manufacturer description	Manufacturer catalogue no.	Electrical ref.	Struers catalogue no.
Emergency stop button	Rondex Latching mushroom head	ES Ø22 type RV	S1	2SA10400
Emergency stop contact	Rondex Modular contact, momentary	1 NC type MTO	S1	2SB10071
Module holder	Schlegel Module holder. 3 elem. MHR-3	MHR-3	S1	2SA41603

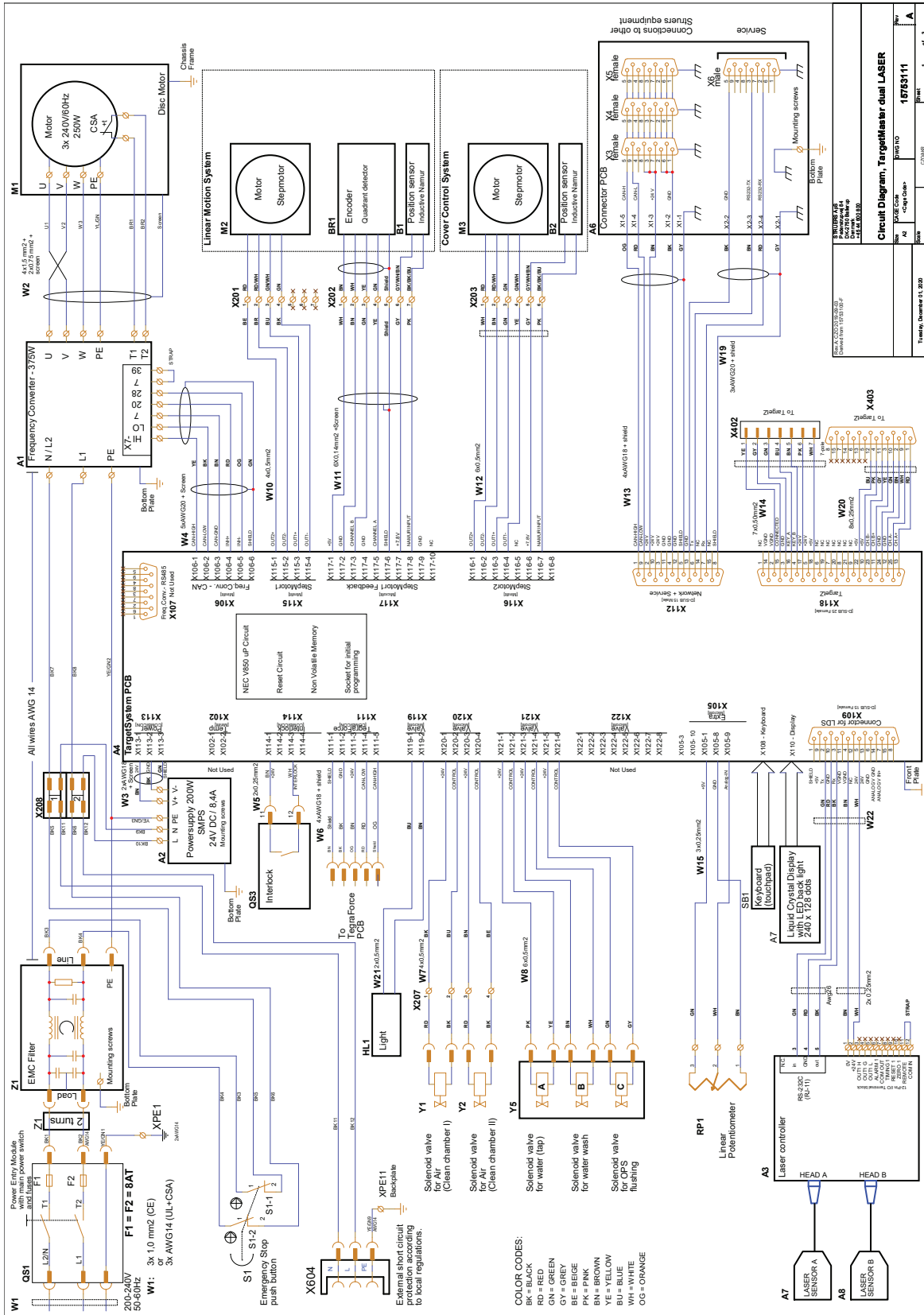
11.6 Diagrams

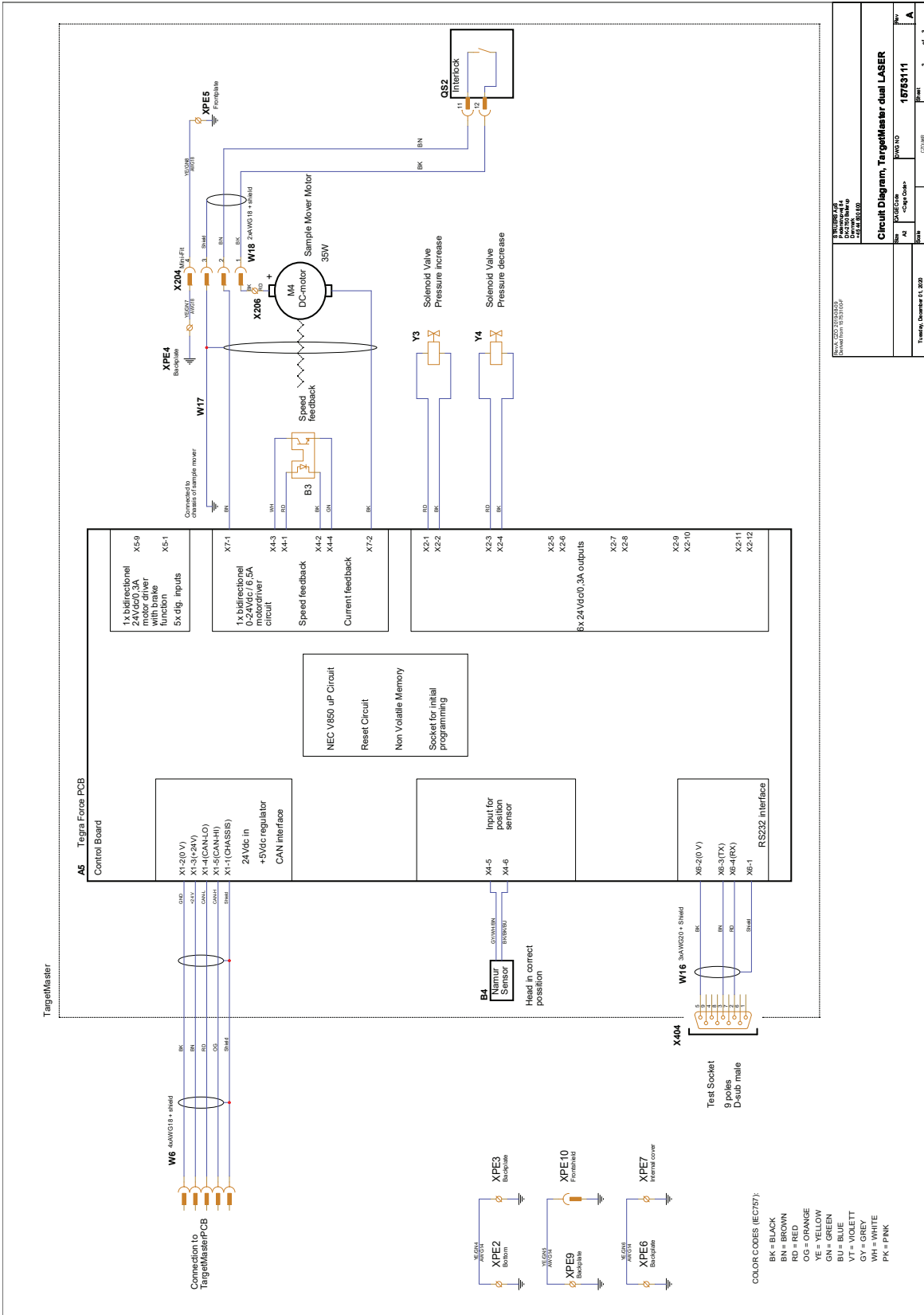
If you wish to view specific information in detail, see the online version of this manual.

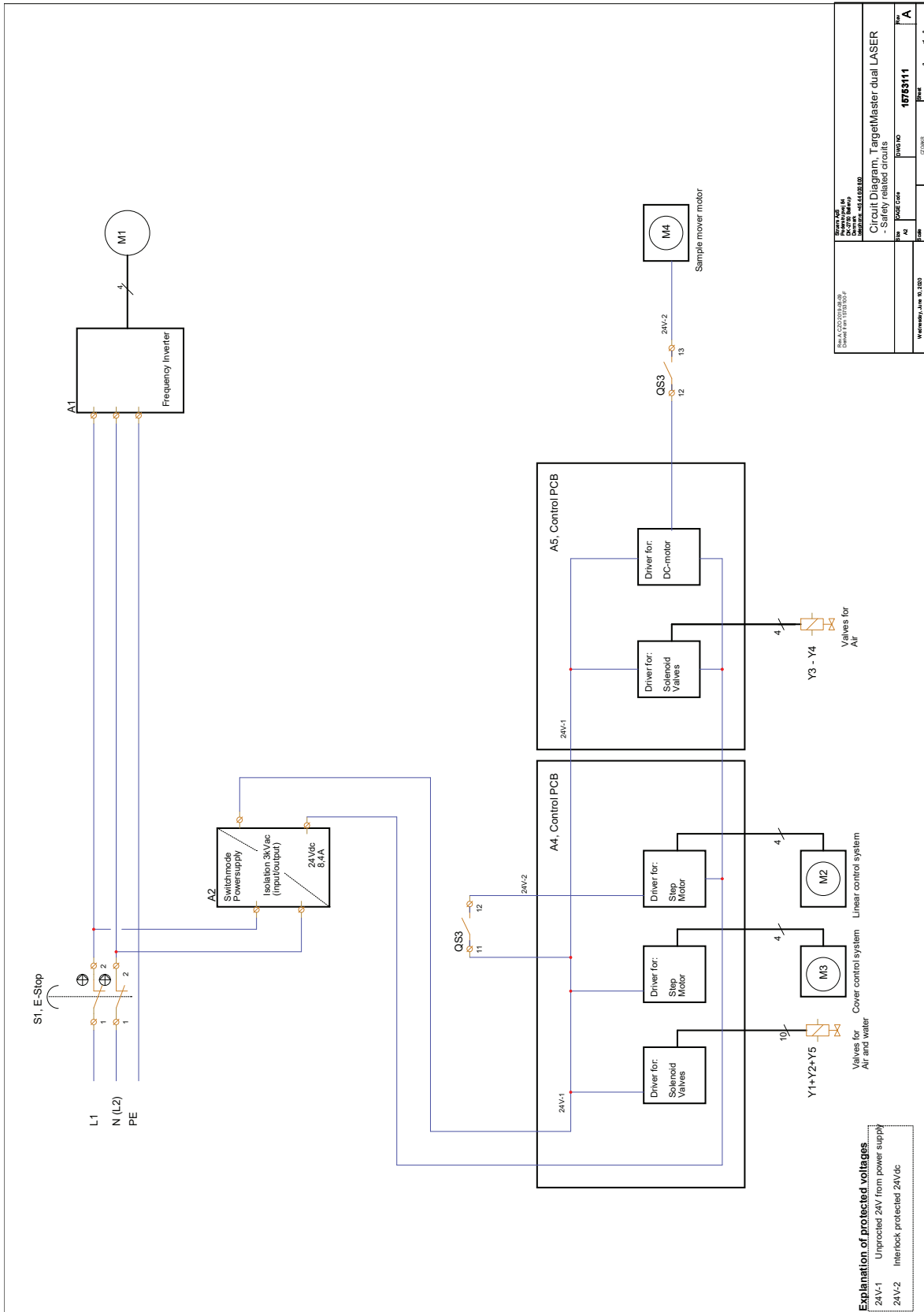
11.6.1 Diagrams - TargetMaster

Title	No.
TargetMaster, Block diagram	15753050 A ▶ 86
TargetMaster, Circuit diagram, (3 pages)	15753111 A ▶ 87
TargetMaster, Air and water diagram	15751005 A ▶ 90

15753111 A

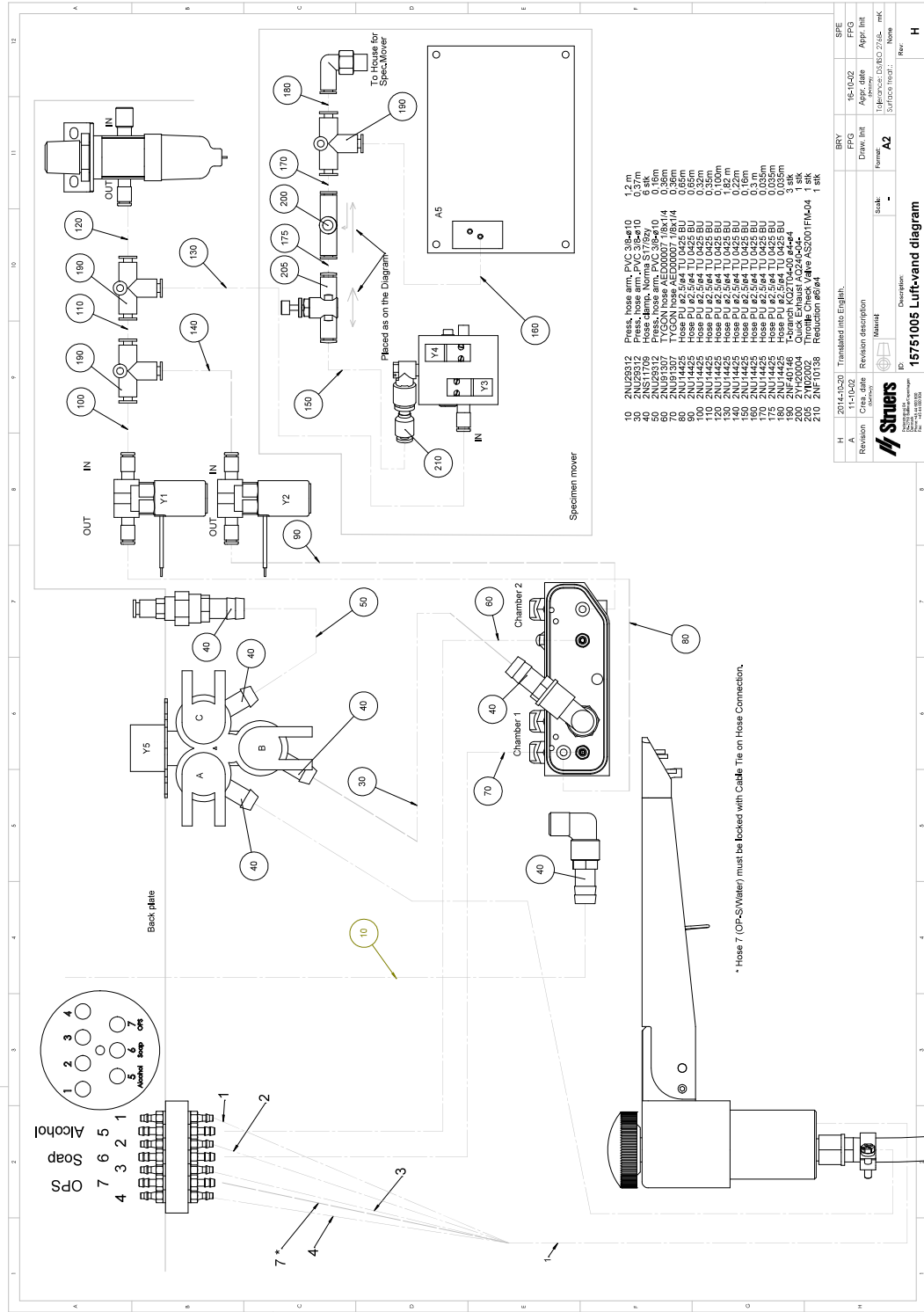






Project No. 15763111 Project Name: TargetMaster dual LASER Project Manager: ... Project Start: ... Project End: ...	
Drawn: ... Checked: ... Approved: ...	Date: ... Version: ... Scale: ...
Title: Circuit Diagram, TargetMaster dual LASER - Safety related circuits	Part No: 15763111
Date: ... Drawn: ... Checked: ... Approved: ...	Date: ... Version: ... Scale: ...

15751005 A

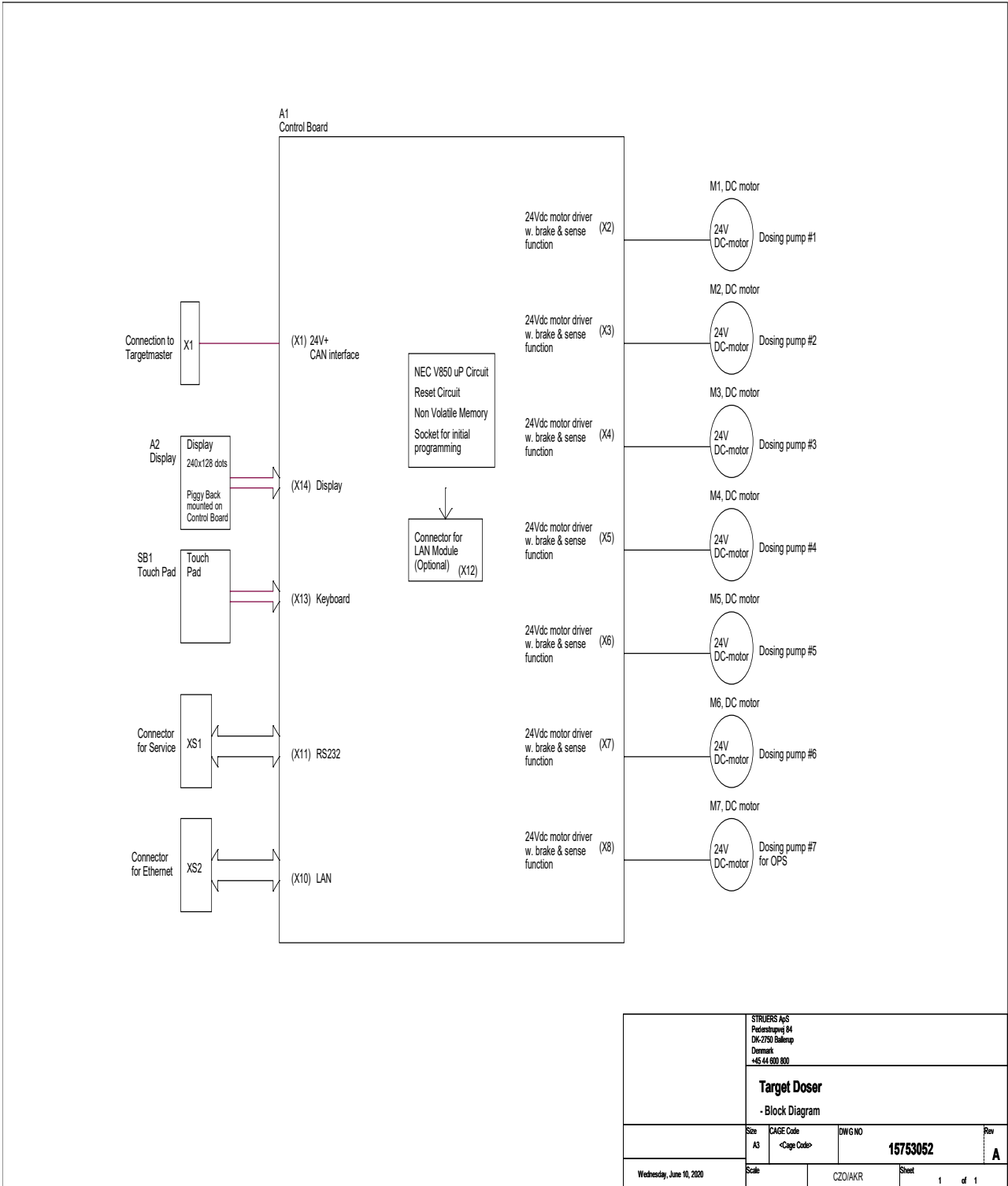


H	2014-03-20	Translated into English.	BRV	16-10-02	SFE
A	11-10-02		FRG	16-10-02	SFE
Revision	Cre. date	Revision description	Draw. Int.	Appr. date	Appr. Int.
			Format:	Tablet/CD/DVD/2165...	mk
			Scale:	Surface Int.:	None
					Rev
15751005 Luft-vand diagram					

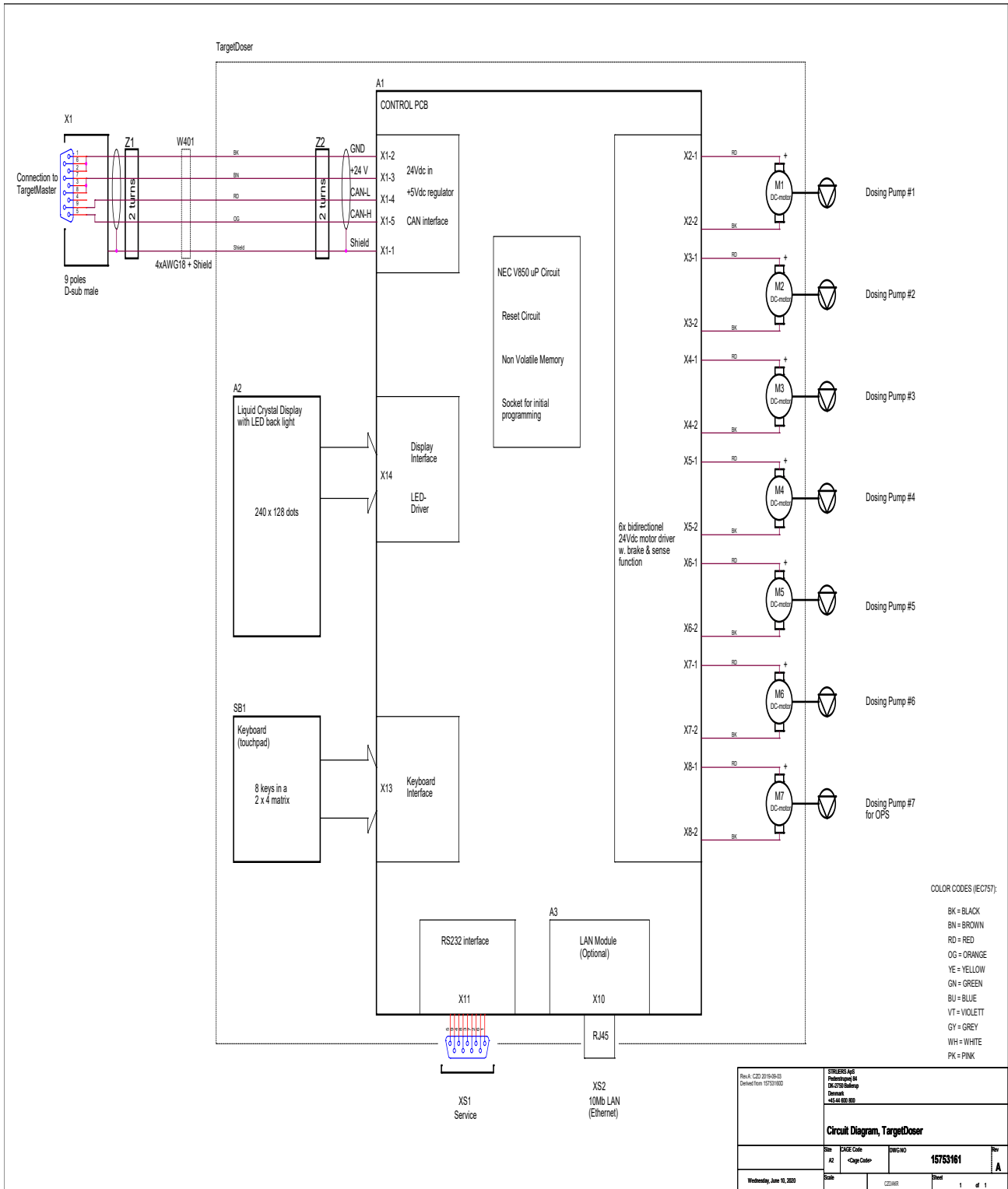
11.6.2 Diagrams - TargetDoser

Title	No.
TargetDoser, Block diagram	15753052 A ▶92
TargetDoser, Circuit diagram,	15753161 A ▶93

15753052 A



15753161 A



Rev. A, CD 20 (9-9-03) Original Rev. 02 (3-19-02)	STRIBERS AS Pulvermøllevej 84 DK-2700 Solbjerg Denmark +45 44 881 881		
Circuit Diagram, TargetDoser			
Rev. A2	ECDC Code C-App-Code	EWG/NO	15753161
Webstedt, Jan 11, 2020	Scale	CD/MS	Sheet 1 of 1

11.7 Legal and regulatory information

FCC notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

12 Pre-installation checklist

12.0.1 Installation requirements

- Forklift truck
- Electrical power supply cables
- External short circuit protection
- Compressed air supply

Accessories and consumables

Required accessories and consumables that have been ordered separately.

The use of Struers consumables is recommended.

- Preparation discs
- Specimen holder

For information about the available range, see:

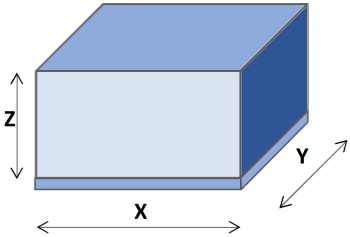
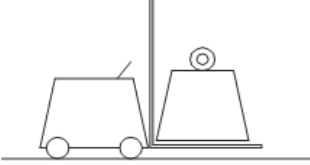
- [The Struers Consumables Catalogue](http://www.struers.com/Library) (<http://www.struers.com/Library>)

Recommended accessories

- Exhaust system

12.0.2 Packaging specifications

TargetMaster

X:	820 mm/32.3"	
Y:	916mm/36"	
Z:	884mm/34.8"	
Weight	115 kg/253.5 lbs.	

TargetDoser

X:	500mm/19.7"	
Y:	500mm/19.7"	
Z:	310mm/12.2"	

TargetX - (option)

X:	590mm/23.2"	
Y:	470mm/18.5"	
Z:	390mm/15.4"	

TargetZ - (option)

X:	374mm/14.8"	
Y:	370mm/14.8"	
Z:	528mm/20.7"	

12.0.3 Location

Supply requirements

The machine must be placed close to the electrical power supply, main water supply and waste water drain.

Supply type	Required	Not required
Power supply	Required	
Water supply	Required	
Waste water outlet	Required	
Compressed air	Required	
Exhaust		Not required

Ambient conditions		
Operating environment	Surrounding temperature Maximum system precision requirements	5-40°C/41-104°F 20°C/68°F ± 2°C/36°F
	Humidity	35-50 % RH non-condensing

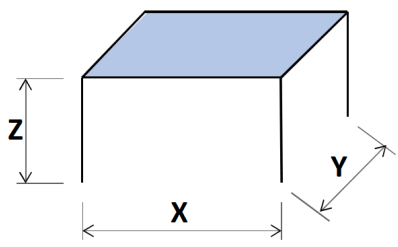
Table or workbench

The machine is designed to be placed on a table or work bench. The Struers table is optional.

The table must be able to carry at least:

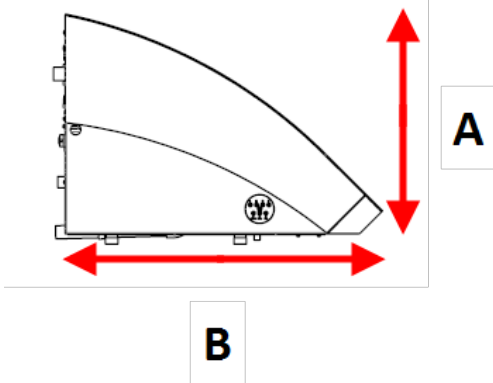
TargetMaster + TargetDoser	150 kg/330 lbs
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Recommended table dimensions	
X:	100 cm/40"
Y:	90 cm/35.5"
Z:	80 cm/31.5"

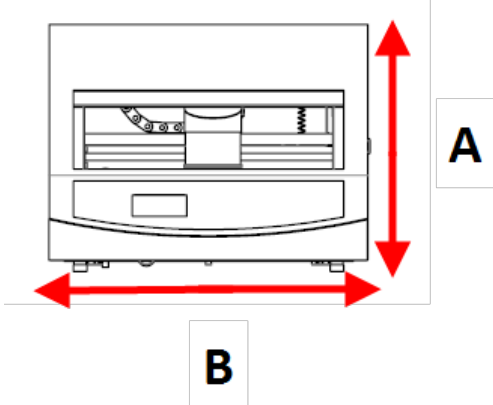


12.0.4 Dimensions

Side view	
A:	595 mm/23'4"
B:	860mm /33,9"



Front view	
A:	595mm / 23,4"
B:	820mm /32,3"



Footprint	
A:	820 mm/32.2"
B:	720 mm/28.3"

The diagram shows a top-down view of a machine. A vertical red double-headed arrow on the right side is labeled 'A', indicating the height. A horizontal red double-headed arrow at the bottom is labeled 'B', indicating the width. The machine has a control panel at the bottom and a main body above.

12.0.5 Recommended space

Space in front of the machine

- Make sure that there is enough room in front of the machine. 100 cm/40"

Space at the sides of the machine

- Recommended space at the sides of the machine. 100 cm/40"

Space at the rear of the machine

- The machine can be placed against a wall.
- Make sure that there is enough room behind the machine for access to the compressed air connection.

12.0.6 Transport and storage

If, at any time after the installation, you have to move the unit or place it in storage, there is a number of guidelines we recommend that you follow.

- Package the unit securely before transportation.
Insufficient packaging could cause damage to the unit and will void the warranty. Contact Struers Service.
- Struers recommends that all original packaging and fittings are kept for future use.

Long-term storage or shipping



Note

Struers recommends that all original packaging and fittings are kept for future use.

- Remove any other accessories.
- Clean and dry the unit before storage.
- Disconnect the unit from the electrical power supply.
- Place the machine and accessories in their original packaging.

12.0.7 Unpacking



Note

Struers recommends that all original packaging and fittings are kept for future use.

- Detach the machine from the packing crate by removing the four bolts on the bottom of the crate.

12.0.8 Lifting



CRUSHING HAZARD

Take care of your fingers when handling the machine.
Wear safety shoes when handling heavy machinery.



Note

Do not lift the machine by the light gray top part or by the water tap.
Always lift the machine from beneath.

Weight	
TargetMaster	115 kg (235.5 lbs)
TargetDoser	19 kg (41.9 lbs)
TargetX - (option)	21.5 kg (47.4 lbs)
TargetZ - (option)	15 kg (33 lbs)
TargetZ Monitor - (option)	8 kg (17.6 lbs)



Note

The straps must be approved for at least twice the weight of the machine.
The straps must be long enough so that they do not place stress on the cover of the machine.

You need a crane and two lifting straps to lift the machine off the shipment pallet.

Before lifting the machine into its final position, do as follows:

1. Remove the screws on the base of the packaging create and remove the top part of the crate.
2. Remove the metal brackets securing the machine to the pallet using a 4 mm Allen key.

3. Place the two straps under the machine.
4. Place the straps outside the feet on the machine.
5. Struers recommends the use of a lifting bar to keep the straps apart below the lifting point.
6. Lift the machine onto the table.

12.0.9 Power supply



ELECTRICAL HAZARD

Switch off the electrical power supply before installing electrical equipment. The machine must be earthed (grounded). Make sure that the actual electrical power supply voltage corresponds to the voltage stated on the type plate of the machine. Incorrect voltage can damage the electrical circuit.



Note

The equipment is shipped with 2 types of electrical power cables. If the plug supplied on these cables is not approved in your country, the plug must be replaced with an approved plug.

Power socket

The electrical power supply socket must be easy to access.

The electrical power supply socket must be located at a height ranging from 0.6 m to 1.9 m (2½" to 6') above floor level. Not higher than 1.7 m (5' 6") is recommended.

Cable length: 2.5 m/8.2'.

Single-phase supply

The 2-pin plug (European Schuko) is for use on single-phase electrical power connections.



2-phase supply

The 3-pin plug (North American NEMA) is for use on 2-phase electrical power connections.



Connection to the machine

Connect the electrical power cable to the machine (C14 IEC 320 connector).



The leads must be connected as follows:

Yellow/Green	Earth (ground)
Brown or Black	Line (live)
Blue or White	Neutral

Electrical data			
Electrical voltage/frequency	200-240 V/50-60 Hz		
Power inlet	1-phase (N+L1+PE), or 2-phase (L1+L2+PE). The electrical installation must comply with "Installation Category II".		
Equipment	TargetMaster	TargetX	TargetZ Monitor
Power, nominal load	700 W	50 W	30 W
Power, idle	16 W	10 W	16 W
Current, nominal load	3.5 A	0.25 A	0.2 A
Current, maximum load	6.9 A	1.0 A	2.0 A

Local standards may override the recommendations for the main electrical power supply cable. If necessary, contact a qualified electrician to verify which option is suitable for the local installation setup.

12.0.10 Safety specifications

Safety Circuit Categories/Performance Level	Emergency stop	PL c, Category 1 Stop category 0
----------------------------------------------------	----------------	-------------------------------------

12.0.11 Water supply

Water inlet



Note


New water pipe installations:
Leave the water to run for a few minutes to flush any debris from the pipe before connecting the machine to the water supply.

The machine is supplied with a 2 m/6.5" pressure hose with GEKA coupling to connect the machine to the water supply.

Water supply specifications	
Water pressure	1 to 4 bar/14.5 to 58 psi
Water flow	min 10 l/min (2.6 gpm)
Hose supplied	Diameter: 3/4". Length: 2 m/6.5". With standard connector
Tube connection	3/4" British Standard pipe thread. A Reduction ring with gasket to 1/2" is included.

Water outlet - drain

Water outlet specifications	
Hose supplied	3 m/9.8 Feet An angled piece (87°) is included.
Water outlet diameter	38 mm/1½"



Note
The use of a descaling agent is recommended to prevent the cleaning nozzles from being blocked by scale.

12.0.12 Compressed air

Specifications	
Pressure	6 - 9.9 bar/87 - 143 psi
Air consumption, approx.	30 l/min/8 gpm at atmospheric pressure
Air quality	Class-3, as specified in ISO 8573-1

TargetMaster is supplied with an inlet tube with an outside diameter of 6 mm/0.24", and a length of 1 m/3.28 Feet.

An 1/8" adapter is also included.

12.0.13 Exhaust

Minimum capacity: 30 m³/h (1059 ft³/h)

The connection to exhaust at the rear of TargetMaster is a hose of 38 mm / 1½" diameter. An angle piece with an angle of 87° and an outlet hose of 3 m / 9.8 Feet length are included for connection to an exhaust system.

12.0.14 X-ray connection

If you are using TargetX with TargetMaster, you must install a 5 m (16") connection cable into the x-ray machine.

Place the setup station on the table inside the x-ray chamber, and connect the setup station and the external console using the connection cable.

Place the console close to the x-ray monitor, as you need to be able to see the monitor while you work with TargetX.

Make sure that the connection cable inside the x-ray chamber is not too tight.

13 Manufacturer

Struers ApS
Pederstrupvej 84
DK-2750 Ballerup, Denmark
Telephone: +45 44 600 800
Fax: +45 44 600 801
www.struers.com

Responsibility of the manufacturer

The following restrictions should be observed, as violation of the restrictions may cause cancellation of Struers legal obligations.

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

The manufacturer is to be considered responsible for effects on safety, reliability, and performance of the equipment only if the equipment is used, serviced, and maintained in accordance with the instructions for use.

Struers ApS
Pederstrupvej 84
DK-2750 Ballerup, Denmark

Declaration of Conformity

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Model / Модел / Model / Model / Modell / Μοντέλο / Modelo / Mudel / Malli / Modèle / Model / Modell / Modello / Modelis / Modelis / Model / Model / Modelo / Modelul / Model / Model / Modell / モデル / 모델 / Modell / Модель / Model / 型号	TargetMaster
Function / Функция / Functie / Funktion / Funktion / Λειτουργία / Función / Functio / Toiminto / Fönction / Funkcija / Funkció / Funzione / Funkcija / Funkcja / Função / Funcția / Funkcia / Funkcija / Funktion / 機能 / 기능 / Funksjon / Назначение / Fonksiyon / 功能	Grinding/Polishing machine with automatic preparation, cleaning and laser measuring with ± 5µm accuracy.
Type / Тип / Typ / Type / Typ / Τύπος / Tipo / Tüüp / Tyyppi / Type / Tip / Tipus / Tipo / Tipas / Tips / Type / Typ / Tipo / Tipul / Typ / Tip / Typ / 種類 / 유형 / Type / Тип / Tür / 类型	05756128
Serial no. / Серийн номер / Výrobní číslo / Seriennummer / Seriennummer / Σειριακός αριθμός / N.º de serie / Seerianumber / Sarjanro / No de série / Serijski broj / Sorozatszám / N. serie / Serijos Nr. / Sērijas Nr. / Serien. / Numer seryjny / N.º de série / Nr. serie / Výrobné č. / Serijska št. / Seriennummer / シリアル番号 / 일련번호 / Serienr. / Серийный номер / Seri no. / 序列号	

CE
Module H, according to global approach

en We declare that the product mentioned is in conformity with the following directives and standards:	es Declaramos que el producto mencionado cumple con las siguientes directivas y normativas:	hu Kijelentjük, hogy jelen termék megfelel a következő irányelveknek és szabványoknak:	ro Declaram că produsul menționat este în conformitate cu următoarele directive și standarde:	ko 해당 선언서 상의 제품은 다음 지침 및 기준에 적합함을 선언합니다.
bg Декларираме, че посоченият продукт е в съответствие със следните директиви и стандарти:	et Kinnitame, et nimetatud toode vastab järgmistele direktiividele ja standarditele:	it Dichiaro che il prodotto citato è conforme ai seguenti standard e direttive:	sk Vyhlasujeme, že uvedený výrobok je v súlade s týmito smernicami a normami:	no Vi erklærer at produktene som er nevnt er i samsvar med følgende direktiver og standarder:
cs Tímto prohlašujeme, že uvedený výrobek je v souladu s následujícími směrnici a normami:	fi Vakuutamme, että mainittu tuote on seuraavien direktiivien ja standardien mukainen:	lt Pareiškiame, kad nurodytas gaminy's atitinka šias direktyvas ir standartus:	sl Potrjujemo, da je omenjeni izdelek v skladu z naslednjimi direktivami in standardi:	ru Настоящим заявляем, что указанная продукция отвечает требованиям перечисленных далее директив и стандартов:
da Vi erklærer herved, at det nævnte produkt er i overensstemmelse med følgende direktiver og standarder:	fr Nous déclarons que le produit mentionné est conforme aux directives et normes suivantes :	lv Mēs apstiprinām, ka minētais produkts atbilst šādām direktīvām un standartiem:	sv Vi intygar att den angivna produkten överensstämmer med följande direktiv och standarder:	tr Belirtilen ürünün aşağıdaki direktiflere ve standartlara uygun olduğunu beyan ederiz:
de Wir erklären, dass das genannte Produkt den folgenden Richtlinien und Normen entspricht:	hr Izjavljujemo da je spomenuti proizvod sukladan sljedećim direktivama i standardima:	pt Declaramos que o produto mencionado está em conformidade com as seguintes normas e diretivas:	ja 弊社はこの指定製品が以下の指令および基準に適合することを宣言します。	zh 我们特此声明上述产品符合以下指令和标准:
el Δηλώνουμε ότι το εν λόγω προϊόν είναι σύμφωνο με τις ακόλουθες οδηγίες και πρότυπα:				

2006/42/EC	EN ISO 12100:2010, EN ISO 13849-1:2015, EN ISO 13849-2:2012, EN ISO 13850:2015, EN ISO 14119:2013, EN ISO 14120:2015, EN 60204-1, EN 60204-1:2006/A1:2009/corr.:2010, EN 60204-1/Corr.:2010
2011/65/EU	EN 50581:2012
2014/30/EU	EN 61000-6-1:2007, EN 61000-6-3:2007, EN 61000-6-3-A1:2011, EN 61000-6-3-A1-AC:2012
Additional standards	NFPA 79, FCC 47 CFR Part 15 Subpart B

Authorized to compile technical file/
Authorized signatory

Christian Skjold Heyde
VP Operations

Date: [Release date]

Struers ApS
Pederstrupvej 84
DK-2750 Ballerup, Denmark

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Model / Модел / Model / Model / Modell / Μοντέλο / Modelo / Mudel / Malli / Modèle / Model / Modell / Modello / Modelis / Modelis / Model / Model / Modelo / Modelul / Model / Model / Modell / モデル / 모델 / Modell / Модель / Model / 型号	TargetDoser
Function / Функция / Functie / Funktion / Funktion / Λειτουργία / Función / Funktsioon / Toiminto / Focntion / Funkcija / Funkció / Funzione / Funkcija / Funkcie / Funkcja / Função / Funcția / Funkcia / Funkcija / Funktion / 機能 / 기능 / Funksjon / Назначение / Fonksiyon / 功能	Dosing unit for use with TargetMaster. TargetDoser has 7 peristaltic pumps for dosing diamond suspension lubricant. TargetDoser includes 500 ml and 1000 ml bottles. TargetDoser is controlled via a TargetMaster, a polishing machine for both mounted and unmounted samples that includes a laser with a measuring system of ± 5µm accuracy.
Type / Тип / Typ / Type / Typ / Τύπος / Tipo / Tíyp / Tuyp / Type / Tip / Típus / Tipo / Tipas / Tips / Type / Typ / Tipo / Tipul / Typ / Tip / Typ / 種類 / 유형 / Type / Тип / Tür / 类型	05756904
Serial no. / Серийн номер / Výrobní číslo / Seriennummer / Seriennummer / Σειριακός αριθμός / N.º de serie / Seerianumber / Sarjanro / No de série / Serijski broj / Sorozatszám / N. serie / Serijos Nr. / Sérijas Nr. / Serien. / Numer serijny / N.º de série / Nr. serie / Výrobné č. / Serijska št. / Seriennummer / シリアル番号 / 일련번호 / Serienr. / Серийный номер / Seri no. / 序列号	

CE
Module H, according to global approach

en We declare that the product mentioned is in conformity with the following directives and standards:	es Declaramos que el producto mencionado cumple con las siguientes directivas y normativas:	hu Kijelentjük, hogy jelen termék megfelel a következő irányelveknek és szabványoknak:	ro Declarăm că produsul menționat este în conformitate cu următoarele directive și standarde:	ko 해당 선언서 상의 제품은 다음 지침 및 기준에 적합함을 선언합니다.
bg Декларираме, че посоченият продукт е в съответствие със следните директиви и стандарти:	et Kinnitame, et nimetatud toode vastab järgmistele direktiividele ja standarditele:	it Dichiariamo che il prodotto citato è conforme ai seguenti standard e direttive:	sk Vyhlasujeme, že uvedený výrobok je v súlade s týmito smernicami a normami:	no Vi erklærer at produktene som er nevnt er i samsvar med følgende direktiver og standarder:
cs Tímto prohlašujeme, že uvedený výrobek je v souladu s následujícími směrnici a normami:	fi Vakuutamme, että mainuttu tuote on seuraavien direktiivien ja standardien mukainen:	lt Pareiškiami, kad nurodytas gaminy's atitinka šias direktyvas ir standartus:	sl Potrjujemo, da je omenjeni izdelek v skladu z naslednjimi direktivami in standardi:	ru Настоящим заявляем, что указанная продукция отвечает требованиям перечисленных далее директив и стандартов:
da Vi erklærer herved, at det nævnte produkt er i overensstemmelse med følgende direktiver og standarder:	fr Nous déclarons que le produit mentionné est conforme aux directives et normes suivantes :	lv Mēs apstiprinām, ka minētais produkts atbilst šādām direktīvām un standartiem:	sv Vi intygar att den angivna produkten överensstämmer med följande direktiv och standarder:	tr Belirtilen ürünün aşağıdaki direktiflere ve standartlara uygun olduğunu beyan ederiz:
de Wir erklären, dass das genannte Produkt den folgenden Richtlinien und Normen entspricht:	hr Izjavljujemo da je spomenuti proizvod sukladan sljedećim direktivama i standardima:	pt Declaramos que o produto mencionado está em conformidade com as seguintes normas e diretivas:	ja 弊社はこの指定製品が以下の指令および基準に適合することを宣言します。	zh 我们特此声明上述产品符合以下指令和标准:
el Δηλώνουμε ότι το εν λόγω προϊόν είναι σύμφωνο με τις ακόλουθες οδηγίες και πρότυπα:				

2006/42/EC	EN ISO 12100:2010, EN 60204-1, EN 60204-1-A1:2009, EN 60204-1/Corr.:2010,
2011/65/EU	EN 50581:2012
2014/30/EU	EN 61000-6-1:2007, EN 61000-6-3:2007, EN 61000-6-3-A1:2011, EN 61000-6-3-A1-AC:2012
Additional standards	NFPA 79, FCC 47 CFR Part 15 Subpart B

Authorized to compile technical file/
Authorized signatory

Christian Skjold Heyde
VP Operations

Date: [Release date]

