

# trotec

## SpeedMarker 300 fiber

Operating manual



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/ SETTING NEW STANDARDS

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### 1 Introduction

The SpeedMarker 300 fiber is a second generation of a high quality marking laser. The Yb fiber laser source means the system has an extremely long life cycle and minimal maintenance costs. This system is maintenance free apart from the filter pad and processing lens.

The combination of a high quality galvanometer scanner and a fiber laser produce highly precise marking results in short marking times.

This, together with the marking software and the available interfaces, provides a flexible and productive marking solution of the highest quality standards.

## 2 General Information

For the sake of readability, gender-neutral endings are not used in this operation manual. It is hereby expressly stated that all parts of the text where natural persons or groups of persons are mentioned refer to people of all genders.

### 2.1 Information about this manual

#### 2.1.1 Information about this manual

**Before beginning any work on the machine, read this manual completely and carefully.  
Keep the manual for further consultation close to the machine.**

This manual describes how to operate the machine properly and safely. Be sure to follow the safety instructions given here, as well as any local accident prevention regulations and general safety regulations applicable to the field of usage. Before beginning any work on the machine, ensure that the manual, in particular the chapter entitled “Safety Information” and the respective safety guidelines, has been read in its entirety and fully understood.



#### **Information**

Supplementary documentation can be found on the supplied storage medium. You can also request this from the manufacturer.

#### 2.1.2 General instructions for using the manual

The operating manual describes how to handle the device correctly and safely and guides you through the necessary steps for initial use. The operating manual also contains important information regarding system maintenance.



#### **Warning**

This operating manual must be read and followed carefully before commissioning and operating the device. Failing to observe individual points listed in this operating manual may result in personal injury and/or material damage to property!

This system may only be operated using devices and spare parts included in the scope of supply or the replacement or list of spare parts.

Ancillary devices must be calibrated to meet the safety and operational requirements of the base machine (please contact your dealer or the manufacturer with any queries).

### 2.2 Explanation of symbols

Important technical safety notes and instructions in this manual are indicated by symbols. It is important to observe and follow these notes and instructions on workplace safety. Avoid accidents, personal injury and material damage to property by acting with extreme caution.



#### **Danger**

This symbol indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



#### **Warning**

This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



#### **Warning Dangerous electrical voltage**

This symbol warns of potentially dangerous situations related to the electric voltage. Failure to observe the safety instructions leads to risk of serious injury or death. Particular care should be taken during maintenance and repair work.



#### **Warning Laser**

This symbol warns of potentially dangerous situations related to the laser beam. Failure to observe the safety instructions leads to risk of serious injury.



#### **Caution**

This symbol indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



#### **Notice**

This symbol indicates potential risks of damage to the supported product (or to property).

In addition, non-observance may result in damage, malfunction or failure of the machine.



#### **Information**

This symbol indicates tips and information which must be observed for efficient and trouble-free handling of the product.



#### **Disposal**

This symbol indicates notes regarding the professional disposal of the product or accessories.

### 2.3 Liability and warranty

Warranty periods specified in the manufacturers “warranty terms and conditions” shall be binding for the buyer. If no warranty periods are specified, the general terms and conditions of sale, delivery and payment apply.

All information, illustrations, tables, specifications and diagrams contained in this operating manual have been carefully compiled according to the current state of technology. No liability is accepted with regard to errors, missing information and any resulting damage or consequential loss.

Strict compliance with the safety procedures described in this operating manual and extreme caution when using the equipment are essential for avoiding and reducing the possibility of personal injury or damage to the equipment. The manufacturer shall not be liable for any damage and or faults resulting from nonobservance of instructions in this manual.

Nonobservance of the operation, maintenance and service instructions described within this manual absolves Trotec Laser GmbH from any liability in case of a defect.

Furthermore, Trotec Laser GmbH shall accept no liability whatsoever for damage caused by the use of non-original parts and accessories.

Additionally, Trotec Laser GmbH shall not be held responsible for any personal injury or property damage, of an indirect or specific nature, consequential loss, loss of commercial profits, interruption to business, or loss of commercial information resulting from use of the equipment described in this manual.

It is strictly prohibited to make any alterations, to prepare translations, decompile, disassemble, reverse engineer or copy the software.

Trotec Laser GmbH reserves the right to update any of the information, illustrations, tables, specifications and diagrams contained in this operating manual with regard to technical developments at any time without notice.

### 2.4 Scope of delivery (standard configuration)

- Power cord
- Software and manuals on storage medium
- Lens cleaning tissues
- Allen key set
- Key for Rack
- Key for PC (optional)
- Plug X11, X31, X71
- PC Recovery USB-Stick (optional)
- Exhaust connection cable (optional)
- Network cable

Monitor, keyboard and mouse are not included in the standard delivery.



#### **Notice**

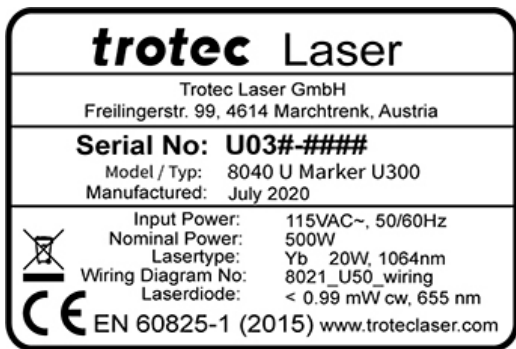
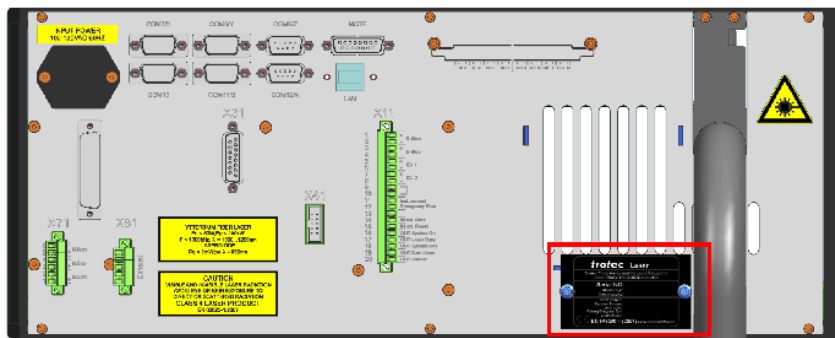
The system should be returned and transported in the original packaging.

## General Information

### 2.5 Type plate

The type plate contains information regarding the serial number, manufacturer, date of manufacture, connection values and consumption data.

The type plate is located on the reverse side of the laser rack.



Enter the serial number, model and year of construction of the machine here.

This data is important should the unit experience a fault and for ordering replacement parts.

Serial number:	
Model:	
Year of manufacture:	



## 3 Safety

### **TO AVOID POSSIBLE HARM READ AND FOLLOW THESE INSTRUCTIONS.**

The machine is built at the time of its development and production according to applicable, established technical rules and is considered to be safe to operate.

Dangers can be caused by the machine if the machine:

- is operated by unqualified personnel,
- the personnel have not been trained,
- the machine is used improperly or not as intended,
- or if the machine is used for other intended purposes.

This chapter provides an overview of all important safety aspects that are necessary for optimum protection of persons and safe and trouble-free operation of the machine. Other chapters of this manual contain specific safety notes for the avoidance and prevention of hazards.

### 3.1 General safety notes

#### **GENERAL SAFETY NOTES:**

- Only trained persons may perform activities on the machine.
- Safety devices, protective devices and machine parts must be present and must not be bridged. Faultless and intended function must be ensured.
- Work and control of the machine only by persons with sufficient knowledge of the function of the machine (applies especially to service operation).
- Never leave the machine unattended during operation. When the machine is not in use, turn off the main switch.
- Replace detached or damaged machine signage immediately.
- In the event of an unmanageable malfunction, switch off the machine and contact technical support in order not to damage the machine.
- The use of inferior spare parts or third-party components impairs the safety of the machine and renders the declaration of conformity (CE) supplied invalid.
- Protective equipment:  
Wear suitable work clothing and protective goggles matched to the laser (laser class 4).
- Exhaust system:  
Use suitable extraction equipment, as gases, fumes and other partially toxic by-products may be generated.
- Materials:  
Select suitable parameters for the corresponding material. Safely extract dusts so that no detectable residues or residues can collect in the work area.

### 3.1.1 Intended use

The SpeedMarker 300 fiber is a Class 4 laser marker as per DIN EN 60825-1 "Safety of laser products". It is intended for integration in systems and lines.

The product is intended exclusively for laser marking using the supplied marking software.

The following points should also be observed as part of the intended use:



#### Notice

- Only mark approved materials using suitable parameters.
- Perform maintenance and service according to the specifications in this operating manual.
- Use a suitable extraction system to remove fumes, dust or other reaction products.
- The machine may only be operated by suitably trained individuals.
- Observe effective safety regulations and the procedures described in this operating manual.

If the intention is to use the system for other applications, Trotec Laser GmbH should be informed in advance.

### 3.1.2 Improper use

Use of the machine for any purposes other than those intended or described in the present manual is regarded as improper and therefore prohibited. Trotec Laser GmbH will not accept any liability for damage caused by improper use. The operator is solely liable for all damages caused by improper use.

Non-observance of the operation, maintenance and service instructions described within this manual absolves Trotec from any liability in case of a defect.

### 3.1.3 Residual risk

Even if all safety regulations are observed, a residual risk remains when operating the machine.

The measures required to reduce all residual risks can be found in the following paragraphs of the chapter "[Safety](#)".

### 3.1.4 Machine modification

It is strictly prohibited to alter, refit or modify the machine in any way without the express consent of the manufacturer.

Likewise, it is strictly prohibited to remove, bridge or bypass any safety devices. Operating conditions and connection and setup values stated in the data sheet must be complied with at all times.

Operation of the system is permitted only with original parts and accessories by the manufacturer. Use of third-party parts affects machine safety.

### 3.1.5 Operating modes

#### NORMAL OPERATION

**For normal operation the following conditions must be met:**

- Intended use of the machine (see chapter “Intended use”).
- Operation of the machine only by trained personnel.
- Full functional and mounted safety devices.
- Machine must be in technically flawless condition.
- Processing of permissible materials according to the material list.
- Maintenance and service are not included.



#### Notice

During normal operation it is not necessary to wear safety glasses.

#### SERVICE OPERATION

Service activities may be carried out only by authorized, trained service technicians. If side panels as well as covers get removed and safety devices get bypassed, it can lead to direct and indirect scattered radiation. The service operation is therefore declared as laser class 4 (US: class IV) and proper precautions need to be taken (see “Laser classification”).

### 3.1.6 Applicable safety regulations

The following directives and guidelines must be observed to avoid hazards when operating Trotec laser systems:

#### GUIDELINES/REGULATIONS

2006/42/EC	EC Machinery Directive
2014/30/EU	EMC Guideline

#### APPLIED HARMONIZED STANDARDS

EN ISO 12100:2011-03	Safety of machinery - General principles for design - Risk assessment and risk reduction.
IEC 60825-1:2014, EN 60825-4:2011	Safety of laser products - Part 1: Equipment classification and requirements.
IEC 60204-1:2005	Safety of machinery - Electrical equipment of machines - Part 1: General requirements.
ISO/DIS 11553-1:2009-03	Safety of machinery - Laser processing machines - Part 1: General safety requirements.
IEC 61000-6-4:2007-02	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments.
ISO 13857:2008	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs.

EN 55011+A1:2016-05	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement.
IEC 60825-4:2012-01-01	Safety of laser products - Part 4: Laser guards



### Notice

#### Safety norms and regulations.

The general guidelines and directives listed within this manual may differ according to locality, region or country.

Therefore, always observe the directives as well as the regulations of the institutions for statutory accident insurance association applicable to you. The operator is responsible for fulfilling all safety requirements, as Trotec Laser GmbH has no influence on the proper use of the machine.

Observe the official regulations for your business location in accordance with the applicable local legal regulations (on accident prevention regulations or employee protection), e.g. DGUV regulation 11 for Germany.

## 3.2 Laser safety

### 3.2.1 Laser classification

The laser safety class indicates the risk potential based on the level of accessible laser radiation.

The SpeedMarker 300 fiber is a laser class 2 product and complies to the latest safety norms and regulations (IEC 60825-1).

With the option “pass-through” the laser system corresponds to class 4.

#### Class 1

The accessible laser radiation of Class 1 laser systems does not pose any hazard for the skin or eyes.

In order to operate as a Class 1 laser system, the following points must be observed:



#### Notice

- The entire course of the laser beam should be shielded to prevent radiation.
- Any covers providing access to laser areas which may be removed without using a tool should be fitted with suitable safety latches.
- Inspection windows in the housing should be fitted with safety glass suitable for the laser output and the shaft length of the laser (DIN EN 207).

#### Class 2 (US: class II)

The accessible laser radiation of Class 2 (US: Class II) laser systems does not pose any hazard for the skin. Diffuse reflections as well as any short-term irradiation of the eyes (exposure time max. 0.25 seconds) also pose no risk due to the low output power.

However, it is possible to suppress the natural eyelid closure reflex and stare into the class-2 laser beam for a time long enough for the eyes to get injured.

The product uses a Class 2 pilot laser. In order to prevent irritation of the eyes during operation, the operator should not look directly at the laser source. Diffuse reflections of the pilot laser are entirely harmless.

### **Class 4 (US: class IV)**

Class 4 (US: class IV) high powered lasers (visible or invisible) considered to present potential acute hazard to the eye and skin for both direct and scatter (diffused) conditions.

Also have potential hazard considerations for fire (ignition) and byproduct emissions from target or process materials. It is the responsibility of the operator of the machine to take appropriate measurements to eliminate any dangers such as fire or explosions through the laser beam.

Compliance with the points above does not absolve the operator from meeting the relevant standards and guidelines for the operation of a Class 4 laser system.



### **Warning Laser**

#### **Obligations of the operator for the operation of class 4 lasers (US: class IV):**

- Observe official regulations for the business location in accordance with the applicable local legal regulations (on accident prevention regulations or employee protection), e. g. DGUV regulation 11 for Germany.
- According to DGUV regulation 11 “Laser radiation”, as well as national regulations: Written appointment of a competent laser safety officer for compliance with the relevant regulations.
- Mark the danger zone as such by attaching warning lights and warning signs on the outside.
- Protect the danger zone against unauthorized access.
- Wear appropriate laser safety glasses within the danger zone that are matched to the wavelength and power of the laser.
- Install an additional and well visible warning light to warn the operator of the presence of laser radiation.

## 3.3 Areas of responsibility

### 3.3.1 Responsibilities of the operator

#### **The operator has the following responsibilities:**

- It is the responsibility of the operator to comply with the national official and statutory regulations for the operation of a class 4 (US: class IV) laser system or laser system with a build in laser source of class 4 (US: class IV).
- In addition to the safety notes and instructions stated in this manual, consider and observe the local accident prevention regulations and general safety regulations that apply at the operation site of the machine.
- A CO<sub>2</sub> fire extinguisher must always be at hand, as the laser beam can ignite flammable materials.
- If the machine is used industrially, the operator is subject to the legal obligations concerning industrial safety.

- All personnel involved in installation, set-up, operation, maintenance and repair of the machine must have read and understood this manual and in particular the “Safety” section. The personnel must be trained and informed about all the functions, potential dangers and safety issues of the machine on a yearly basis.
- The user is recommended to prepare company internal instructions considering the occupational qualifications of the personnel employed in each case, and the receipt of the instruction/this manual or the participation in the introduction/training should in each case be acknowledged in writing.
- Keep the manual in the immediate vicinity of the machine so that it is accessible at all times to all persons working on or with the machine.
- Authority for the individual activities relating to the application of the machine (e.g. installation, operation, maintenance and cleaning) must be clearly defined and observed, so that no unclear competencies result under the aspect of safety. This applies in particular to work to be performed on the electrical equipment that may only be performed by qualified specialists.
- Maintenance and repair work as specified in the manual must be carried out regularly.
- For all activities concerning installation, set-up, start-up, operation, modifications of conditions and methods of operation, maintenance, inspection and repair, the switch-off procedures that may be provided in the manual must be observed.
- Provide appropriate personal protection equipment (e.g. protective goggles according to wavelength and laser power).
- The operator is responsible for the safety-related state of the machine.
- Do not store any flammable materials in the working area or in the immediate vicinity of the device. Particularly, residues of processed materials have to be removed to prevent any fire hazard.
- The operator must ensure cleanliness and accessibility at and around the machine by corresponding instructions and controls.

### 3.3.2 Responsibilities of the operating personnel

#### **The operating personnel has the following responsibilities:**

- Always wear personal protective equipment.
- It is the duty of the operating personnel to check the machine before start of work for externally visible damage and defects, and to immediately report any changes that appear (including behavior during operation) that may affect the safety of the machine. It must be made sure that the machine is operated only in perfect condition.
- The machine must not be left unattended while it is operating (supervised operation).
- Switch off the machine described herein at the main switch for periods of non-use.
- Operate the machine described here only with a lens in place. A missing lens may cause the unfocused laser beam to be reflected out of the housing.
- Stop this machine immediately in case of failure.
- No working methods are permitted that affect the safety of persons or of the machine.
- The machine and its components, such as the lens and mirrors, are to be kept clean at all times.



#### **Caution**

The adjustment of the beam path may only be carried out by service personnel of Trotec Laser GmbH.

### 3.4 Requirements for operating an service personnel

**The requirements for the operating and service personnel are:**

- The personnel must have read and understood this manual and in particular the “Safety” section.
- The personnel must not be under the influence of drugs, alcohol or reactivity affecting medication when working on or with the machine.
- The personnel must be familiar with using the CO<sub>2</sub> fire extinguisher.
- The personnel must be trained in order to be qualified to operate the machine. If the personnel lack the necessary knowledge for working on or with the machine, they must first be trained and note down the training in the training verification form.

Activity	Intended user group	Definition
Control/operation/other activities (e.g. troubleshooting, maintenance)	Qualified personnel or Trotec service technicians	Qualified personnel are those who can judge the work entrusted to them and detect potential risks based on their occupational training, knowledge and experience as well as their understanding of the relevant regulations.

### 3.5 Machine identification (warning and safety stickers)

The warning and information signs are attached to the device at those places which could be a source of danger before commissioning or during operation. Therefore pay special attention to the information on the signs.



**Caution**

**Lost or damaged warning and safety stickers.**

If any warning and safety stickers are lost or damaged, the user is not able identify risks anymore, and there is danger of injury.

- Replace lost or damaged labels immediately.
- Contact your Trotec Laser GmbH dealer for details.



1 **Yb FIBER LASER:**  
 $P_{av} < 110 \text{ W}$ ,  $P_{cr} < 100 \text{ kW}$ ,  $E_{pr} < 2 \text{ mJ}$   
 $f = 1 \dots 1000 \text{ Hz}$ ,  $F < 2 \text{ MHz}$   
 $\lambda = 1055 \dots 1075 \text{ nm}$   
**PILOTLASER:**  
 $\lambda = 650 \text{ nm}$ ,  $P < 1 \text{ mW cw}$



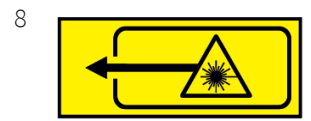
5 **CAUTION**  
 VISIBLE LASER RADIATION CLASS 2  
 WHEN OPENED  
 DO NOT STARE INTO BEAM  
 per IEC 60825 - 1:2015-07

7 **CAUTION**  
 VISIBLE LASER RADIATION CLASS 2  
 DO NOT STARE INTO BEAM  
 per IEC 60825 - 1:2015-07

2 **! ATTENTION !**  
 NEVER OPERATE THE LASER SYSTEM  
 WITHOUT CONSTANT SUPERVISION!  
 EXPOSURE TO THE LASER BEAM MAY  
 CAUSE IGNITION OF COMBUSTIBLE  
 MATERIALS WHICH CAN CAUSE  
 SEVERE DAMAGE TO THE EQUIPMENT!

4 **CAUTION**  
 INVISIBLE LASER RADIATION CLASS 4  
 WHEN OPENED AND  
 SAFETY INTERLOCKS DEFEATED  
 AVOID EYE OR SKIN EXPOSURE TO  
 DIRECT OR SCATTERED RADIATION  
 per IEC 60825 - 1:2015-07

6 **CAUTION**  
 INVISIBLE LASER RADIATION CLASS 4  
 WHEN OPENED  
 VOID EYE OR SKIN EXPOSURE TO  
 DIRECT OR SCATTERED RADIATION  
 per IEC 60825 - 1:2015-07





## 3.6 Secondary (indirect) hazards

### 3.6.1 Fire hazard



#### **Warning** **Fire hazard**

Fire hazard from gas and processing of inflammable materials.

- Do not operate the device without supervision.
- Keep CO<sub>2</sub> fire extinguisher ready at hand in the immediate vicinity of the device.

If a main laser beam hits easily flammable material, e.g. paper, this may ignite and a fire can quickly occur. Therefore, before switching on the laser, you should make absolutely sure that there is no easily flammable material in the beam path.

Furthermore, gases that can form below the material to be processed may ignite. Especially if the extraction requirements are not met.

Inadequate care and cleaning of the system increases the risk of flame formation.

Regularly check the cooling slots of the cooling system.

### 3.6.2 Gases, fumes and dust

Depending on the materials being processed and the parameters selected, laser processing may generate gases, fumes, aerosols or dust. Depending on the material, such by-products may be toxic. In individual cases, the reaction products may be electrically conductive dusts. If these enter electric systems, short-circuiting with personal injury and property damage may occur.

The operator is responsible for ensuring presence of a suitable extraction system and compliance with the relevant guidelines in order to protect persons and the environment. Find out about local guidelines.

The operator must also ensure that gases, fumes or dust do not settle on the processing lens. Any dirt accumulating on the processing lens can lead to loss of performance, poor processing results and damage to the device.

## 3.7 In case of emergency

### **WHAT TO DO IN THE EVENT OF MALFUNCTIONS**

- In unusual operating conditions, open the lid to stop the machining process press the emergency stop button and switch off the machine.
- If necessary, disconnect the machine from the main power supply.
- Inform the laser protection officer and your supervisor.

- Repair work must only be carried out by Trotec Laser GmbH service technicians.
- In the event of a fire: Fight the fire with a CO<sub>2</sub> fire extinguisher as far as is possible without risk.



### Notice

After a deletion, Trotec Technical Support must be involved before the system is put back into operation.

### WHAT TO DO IN THE EVENT OF AN ACCIDENT, FIRST AID

- If eye damage occurs due to laser radiation, the casualty must present to an ophthalmologist immediately.
- First aiders must protect themselves.
- Disconnect the device from the power supply and secure it against restarting
  - Remove the key switch.
  - Unplug the power cable.
- Rescue the injured person from the danger area and provide first aid.
- Call an emergency doctor!

## 4 Before commissioning

- Read the operating manual and ensure it is accessible at all times.
- The ambient temperature must be between +15 °C and +25 °C (59 °F and 77 °F) and not exceed the relative humidity of 45-65% (non-condensing). Non-observation leads to damage.
- A laser system consists of high quality electrical and optical components. Mechanical stresses, vibrations and impacts must always be avoided.
- If the system has been subject to significant temperature variations, it must be brought back to room temperature before being commissioned.
- Sufficient air must be supplied to the 19 inch module of ventilated systems. The accumulation of heat due to covered ventilation slots or filter pads can damage the system.
- Assemble the device at the point of installation according to the instructions.
- The operating personnel must read and understand the operating manual, in particular the chapter on "Safety notes". It is recommended that the operator compiles with inhouse instructions regarding safety and operation and that the receipt of these instructions/operating manual and the participation in briefings/training courses is confirmed in writing.
- Laser marking may generate gases, fumes and other reaction products on the surface of the material. The operator must therefore use an effective extraction system.

### 4.1 Unloading, inspection and reporting faults

#### In the event of transportation damage or incomplete delivery:

- Record all details in writing immediately.
- Note all claims on the transportation documents.
- Photograph any damage.
- Send report to Trotec Laser GmbH.

#### Nach dem Entladen:

- Remove all transport packaging.
- Check the delivery for completeness.
- Inspect the machine and machine components for transportation damage.



#### Warning

On delivery the marking head is firmly attached to the laser rack using the fiber optic cable. The fiber optic cable is enclosed with the jumper cables in a black tube for protection.

Avoid any unnecessary stretching or bending of the fiber optic cable. This could damage the fiber optic cable.

- The lens unit should only be uncovered following installation.
- The lenses are high quality optical components which must be kept clean in order to ensure optimum marking results.
- Never touch the lenses with bare fingers!

### 5 Transport and Storage

#### 5.1 Transport conditions

- When transporting outside, always transport in a covered vehicle or one with sufficient weather-proofing.
- Protect the machine against transportation damage using straps and inserts, and leave sufficient distance between other transported items.
- Ambient temperature for transportation:  
minimum temperature 10°C  
maximum temperature 40°C
- Handle the machine and machine components with care.
- Do not place any heavy loads on the machine or machine components.
- Avoid heavy impacts.
- Take particular care when transporting electronic components.

##### Transport conditions

Transport temperature (ambiente temperature):	-10 °C to +40 °C (14 °F to 104 °F)
Relative humidity:	Maximum 70%, non-condensing

- Avoid high temperature fluctuations.

#### 5.2 Storage conditions

- Store the machine and machine components in a dry location.
- Protect the machine and machine components against scratches.
- Take particular care when packing away electronic components.
- When storing for a long period, preserve bare metal parts (e.g. apply oil).

##### Storage conditions

Storage temperature (ambiente temperature):	0 °C to +30 °C (32 °F to 86 °F)
Relative humidity:	Maximum 60%, non-condensing

- Avoid high temperature fluctuations.

#### 5.3 Place of storage

Storage room or boxed with sufficient weatherproofing. The storage location must be free from corrosive elements, fumes and flammable materials.

## 5.4 Transport inspection and reporting of defects

- Immediately after receipt inspect the delivery to ensure that it is complete and has not suffered any damage.
- If any transport damage is visible, do not accept the delivery, or accept it only with reservation.
- Record the scope of the damage on the transport documents or delivery note.
- For all defects that are not discovered upon delivery, be sure to report them as soon as they are detected, since damage claims must be filed within a certain period, as mandated by law.

## 6 Setup and installation

### 6.1 For your safety



#### Notice

The setup has to be carried out by Technical Support.

### 6.2 Temperature and humidity

#### Ambiente conditions

Operating temperature (ambiente temperature):	+15 °C to +35 °C (59 °F to 95 °F)
Relative humidity:	max. 60%, non-condensing

- If the system has been exposed to large temperature fluctuations, it must first be brought back to room temperature before commissioning.

#### ENVIRONMENTAL CONDITIONS

- Provide sufficient illumination at the workplace.
- Ensure a dust-free environment (II° according to IEC60947-1).
- Shielding from EMC.
- Freedom of interfering electrical installations, hoses and pipe lines.
- Power supply free of fluctuations.

### 6.3 Installation location

#### INSTALLATION LOCATION

##### The installation location must:

- Have a stable power supply.
- Be vibration free.
- Have sufficient air supply for the laser rack and PC.

### 6.4 Mechanical installation

The correct, stable and reproducible alignment of the working head in relation to the workpiece to be marked is a prerequisite for faultless marking results. The marking head should therefore be installed with appropriate care.

### FIBER OPTIC CABLE

The working head is connected to the actual laser source in the laser rack via an approx. 2.9 m long fiber optic cable. The fiber optic cable is enclosed with the jumper cables in a black protective tube for protection. In order not to damage the filaments, do not bend the cable by a radius of more than 66 mm. The tube should also not be subject to any mechanical stresses.



#### Caution

If necessary, the cable and the fiber optic cable may be disconnected from the marking head. As this will expose sensitive optical surfaces, this may only be performed by trained service personnel.

### LASER RACK AND PC

The laser rack and the PC should be located next to or directly above one another if possible in order for the modules to be connected to one another with the cables provided.

When installing in a control cabinet or rack, ensure there is sufficient ventilation. Both the laser rack and the PC require a sufficient supply of air. The air should be sucked in from the front and blown out at the rear. When installing the laser rack, also ensure the minimum radius of curvature of the fiber optic cable (black tube) is not exceeded on the rear side.

### SOFTWARE INSTALLATION

The software will be installed by starting the SETUP.exe from the software-CD. Please follow the steps on the screen. The correct configurations files must be installed after the software setup is finished. The installation guide is enclosed in the accessory.

## 6.5 Electrical installation

Following the mechanical installation of the marking head, laser rack and PC, the components must be connected to one another electrically. (The laser rack and marking head are already connected to one another on delivery.) The peripherals (power supply, external control and safety signals, etc.) are then connected via the laser rack and PC interfaces.

All connectors are clearly identified in order to facilitate the electrical installation.

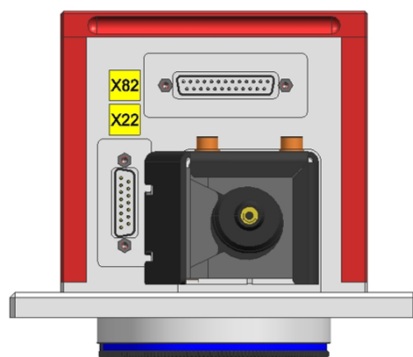
The connector denotations are also coded. The last digit of the connector denotation identifies the respective hardware components.

Therefore:

X ... 1 Laser rack

X ... 2 Marking head

### 6.5.1 Overview marking head interface (back side)



#### **Notice**

The cables are already connected to the marking head on delivery.



#### **Caution**

The fiber cable should only be disconnected from the marking head by trained service personnel.

Before working on the system, remove the power plug!

### 6.5.2 Overview laser rack interface (back side)



#### **Notice**

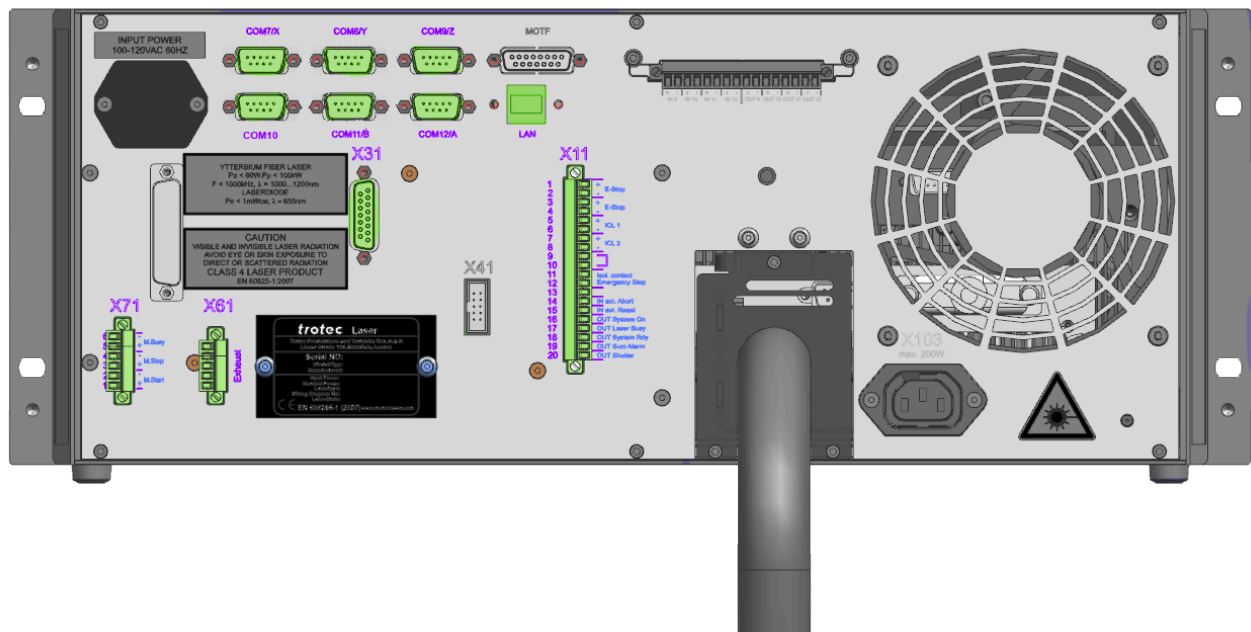
Before the laser marker can be put into operation, the external safety circuits and the external start and stop signals must be connected.



#### **Caution**

When making these connections, the operator must ensure that all safety circuits comply with the respective valid national standards and guidelines for the use of laser devices. Otherwise the device may cause personal injury or material damage.





The following connectors are available on the laser rack:

### X11 – Safety circuit (Emergency stop button / interlock safety switch / external messages)

The X11 connector enables the connection of external safety circuits, additional emergency stop circuits and external warning lamps.



#### Warning

The digital 24V inputs should only be controlled by isolated contacts with the 24V pin 13 on X11. The input of signals with any other reference potential could result in damage to the respective inputs.

### X31 – External panel

The connector X31 may be used to connect an external control panel such as that located on the front of the laser rack. If no external panel is connected, the supplied connector must be used with the bridging devices.

### X61 – Exhaust system

This connector is used to control, start and stop a Trotec extraction unit. Only use the original cable supplied.

### X71 – Start / Stop

The X71 connector may be used to send start and stop signals via an external controller or receive a signal from the laser. The pin configuration is provided in “Interface Pin Configurations”

“Busy” is a laser output which can be set as required using a script.

“Stop” is an external input used to interrupt all running laser programs immediately. It is not necessary to monitor these inputs in a script.

“Start” is an external input which may be monitored in the software in order to trigger a marking process. If the monitoring of the signal is not active within a script, the input will have no effect on the program sequence.

## Setup and installation

---

For the “Start” and “Stop” Signal external 24VDC are needed.

### **COM7/X**

Connection X-Axis

### **COM8/Y**

Connection Y-Axis

### **COM9/Z**

Connection Z-Axis

### **COM10**

Reserved

### **COM11/B**

Connection B-Axis

### **COM12/A**

Connection A-Axis

### **LAN**

Connection between PC and Laserrack



#### **Notice**

If no external emergency stop circuit is connected, the supplied connector must be used with the bridging devices. In this case, only the emergency stop button on the front of the laser rack is active. The precise pin configuration of the plug is provided in “Interface Pin Configurations”.



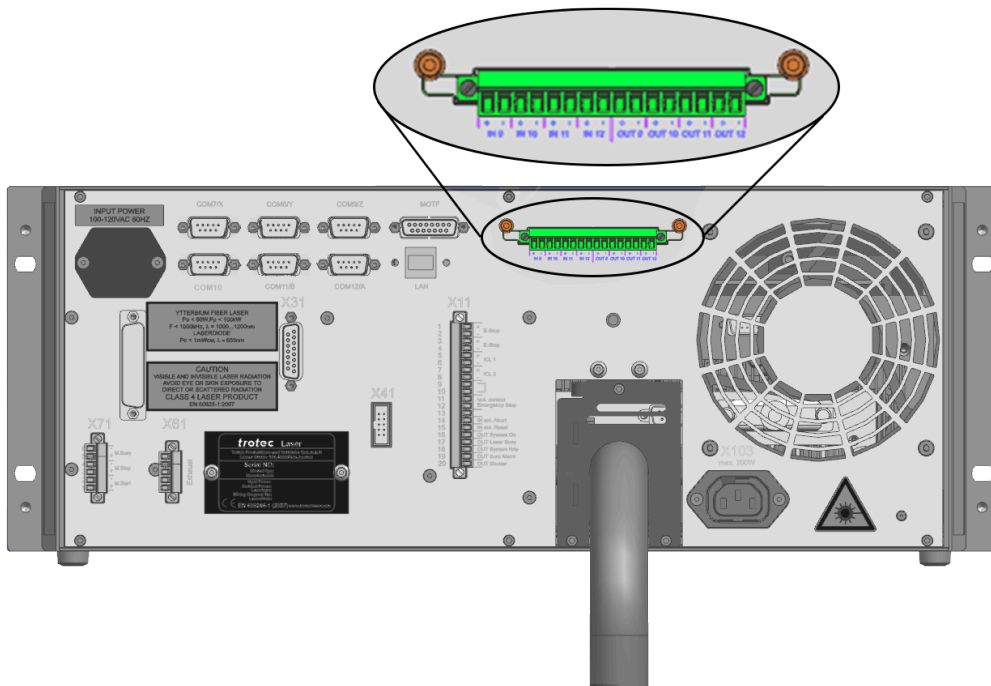
#### **Warning**

The maximum load of each of the digital 24V outputs on the interface is 100mA. A short circuit of the outputs must be avoided as it will damage the respective inputs.

The system is equipped with an additional Input/Output option.

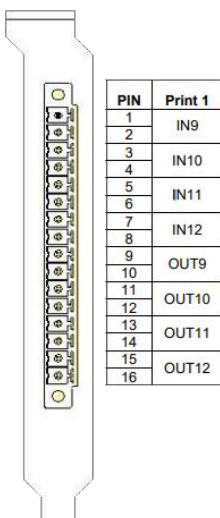
#### **With this option you can**

- feed the software with e.g. start, stop or status signals.
- activate signals by the software for e.g. warning lamps or relays.



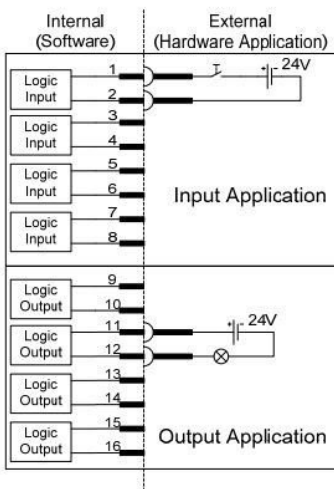
- The inputs have to be provided with a 5V - 24V potential.
- For “ON”, the first PIN (e.g. PIN1) has to be provided with 24V and the second PIN (e.g. PIN2) has to go to ground to ensure the potential.
- The software closes the contact to let the signal from the first PIN (e.g. PIN11) through to the second PIN (e.g. PIN12).
- The outputs sections provide potential free relays contacts.
- The addressing is done by the software. For details please refer to the software manual.

**SPECIFICATION:**



- Maximum number of input signals: 1 per print
- Maximum voltage on output: 24V AC or DC
- Maximum current on each output: 1A

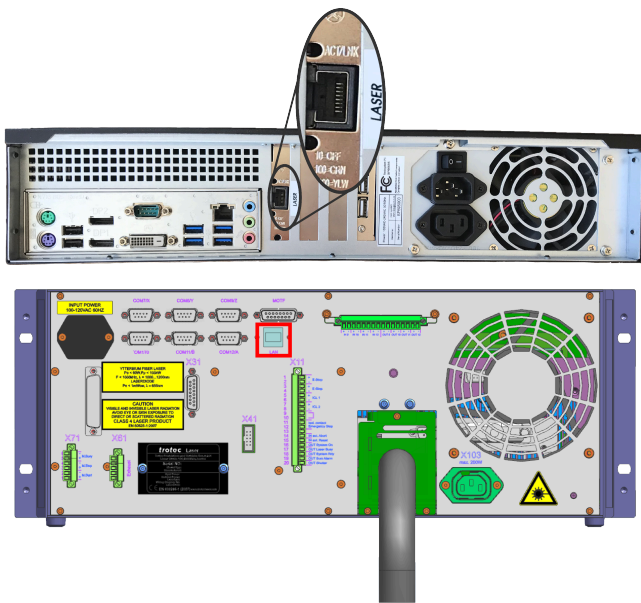
**APPLICATION EXAMPLES**



Input with switch and external 24V source at input "IN9".

Supply of a lamp with 24V by activating "OUT10".

**6.5.3 Overview PC interface (back side)**



The machine is connected to the Ethernet via a cable connection from the LAN interface on the rear of the PC rack to the LAN interface on the laser rack.

**THE FOLLOWING IP ADDRESSES ARE RESERVED:**

192.168.0.3	192.168.0.10	192.168.0.13	192.168.0.16	192.168.0.19
192.168.0.5	192.168.0.11	192.168.0.14	192.168.0.17	192.168.0.50
192.168.0.7	192.168.0.12	192.168.0.15	192.168.0.18	

### 6.5.4 Mains connection

Laser rack and PC have a cold device socket on the rear for the cold device cables supplied.

Before commissioning, it is essential to check whether the laser rack is configured to the mains voltage and frequency.

The configuration of the laser rack is given on the type plate or on the warning label above the IEC connector.



#### Warning Dangerous electrical voltage

The laser rack is fitted with different main fuses depending on the configured supply voltage:

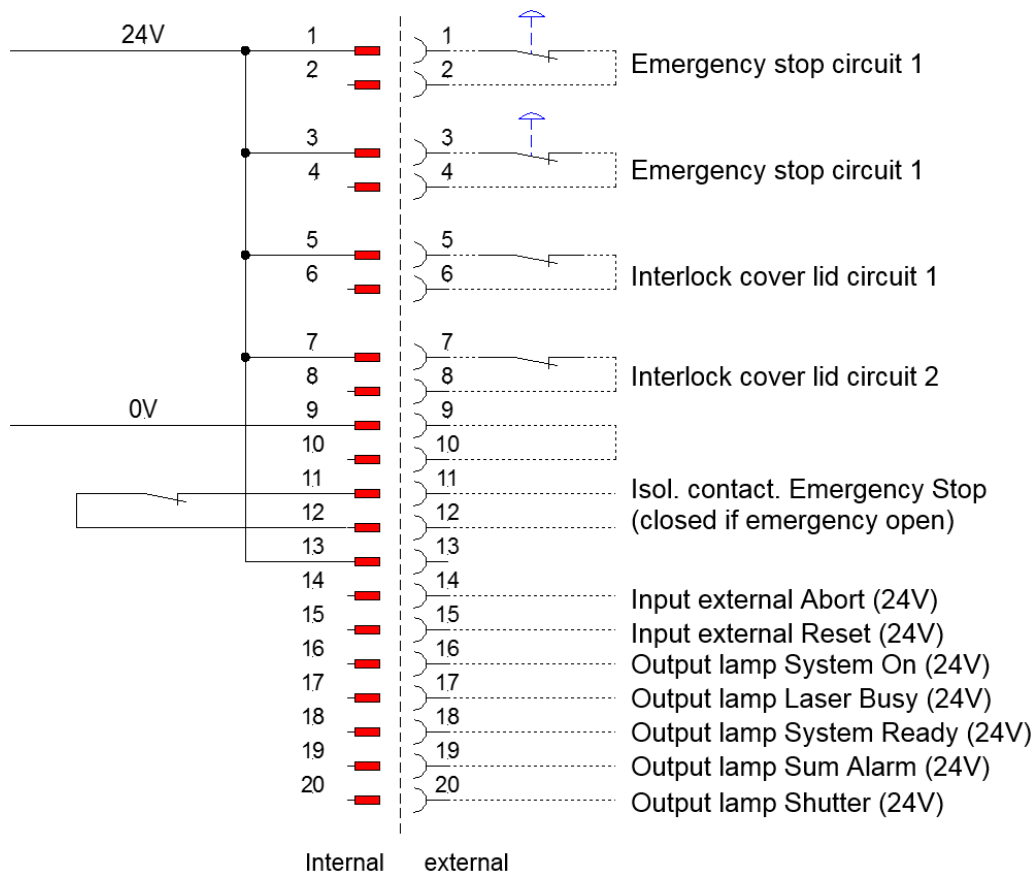
115V AC	-	1 x 6.3 A "T" speed/time-delay
230V AC	-	2 x 4 A "T" speed/time-delay

The main fuses are located behind the cover, immediately adjacent to the IEC connector.

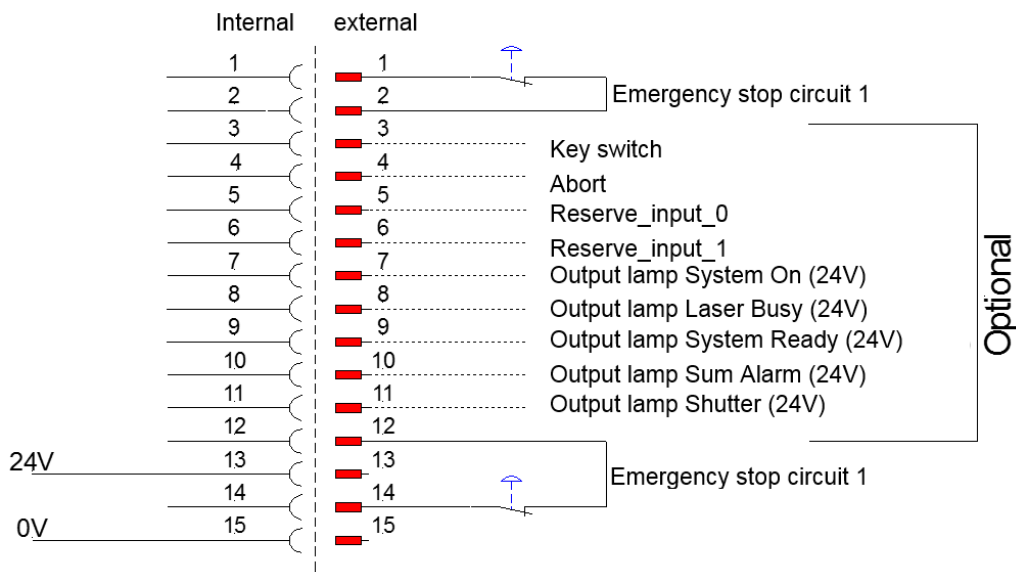
The same main fuse is used on the PC for all mains voltages.

### 6.5.5 Interface pin configuration

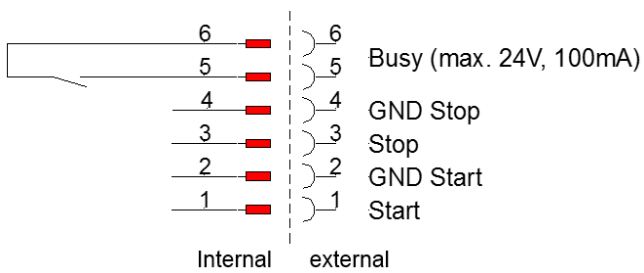
#### X11 – Safety circuit (Emergency stop button / interlock safety switch / external messages)



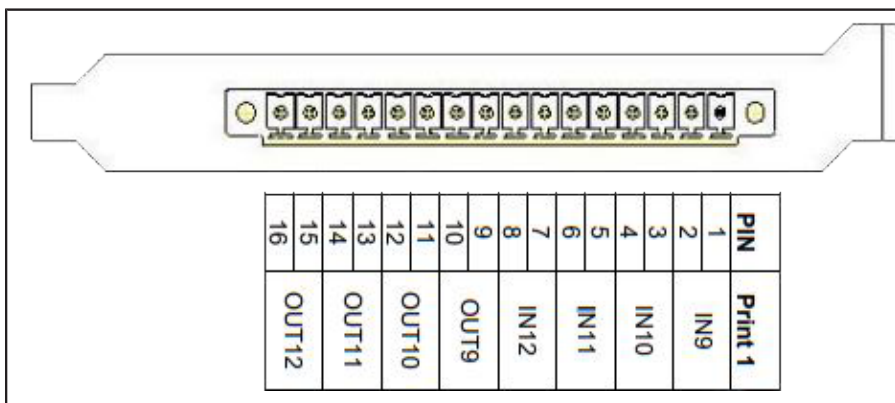
#### X31 - External panel



## X71 - Start / Stopp



## I/O Input/Output

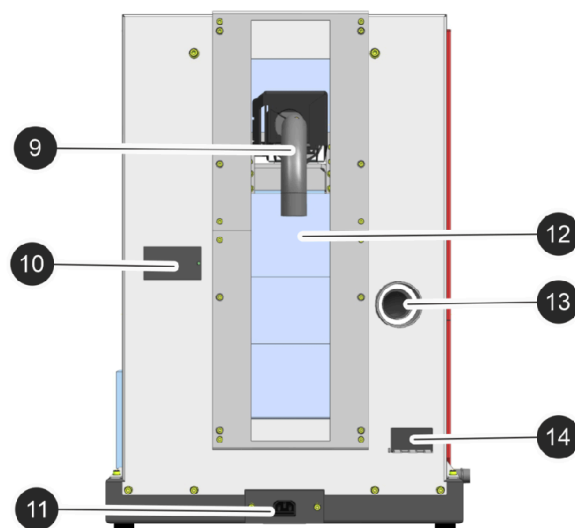


## 7 Machine overview

Front view



Back view



1	Safety door incl. laser protection glass	8	Keypad
2	Protective door handle	9	Marking head backside
3	Exhaust	10	Type plate
4	Emergency stop button	11	IEC connector for z-axis
5	Marking head	12	Laser safety protection elements
6	z-axis	13	Exhaust connection
7	T-slot table	14	Cable opening

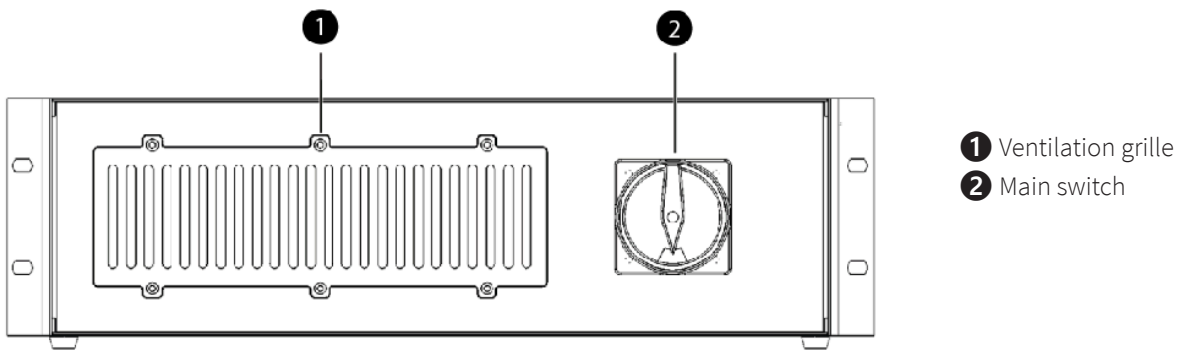
### 7.1 Control elements

**The electrical and electronic controls are housed in three 19" racks:**

- System control
- Laser control
- Industrial PC

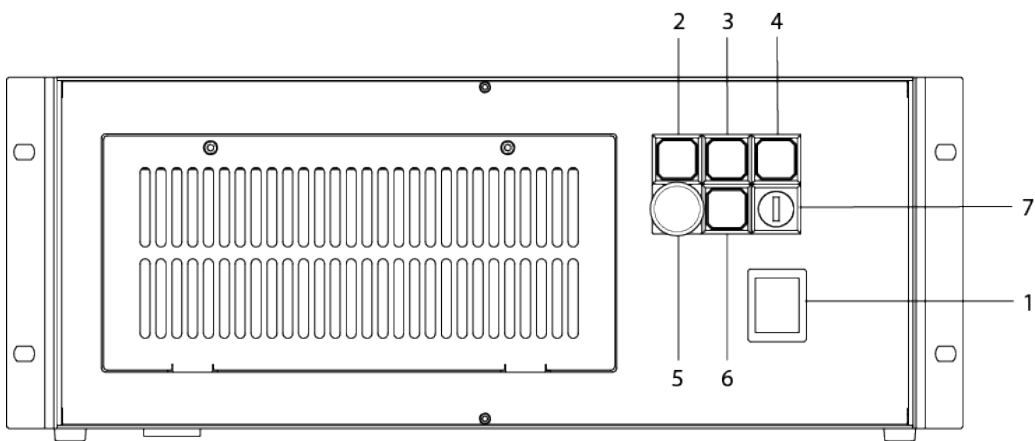
#### 7.1.1 System control

The system control takes over the control of the safety gate, the automatic sequence and the safety.



## 7.2 Laser rack

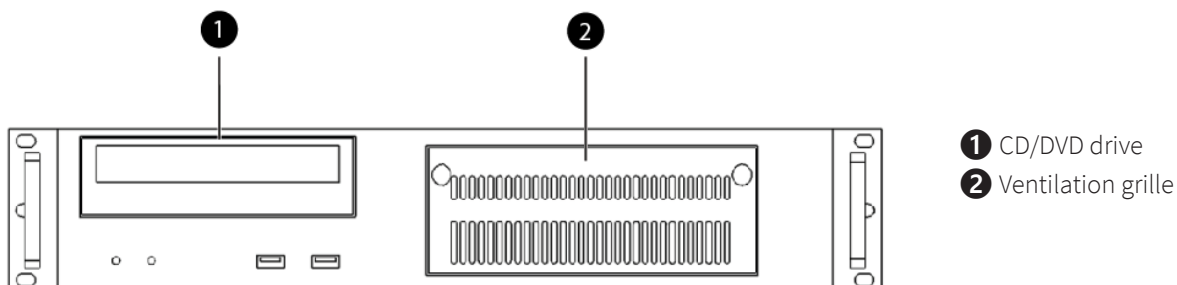
### LASER RACK



Number	Description	Types
1	Main switch	toggle switch
2	System ready	control lamp
3	Shutter	control lamp
4	Laser busy	control lamp
5	Emergency stop button	switch
6	Error reset	button
7	Key switch	switch



### 7.3 Industrial PC



- ❶ CD/DVD drive
- ❷ Ventilation grille

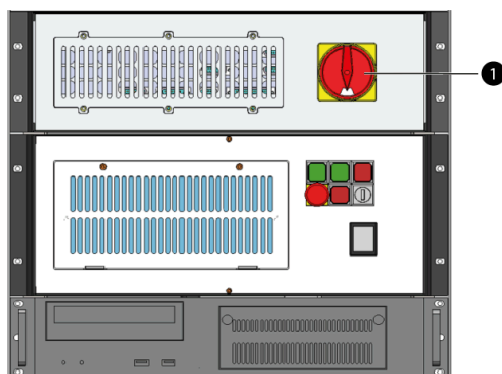
### 7.4 Safety devices

#### MAIN SWITCH

##### Base cover on the right:

- When the main switch is operated, the entire system is de-energized.
- Laser is off.

##### ❶ Main switch



#### EMERGENCY STOP BUTTON

1. On the front.
2. On the laser rack.

Task of the emergency stop device:

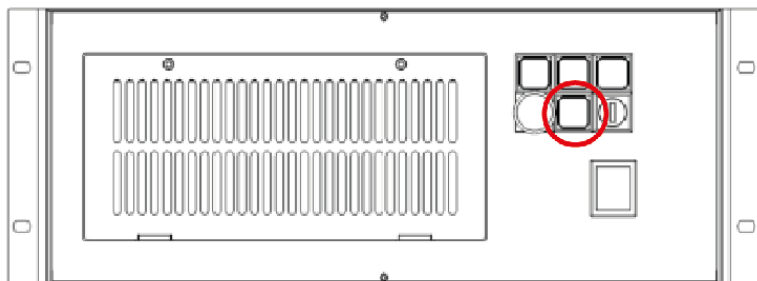
First priority: prevention of danger to operating personnel.

Second priority: prevention of damage or destruction of machine or material.

- Immediately switch off the circuit.
- Laser beam is interrupted by the shutter.

- All movements are stopped.
- The triggering of the emergency stop function is indicated by a fault message.

### EMERGENCY STOP ACKNOWLEDGMENT - SEQUENCE



Press the error reset button on the laser rack.

### SAFETY SWITCH ON THE SAFETY DOOR

#### Observation window:

The observation window in the front door is made of a laser protection filter according to DIN EN 201, which is made of a special material that is adapted to the laser type and absorbs the laser radiation. If the window is damaged, it must be replaced.

#### Safety shutter in the laser:

If a safety circuit in the laser system is open, the safety shutter in the laser closes immediately. For safety reasons, this shutdown follows via safe components. This interruption in the laser is mechanical. An error message is output.

#### Cladding panels

Cover plates protect from laser light.



#### Warning Laser

All protection plates must be mounted all times.

## 8 Operation

### 8.1 Installation inspection

The following points must be checked to ensure correct installation:

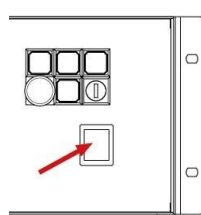
- Correct power supply connections and fuses.
- Complete and correct mechanical and electrical installation.
- Check that the mechanical and electrical installation is complete and correct Input voltages.
- Checking the purity of the optical components (free of dust and dirt).
- Remove the protective cover from the focusing lens.
- Check the environmental conditions against the technical specification.
- Observe laser safety regulations.
- Check compliance with all laser safety measures. The system may only be switched on if all precautions have been taken to comply with the laser safety have been checked. by an authorized person and found to comply with the standards.

### 8.2 Marking software

The marking software is included on the accompanying software CD.

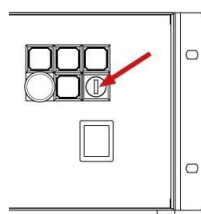
For information on using the software, please read the accompanying software manual.

### 8.3 Power On/Off

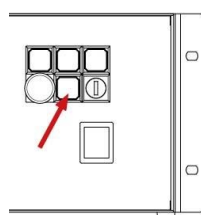


1. Press the main switch (1) on the laser rack.

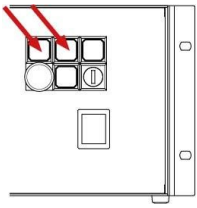
→ The shutter is closed. The main switch and the two status lamps on the marking head illuminate in yellow.



2. Put the key in the key switch (7) (vertically) and turn 90° to the right.



3. Press the Error reset button (6) to reset the system to its normal state.



4. The control lamps “System ready” (2) and “Shutter” (3) such as the status lamps on the marking head should now be illuminated. The laser is ready to start marking.



5. Start the PC.

6. Now start the marking software on the PC.

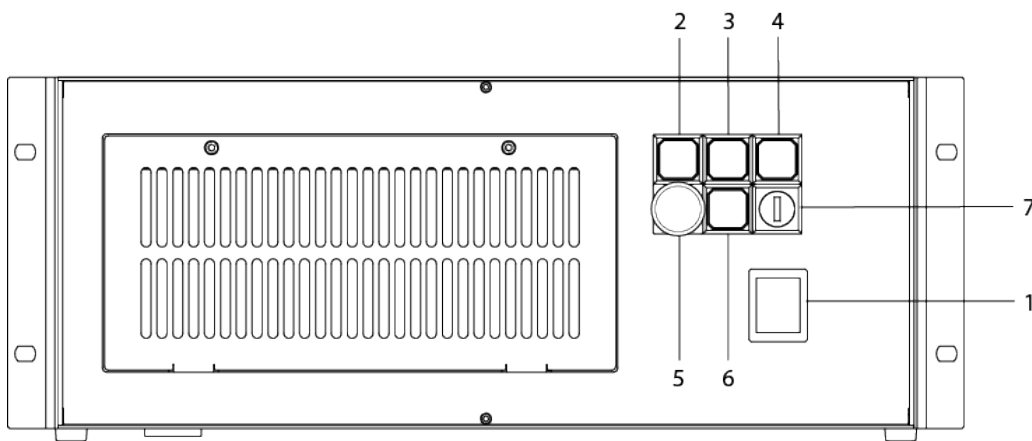
If an error occurs, the control lamp “Error reset” (6) lights up. By pressing this button, the error can be acknowledged and the system is ready to work again.

You can use only the key switch (7) to pause the laser.

The main switch (1) must be set to O to switch off the laser completely.

## 8.4 Control panel laser rack

### LASER RACK



Number	Description	Types
1	Main switch	toggle switch
2	System ready	control lamp
3	Shutter	control lamp
4	Laser busy	control lamp
5	Emergency stop button	switch
6	Error reset	button

Number	Description	Types
7	Key switch	switch

## 8.5 Keypad control

The keypad is located in the lower right corner of the machine.



1	Up-button z-axis
2	Down-button z-axis
3	Laser active*
4	Light switch
5	Start-button**

\*LED: The machine is processing data.

\*\* The function must be activated in the software.

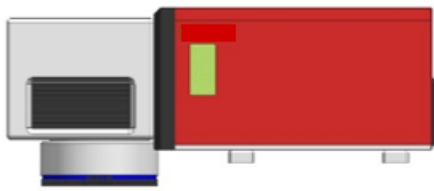
### 8.6 Emission indicator

The laser system is equipped with an emission indicator.

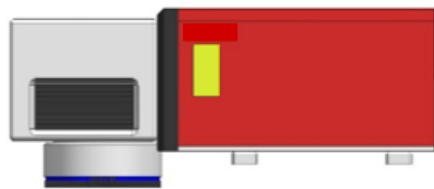
This is indicated by a separate display on the marking head and/or by a luminous control lamp (shutter) on the laser rack.

#### MEANING OF THE SIGNAL COLORS

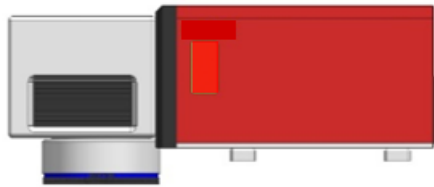
---



**Emission indicator off** - Device de-energised.



**Emission indicator status yellow** - shutter is closed, no laser power output.



**Emission indicator status red** - shutter is open, output of laser power possible.



#### Warning Laser

If the device is switched on or the safety shutter is open there is a danger of laser radiation.

- Pay attention to the emission display.
  - Do not open laser marking head.
- 

### 8.7 Focusing

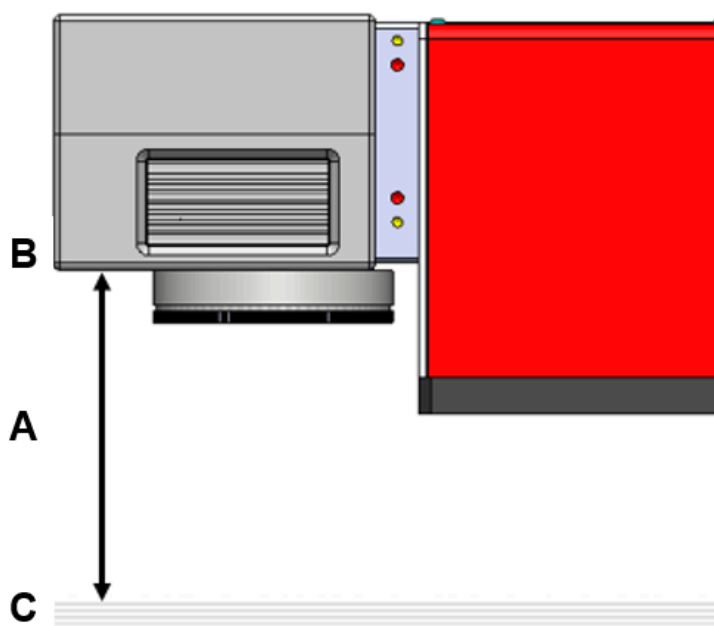


#### Notice

It is absolutely essential to maintain the correct focal distance for every laser marking process. Only when in focus will the laser beam achieve the power density necessary for permanent and clearly legible marking.

Prior to any marking it is therefore necessary to set the correct focal distance between the marking head and the workpiece. An incorrect focal distance is the most common cause of poor or even indistinguishable markings.

The focal distance **(A)** is measured between the lower edge of the working galvo head **(B)** and the upper surface of the workpiece **(C)**. The correct focal distance depends on the lens used (focal length).



Focal length	Working distance (A)
F=100	134,6 mm
F=160	211,6 mm
F=254	361,6 mm

## 8.8 Options

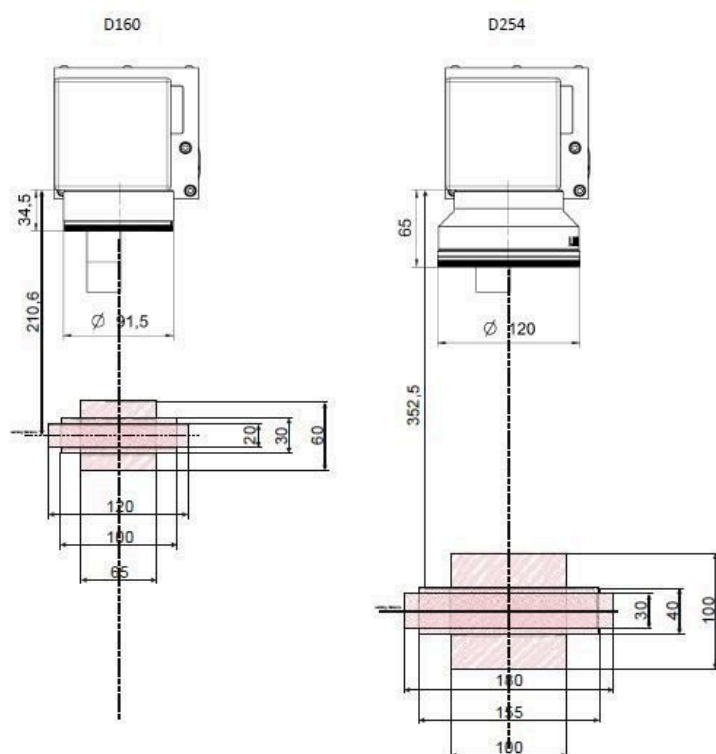
### 8.8.1 SpeedMarker “DS” Dynamic Shifting

The SpeedMarker DS enables very fast and precise focusing without mechanical movement of the marking head. The optical z-axis built in for this purpose is controlled via the software using the “Focus Shift” function.

The SpeedMarker DS is available in the “D160” and “D254” versions.

The working fields of the SpeedMarker DS result depending on the maximum desired z-stroke.

## WORK VOLUME



### Information

Further and detailed information on the use of the functions can be found in the software manual.

### 8.8.2 3D-Projection/Virtual Rotary

In addition to the Focus Shift function, it is possible to activate the “3D-Projection” option for xyz-axis systems by means of a license key. This allows various 3D shapes to be labeled flexibly and easily.

### 8.8.3 SpeedMark Vision - Smart Adjust

The Smart Adjust option is an integrated camera system for user-friendly and highly precise positioning of markings directly on the component by superimposing a camera image on the operator interface.



### Information

For further information, please refer to the appendix “Datasheet Smart Adjust” or the manual “SpeedMark Vision Smart Adjust”.

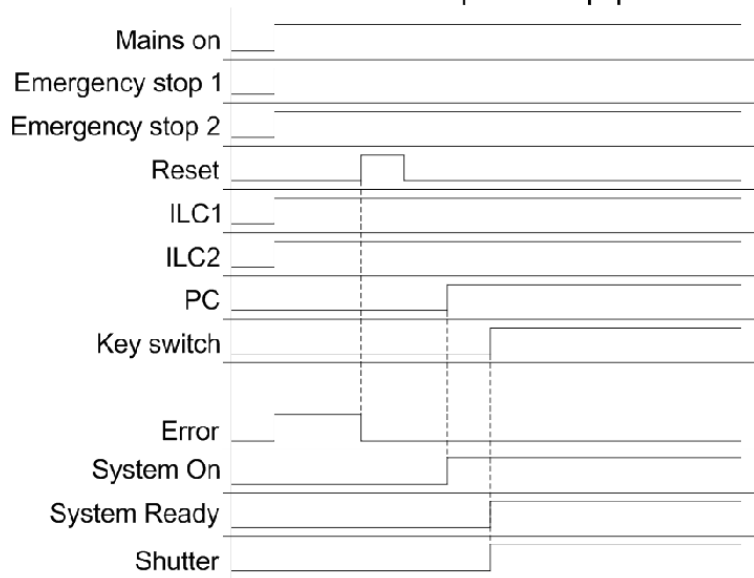


## 9 Ingetration / Connection

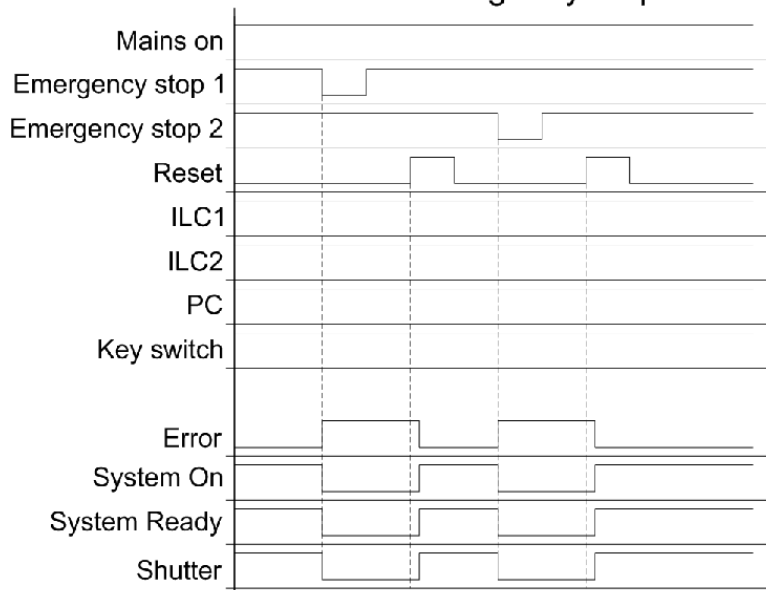
### 9.1 Switching sequences

Switching sequence diagrams are provided for various standard processes which indicate the interplay of the individual signals.

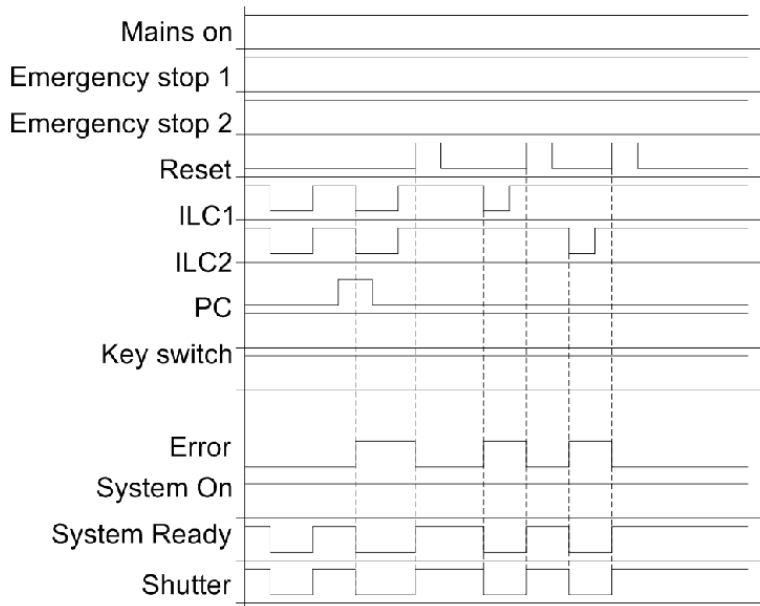
**Standard power-up process**



**Emergency stop**



### ICL (interlock circuit loop)



## 10 Maintenance

### 10.1 Safety notes



#### Caution

Before any maintenance work takes place, ensure that the power supply has been switched off and the system is de-energised.



#### Notice

All maintenance work must be carried out according to the safety regulations.

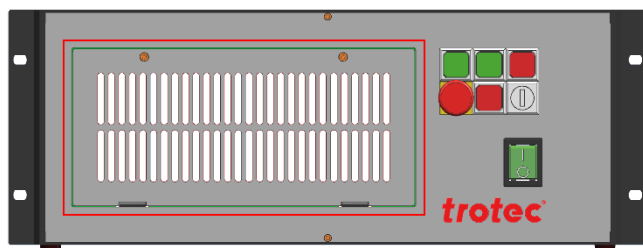
In order to ensure the maximum availability and lifetime of the system, we recommend you regularly check the filter system and ventilation and keep the surrounding area clean. Before switching on the system, make a visual inspection of the lenses.

### 10.2 Changing of the laser source filter mat

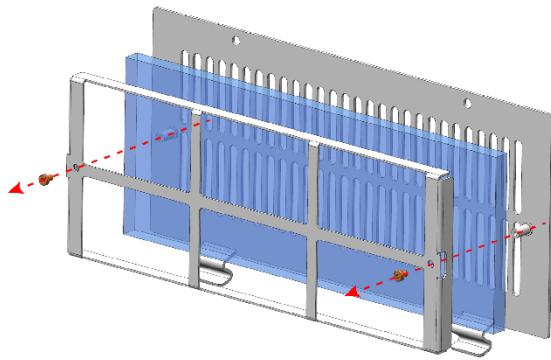
This laser system is equipped with air cooling. A filter mat is used to protect the electronic components from dust and impurities in the ambient air. This filter mat should be checked and replaced at regular intervals to ensure an optimal cooling situation.

The filter pad is located behind the ventilation slots on the front of the laser rack or on the Pc.

Filter pad on the laser rack:



1. Cover of the filter pad.



2. Remove both screws and open the cover. Change the filter pad.

### 10.3 Cleaning the optics

This system is fitted with high quality optical components, which under normal operating conditions are maintenance free for their lifetime. However, it may be necessary to clean output lenses, e.g. the scanner flat field lens (f-theta objective) if it becomes covered in dust or fumes.



#### Notice

Never touch the optical components with your fingers! Oily or dirty hands may damage the lens surfaces.

Do not use any tools or hard objects to clean the surfaces. Scratches cannot be repaired.

Laser optics are highly sensitive and their surfaces are not as hard as traditional glass. They can also be easily damaged by cleaning. It is therefore necessary to ensure that any dirt is removed using a suitable suction device and that the surrounding area is cleaned regularly.

Small bellows should be used to remove dust.



#### Notice

Do not use compressed air as it contains small quantities of oil and water.

To remove larger pieces of dirt, only use a lens cleaning cloth with high proof (at least 98%) alcohol.



#### Notice

Do not dip the cleaning cloth in the cleaning solution. This contaminates the solution and makes it unusable. Place drops of the solution on the cloth!

Apply the cleaning solution carefully in order to avoid scratching the surface of the lens.

Do not wipe the lens with a dry cloth. Do not touch the reverse side of the cloth. Dirt and sebum on the fingers can be transferred to the lens by the cloth and cause damage.

Distribute the cleaning fluid carefully using small circular motions. Start at the center of the lens and move outwards to the edge. Keep moving the cloth until the entire surface is clean.

Do not exert any pressure on the lens.

## 11 Troubleshooting

This chapter should assist maintenance personnel with the identification and resolution of operational faults based on error messages and symptoms.



### Danger

Maintenance and repair work should only be carried out by Trotec Laser GmbH or one of its authorized personnel under observation of the safety regulations.

### 11.1 Error, cause and remedy

Problem	Possible cause	Remedy
<b>Error message on loading the program.</b>	Plug or cable installed incorrectly.	Check the plug and cable are installed correctly.
	Laser power supply switched off.	Turn on main switch.
	Software not installed correctly.	Re-install software.
<b>Laser will not switch on.</b>	Software terminated irregularly.	Restart computer.
	Plug or cable installed incorrectly.	Check the plug and cable are installed correctly.
	Laser power supply switched off.	Turn on main switch.
<b>Status lamps on marking head remain green.</b>	Faulty fuse in laser power supply.	Replace fuse.
	safety circuit not closed.	Check safety circuit If no safety circuit is connected, use bridging connector X11.
<b>No laser beam.</b>	Check working distance.	
	Laser not in focus.	Check working distance.
	Shutter closed.	Open shutter - if not possible check safety circuit.
<b>Insufficient laser output.</b>	Incorrect laser parameters.	Check the parameters in the program. Use suitable parameters for the material and application.
	Laser not in focus.	Check working distance.
	Incorrect laser parameters.	Check the parameters in the program. Use suitable parameters for the material and application.
<b>Missing symbols.</b>	Focusing lens dirty.	Clean focusing lens.
	Surface of the material dirty.	Clean material surface.
<b>Other faults.</b>		Contact Technical Support.

### 11.2 Possible error messages

Below is a list of possible errors which may be detected by the system. These will appear in the software as messages on the display.

The Reset signal (X11) or the reset button on the laser rack are used to acknowledge an error. In order for the system to be reset, the error or the corresponding input signal must be acknowledged.



#### Warning

System errors which cannot be reset or which indicate a hardware error should only be resolved by Trotec Laser GmbH trained service personnel.

Error message	Cause
Card off line.	Software has lost connection to the TLC2 controller
Scanner not connected.	No connection to the galvanometer scanner.
Scanner X error.	The X-axis of the galvanometer scanner has identified an error.
Scanner Y error.	The Y-axis of the galvanometer scanner has identified an error.
Signal cable not connected.	No connection to the marking head.
External abort.	External abort signal identified on X11.
External stop.	External stop signal identified on X11.
Voltage error (15V).	+/- 15V power supply not functioning correctly.
Voltage error (24V).	24V power supply not functioning correctly.
Laser power supply error.	Faulty laser source power supply.
Shutter error.	Shutter has not reached intended position.
Cover connector opened during marking.	ICL1 and ICL2 were opened during the marking process .
External sum alarm.	External error signal identified on X11.
System locked by key switch.	Key switch on laser rack locked.
Laser temperature.	Laser source overheated.
Laser power.	24 V power supply outside the permissible tolerance zone.
Laser not ready for emission.	e.g. key switch not activated.
Laser back reflection.	Back reflection of the laser beam.
Laser system error.	Laser power supply voltage is too high or too low.
Emergency stop button.	Emergency stop button activated.
Error.	+/-15V monitoring.
	24V laser monitoring.
	24V monitoring.
	Shutter temperature.

Error message	Cause
	Required shutter position.

### 12 Contact details

#### **TECHNICAL SUPPORT**

In case of questions, contact our experienced Technical Support in your local area.

For global service contact numbers and further information please see our website, section "Support":

**[www.troteclaser.com](http://www.troteclaser.com)**

When calling, please make sure that the machine is in your immediate vicinity, and that you have the following information ready (see response form):

- At which working process did the problem occur?
- What you have done so far to correct the problem.
- Serial no (see type plate).
- Error code.

#### **LOCAL OFFICES / SALES**

Our store locator and detailed information on our offices in your area can be found on our website in section "Contact", "Local Office": **[www.troteclaser.com](http://www.troteclaser.com)**

#### **TECHNICAL DOCUMENTATION**

For feedback or to suggest changes to this manual, contact:

Technical documentation: +43 (0) 7242 239 - 7000

E-Mail: **[technical.documentation@troteclaser.com](mailto:technical.documentation@troteclaser.com)**



## 13 Disassembly



### Warning

#### Danger of injury when disassembling the machine.

There is danger of injury when disassembling the machine.

Always wear suitable protective clothing (e.g. safety goggles, safety shoes, safety gloves).



### Warning Dangerous electrical voltage

#### Electric current.

The machine must be disconnected from the main power supply.



### Notice

- Always use suitable tools to disassemble the machine.
- Mind the springs.
- Follow chapter "Disposal".

### PROCESS:

1. Remove all workpieces from the system.
2. Turn the key switch to switch off the machine.
3. Switch off the main switch at the back of the machine.
4. Remove the exhaust system.
5. Disconnect all cables at the back of the machine.

### 14 Disposal



#### **Disposal**

##### **Do not dispose of the machine with domestic waste!**

Electronic devices have to be disposed of according to the regional directives on electronic and electric waste disposal.

In case of further questions, please ask your supplier.

In case of disassembly, use suitable tools to dismantle the unit into individual parts. Sort the individual parts and have them disposed of professionally. Legal regulations must be adhered to.

15 Appendix

# EC-Declaration of Conformity

According to Machine Directive 2006/42/EC, Annex II 1. A

# trotec

## Manufacturer:

Trotec Laser GmbH  
Freilinger Straße 99  
4614 Marchtrenk  
Austria

## Authorized person to compile the technical files:

Trotec Laser GmbH  
Freilinger Straße 99  
4614 Marchtrenk  
Austria

## Description and Identification of the machine:

Product description	Laser engraving system
Model name	SpeedMarker 300 , SpeedMarker 300 DS
Serial number	S03#-#### , D03#-####
Machine group	8025, 8037
Function	System for laser engraving

## It is declared expressly that the machine fulfills all of the following applicable EC directives and regulations:

2006/42/EC	EC Machine Directive 2006/42/EC
2014/30/EU	Directive 2014/30/EU Electromagnetic Compatibility

## Reference to the harmonized standards in accordance with article 7 (2):

ISO 11553-1:2020	Safety of machinery – Laser processing machines Part 1: General safety requirements
ISO 12100:2010	Safety of machinery – General principles for design - Risk assessment and risk reduction
ISO 13849-1:2018	Safety of machinery – Safety related parts of control systems Part 1: General principles for design
IEC 60204-1:2018	Safety of machinery – Electrical equipment of machines Part 1: General requirements
IEC 60825-1:2022	Safety of laser products - Part 1: Equipment classification and requirements
IEC 61000-6-2:2019	Electromagnetic compatibility - Part 6-2: Immunity standard for industrial environments

## Further Reference to the harmonized standards in accordance with article 7 (2):

IEC 60825-4:2012	Safety of laser products - Part 4: Laser guards
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Marchtrenk, 08 January 2023

City, Date

  
Trotec Laser GmbH  
Freilinger Straße 99, A-4614 Marchtrenk  
+43 7242 239-0  
www.troteclaser.com

pp. Hagen Strasser  
Head of Research and Development

## SpeedMarker 300 (8037)



### Laser

Wavelength	1.064 nm
Laser source	Pulsed Yb-fiberlaser
Power stability	better $\pm 5\%$
Cooling	active fan cooled

Laser type	20W Fiber	20W MOPA	30W Fiber	50W Fiber	100W MOPA
Maximum laser power	20W	20W	30W	50W	100W
Pulse frequency (kHz)	1-600	1-4000	1-600	2-200	1-4000
Pulse length(ns)	200	2-500	200	200	2-500
Beam quality	$M^2 < 1.5$	$M^2 < 1.4$	$M^2 < 1.8$	$M^2 < 1.4$	$M^2 < 1.6$
Maximum pulse energy [mJ]	0.8	0.8	0.8	1.25	1.5

### Laser marker with software-controlled Z-axis

Lens	F100	F160	F210	F254
Maximum part height (mm)	229	168	111	61
Marking field XxY(mm)	70x70	120x120	150x150	190x190
Spotdiameter @ working dist.(mm)	0.027	0.045	0.059	0.068
Marking resolution (mm)	0.001	0.002	0.002	0.003
Max. marking speed (m/sec)	7	12	12	12
Maximum load	50 kg			
Working table	T-slot plate (Isel PT 25): 350 x 400 mm <sup>2</sup>			
Weight approx.	56 kg			

### System specification

Norm	CDRH Lasersafety; Laserclass 2 CE [EN 60825-1] (with pass through option: CDRH Lasersafety; Laserclass 4 with EC- Declaration of Incorporation According to Machine Directive 2006/42/EC, Annex II 1. B)
Software	Speedmark; Directmark Printerdriver
Supported mono fonts	ISOCT, RomanS,SOKOL
Supported fonts	all installed TrueTypeFonts
Supported 1D barcodes	Australian Post; Codebar; Code 11; Code 128; Code 39; Code 93; DAFT; Deutsche Post; DPD; EAN-13; EAN-14; EAN-8; GS1; HIBC; ISBN; GS1; Pharmacode
Supported 2D codes	Datamatrix; QR-Code; Aztec; Codeblock-F; GS1 Databar; HIBC; Maxi Code; PDF 417
Supported image formats	BMP; JPG; DXF; PDF; EPS; PS; TSF; DWG
Laser source	Pulsed Yb-fiberlaser
Focus and pilot laser	Diode laser $\lambda = 655\text{nm}$ , Laser class 2; 1mW
Cooling	passiv air cooled
Cable length to rack	~ 2,5m
Protection level	IP 54
Dimensions [W x H x D (mm)]	445 x 938 x 851
Weight including lense	65kg

## Laser Rack

Interfaces	Ethernet, RS232, Laser-Interlock, Marking-Start (24 VDC), Marking-Stop (24 VDC), E-Stop, Error-Reset, Laser-Busy, assignable digital I/O's (4/4;24 VDC),
Weight	20kg (100W 25 kg)
Dimensions LxBxH	449x619x177
Power supply	115 - 230V AC, 50/60Hz, 1/N/PE
Maximum power consumption	Max. 500W
Cooling	active fan cooled
Protection level	IP 20
Mini. required exhaust	Atmos Nano

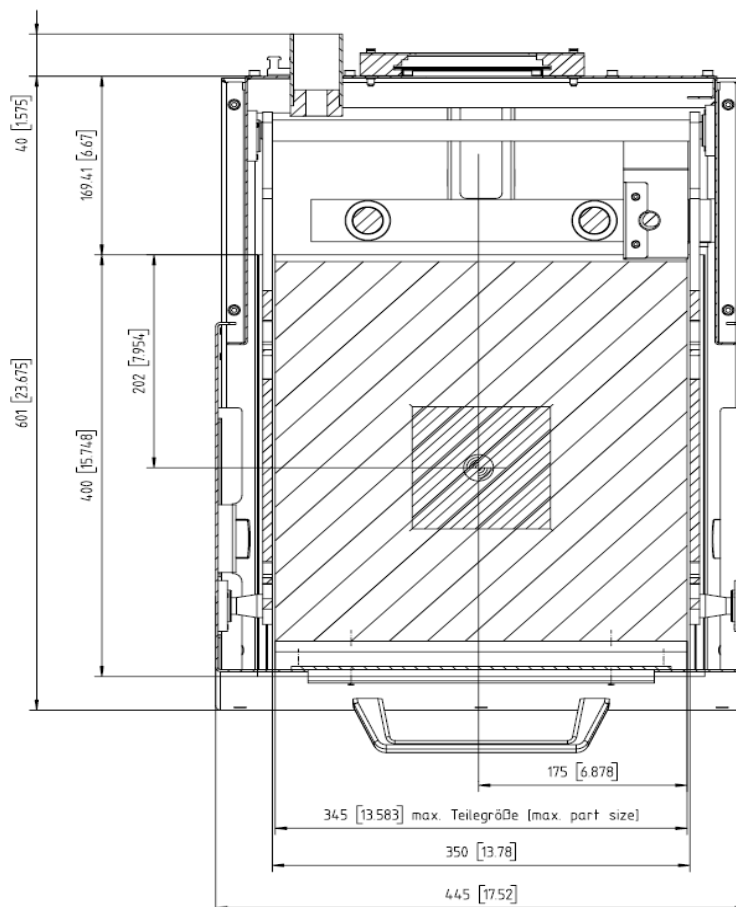
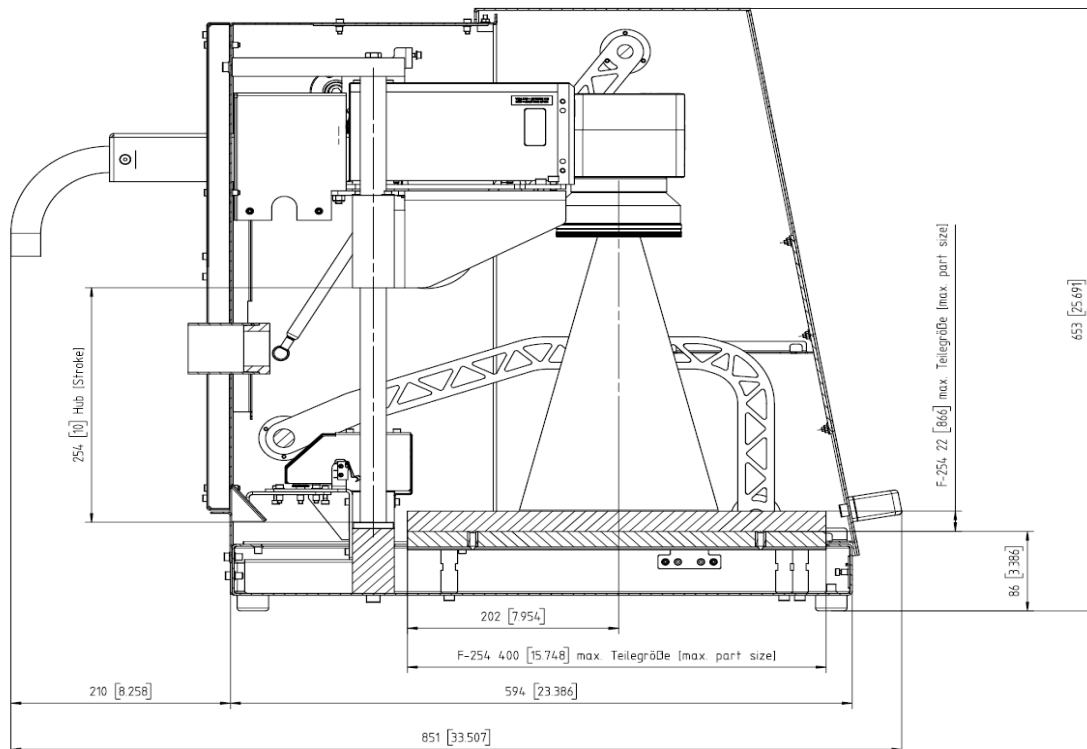
## Laser Controller IPC

Weight	9 KG
Dimensions LxBxH	428x400x88.5
Power supply	115 - 230V AC, 50/60Hz, 1/N/PE
Maximum power consumption	Max. 500W
Cooling	active fan cooled
Protection level	IP 20

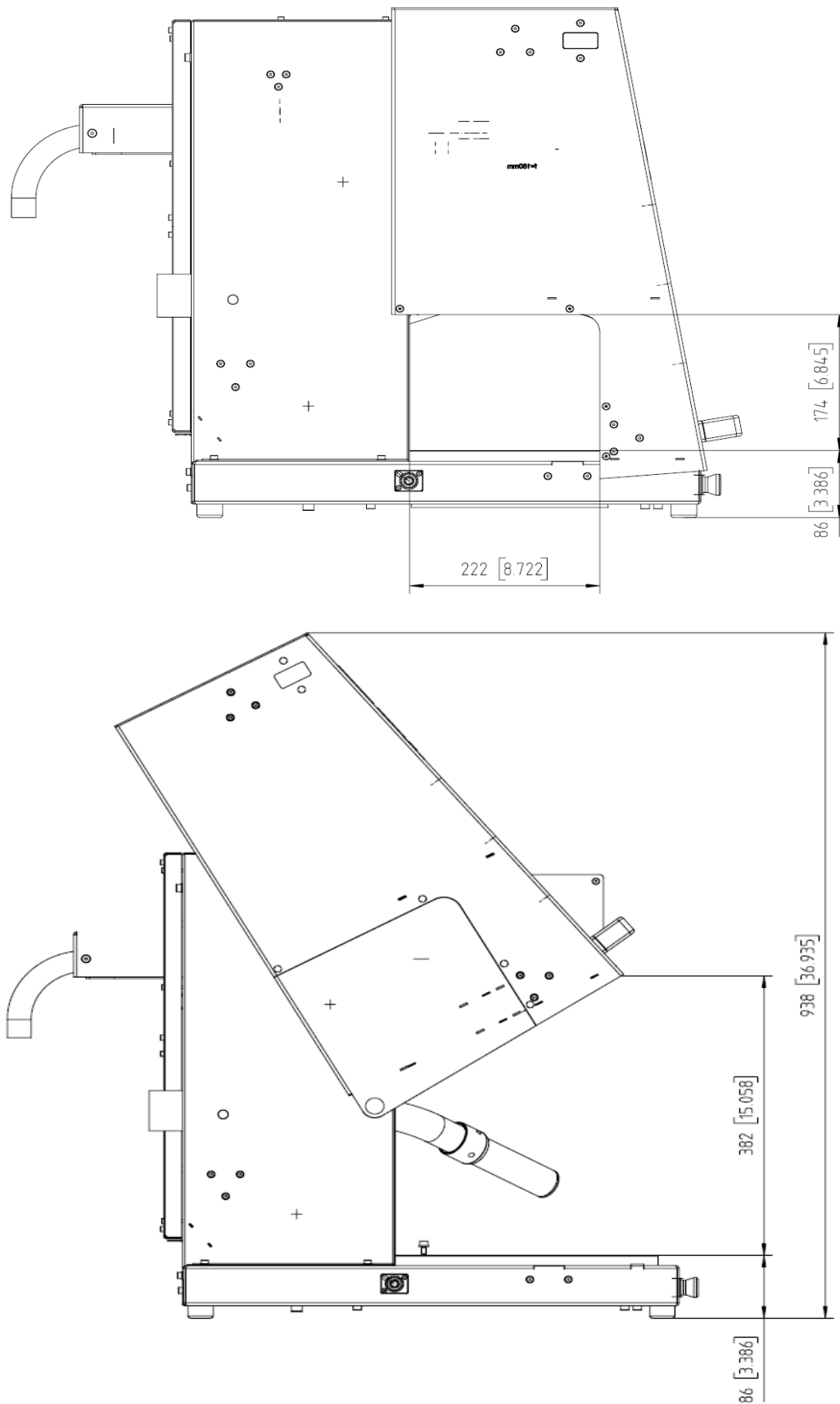
## Ambient conditions

Operation	Temperature range +15 to +35° C; Relative humidity max. 60 %. Non-condensing
Storage	Temperature range +0 to +30° C; Relative humidity max. 60 %. Non-condensing
Transport	Temperature range -10 to +40° C; Relative humidity max. 70 %. Non-condensing

## SpeedMarker 300



## SpeedMarker 300 - Pass Through Option



Tolerances on Dimensions: 1%  
Content subject to change without prior notice.

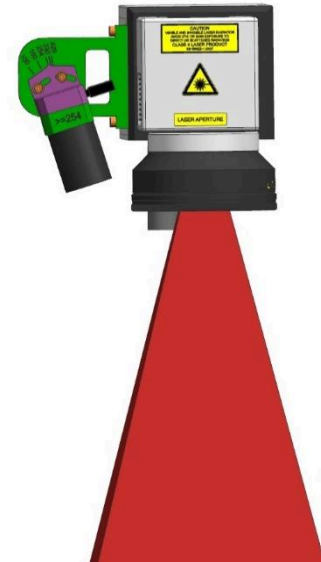
v2.0 04/04/2023



→ **SpeedMark Vision - Smart Adjust  
Technical Datasheet**



→ **SpeedMark Vision – Smart Adjust**  
Integrated camera system for user friendly and precise positioning of markings directly on the product. Camera image is shown directly in the GUI of the laser software



**Camera und Lens**

Sensor type	CMOS
Interface	USB 2.0
Optical class	1/2 "
Resolution class	10,55 MPixel
Camera resolution	3840 x 2748 Pixel
Pixel size	1.67 µm
Lens type	C-Mount
Focal length of camera lens	f = 8,5 mm; 12 mm; 25 mm

**Compatibility / Accessories**

Available for following products	SpeedMarker 300, 700, 1300, FL (OEM)
Software	SpeedMark 3.6
Camera package without lens	Material number: 98778 (Retrofit kit: 98781)
Lenses	<ul style="list-style-type: none"> <li>• f = 8,5 mm: Material number: 98777</li> <li>• <b>f = 12 mm: Material number: 92385 (default)</b></li> <li>• f = 25 mm: Material number: 92386 (precision)</li> </ul>



**Size of camera image (depending on lens)**

F-Theta lens laser	F-100	F-160	F-254	F-330	F-420
Marking field laser [mm]	70 x 70	120 x 120	190 x 190	240 x 240	310 x 310
8,5 mm lens [mm]	~ 140 x 100	~ 188 x 135	~ 290 x 208	~ 317 x 247	~ 432 x 309
<b>12 mm lens [mm] (default)</b>	<b>~ 87 x 62</b>	<b>~ 116 x 73</b>	<b>~ 187 x 134</b>	<b>~ 218 x 160</b>	<b>~ 257 x 195</b>
25 mm lens [mm] (precision)	~ 34 x 24	~ 50 x 37	~ 90 x 65	~ 113 x 80	~ 138 x 100

**Resolution depending on camera lens**

F-Theta lens laser	F-100	F-160	F-254	F-330	F-420
8,5 mm lens	27 Pixel/mm	20 Pixel/mm	13 Pixel/mm	11 Pixel/mm	9 Pixel/mm
<b>12 mm lens (default)</b>	<b>43 Pixel/mm</b>	<b>33 Pixel/mm</b>	<b>20 Pixel/mm</b>	<b>17 Pixel/mm</b>	<b>14 Pixel/mm</b>
25 mm lens (precision)	112 Pixel/mm	75 Pixel/mm	41 Pixel/mm	33 Pixel/mm	27 Pixel/mm

