SP1500 Operation Manual
# Table of Contents

1 Manufacturing label ........................................................................................................... 5

2 Product Components ........................................................................................................ 6

3 Preface ................................................................................................................................ 7

  3.1 General ............................................................................................................................ 7
  3.2 Product Tracking ............................................................................................................. 8

4 Technical Data ..................................................................................................................... 9

  4.1 General Description ........................................................................................................ 9
  4.2 Intended Use ................................................................................................................... 9
  4.3 Dimensions ..................................................................................................................... 10
  4.4 Mechanical Design ........................................................................................................ 11
  4.5 Control System ............................................................................................................. 11
  4.6 Laser Tubes ................................................................................................................... 11
  4.7 Laser Safety .................................................................................................................. 12
  4.8 Ambient Conditions ...................................................................................................... 12
  4.9 Options .......................................................................................................................... 12
  4.10 Electrical Connection ................................................................................................. 13
      4.10.1 Electrical connection for laser system ................................................................. 13
      4.10.2 Electrical connection for water cooling (option) .................................................. 13
  4.11 Materials ..................................................................................................................... 14

5 Safety .................................................................................................................................. 15

  5.1 Safety Instructions ......................................................................................................... 15
      1.1 Intended user group .................................................................................................... 15
      1.2 Operating instructions / Safety equipment ............................................................... 15
  5.2 General Safety Instructions .......................................................................................... 16
      2.1 General ...................................................................................................................... 16
      2.2 Laser ........................................................................................................................ 19
      2.3 Transport ................................................................................................................... 20
  5.3 Secondary Risks ............................................................................................................ 21
      3.1 General ...................................................................................................................... 21
      3.2 Crushing hazard ....................................................................................................... 21
  5.4 Signage .......................................................................................................................... 22

6 Transport - Storage - Setup ............................................................................................... 24

  6.1 Forklift transport ............................................................................................................ 24
  6.2 Shipping conditions ....................................................................................................... 26
  6.3 Unloading, inspection and damage reporting ............................................................... 26
  6.4 Storage conditions ........................................................................................................ 26
  6.5 Storage Location .......................................................................................................... 26
  6.6 Installation Site ............................................................................................................. 27
  6.7 Space Requirements ..................................................................................................... 27
  6.8 Necessary Feed Lines .................................................................................................. 27
  6.9 Setup ............................................................................................................................ 28
  6.10 Connections ................................................................................................................. 29
      6.10.1 Cooling System ..................................................................................................... 30

7 Machine view ....................................................................................................................... 31

8 Operation .............................................................................................................................. 32

  8.1 Key pad – Overview ..................................................................................................... 32
8.2 Key pad – Description ........................................................................................................... 33
8.3 Workpiece Removal Door ..................................................................................................... 36
8.4 Tables ..................................................................................................................................... 37
  8.4.1 Cutting Table (Standard Table) ......................................................................................... 37
  8.4.2 Vacuum Table ...................................................................................................................... 37
8.5 Operation .................................................................................................................................. 38
8.6 Changing the lens ....................................................................................................................... 39

9 Maintenance ................................................................................................................................. 44
  9.1 Cleaning optics on the Laser Head ......................................................................................... 44
  9.2 Cleaning the Mirrors ............................................................................................................... 45
  9.3 Cleaning the Exhaust hose connector ..................................................................................... 46
  9.4 Maintenance plan ..................................................................................................................... 47

10 Appendix .................................................................................................................................... 48
  10.1 EU – Declaration of conformity ......................................................................................... 48
  10.2 Acceptance report ............................................................................................................... 49
  10.3 Acceptance report ............................................................................................................... 50
  10.4 Response Form ..................................................................................................................... 51
  10.5 How to create a Service File ............................................................................................... 52
1 Manufacturing label

You find the manufacturing label with the CE-sign on the back side of the machine.

Enter the serial number, model and year of manufacture from the manufacturing label here. This information is important for troubleshooting problems with the product and for ordering replacement parts.
2 Product Components

- Lenses 2.5" / 5" (7.5" optional)
- CD-ROM
- Focusing tool
- Allen wrench kit 7-part
- Vacuum connection cable
- RS232-cable (TroCAM / i-Cut)
- USB cable
- Power cord
- Cleaning kit
3 Preface

3.1 General

This operating manual is intended to simplify the following for you:

- Learning about the machine, and
- Utilizing the machine’s capabilities according to its intended use.

The operating manual contains important notes on how to operate the machine:

- Safely,
- Properly, and
- Economically

Following the operating instructions helps you to:

- Avoid hazards and risks,
- Minimize repair costs and downtimes, and
- Increase the reliability and service life of your machine.
3.2 Product Tracking

We have a legal duty to track our products after delivery to our customers.

In particular, this relates to:

- Recurring faults in functions
- Anything that is unclear, e.g. in operation, maintenance or instructions
- Any accidents that occur
- Other unusual observations
- Recommendations for improvement, requests

This information serves as a basis for potential corrections and/or changes to the product, and it is therefore of great interest to us.

We request that you inform us of any such events and offer us your recommendations. This is the only way that we can improve our products as necessary, and to make them as safe and reliable as possible.
4 Technical Data

4.1 General Description

All electronic components are integrated in the machine.

All necessary connections are made on the back side of the SP1500. Controls for the SP1500 are located on the keypad.

The SP1500 is equipped with an interlock safety system. When the interlock is activated, only setup tasks can be performed on the SP1500.

The machine has a manual table changing system that enables use of the optimal table for specific jobs.

4.2 Intended Use

The Trotec SP1500 is designed for engraving and cutting of the materials listed in this document.
## 4.3 Dimensions

### Table of Dimensions

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Dimension</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Length</td>
<td>2829 (112)</td>
<td>mm (inch)</td>
</tr>
<tr>
<td>B</td>
<td>Width</td>
<td>2197 (87)</td>
<td>mm (inch)</td>
</tr>
<tr>
<td>C</td>
<td>Height, closed</td>
<td>1293 (51)</td>
<td>mm (inch)</td>
</tr>
<tr>
<td>D</td>
<td>Height, open</td>
<td>1950 (77)</td>
<td>mm (inch)</td>
</tr>
</tbody>
</table>

Weight – depends on product model ............... 1200 - 1300kg
(2646 - 2867 lbs)
### 4.4 Mechanical Design

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Working area</strong></td>
<td>1500 x 1250 mm (59 x 49 in)</td>
</tr>
<tr>
<td><strong>Feed area</strong></td>
<td>1700 x 1600 mm (66 x 62 in)</td>
</tr>
<tr>
<td><strong>Max. height of work piece</strong></td>
<td>30 / 53 / 75 mm (1.18 / 2.08 / 2.95 in) (3 work table levels) 185 mm (7.28 in) without work table (flatness cannot be guaranteed without work table)</td>
</tr>
<tr>
<td><strong>Speed of motion system</strong></td>
<td>165 cm/s (65 in/sec)</td>
</tr>
<tr>
<td><strong>Acceleration</strong></td>
<td>9.55 m/s² (375 in/sec²)</td>
</tr>
<tr>
<td><strong>Motor</strong></td>
<td>Brushless DC servomotor</td>
</tr>
<tr>
<td><strong>Encoder</strong></td>
<td>Increment measuring system</td>
</tr>
<tr>
<td><strong>Lenses</strong></td>
<td>2.5&quot; and 5.0&quot; (Standard), 7.5&quot; (optional) Lenses and all reflective mirrors are air-flushed and therefore protected from soiling (preinstalled air pump)</td>
</tr>
<tr>
<td><strong>Max. area load of workpiece table</strong></td>
<td>25 kg (55 lbs) over entire working area</td>
</tr>
<tr>
<td><strong>Precision</strong></td>
<td>±0,1 mm (±0.004 inch) over entire working area (depends on material)</td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>&lt; ±15 µm (&lt; ±0.00059 inch)</td>
</tr>
</tbody>
</table>

### 4.5 Control System

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Laser power</strong></td>
<td>Adjustable 0 – 100% (Typically 10-100%)</td>
</tr>
<tr>
<td><strong>Hardware Interface</strong></td>
<td>USB, RS-232 (RS-232 mandatory for TroCAM and i-Cut)</td>
</tr>
<tr>
<td><strong>Software Interface</strong></td>
<td>ASCII, HPGL, Trotec Protocol</td>
</tr>
</tbody>
</table>

### 4.6 Laser Tubes

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Laser tubes</strong></td>
<td>Sealed off CO2 laser, maintenance free, Laser power of 60-400W</td>
</tr>
<tr>
<td><strong>Wavelength</strong></td>
<td>10.6 µm</td>
</tr>
</tbody>
</table>

4.7 Laser Safety

<table>
<thead>
<tr>
<th>Laser class</th>
<th>CDRH Laser Safety; CE tested Laser class 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interlock</td>
<td>Dual interlock safety system</td>
</tr>
</tbody>
</table>

4.8 Ambient Conditions

Prescribed ambient temperature of +15° to +25°C (+59° to +77°F)
Humidity of 40% to max. 70%, no condensation,
dust-free environment (2nd degree per IEC60947-1)

4.9 Options

<table>
<thead>
<tr>
<th>CCD-camera</th>
<th>Registration marks and compensation system „i-Cut“; max. working area: 1100 x 700 mm (43 x 27.5 in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas-Kit (for compressed air respectively process gas)</td>
<td>Considered for control of compressed air and process gas (free of mechanical dust, water and oil) max. flow rate 150 l/min (40 gpm) with max. 10 bar (145 psi) max. limit 4 bar on working head push fitting connection with out diameter) connection on the machine with hose out diameter of 6mm (0.23 in) resp. standard fitting for compressed air.</td>
</tr>
<tr>
<td>Vacuum table</td>
<td>Strong vacuum effect for thin or corrugated materials (3500 m³/h at 500 Pa)</td>
</tr>
<tr>
<td>TroCAM (refer to TroCAM brochure)</td>
<td>CAD / CAM software for perfect cutting results; inclusively nesting-function, lead-in/lead-out, tool paths</td>
</tr>
<tr>
<td>Extraction System lead /follow-up time</td>
<td>Lead- and follow-up time fully adjustable</td>
</tr>
</tbody>
</table>
### 4.10 Electrical Connection

#### 4.10.1 Electrical connection for laser system

<table>
<thead>
<tr>
<th>Laserpower</th>
<th>60 W</th>
<th>100 W</th>
<th>200 W</th>
<th>400 W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>208/230 V, 1 phase</td>
<td>208/230 V, 1 phase</td>
<td>380/400 V, 3 phases</td>
<td>380/400 V, 3 phases</td>
</tr>
<tr>
<td>Fuse</td>
<td>16 A, slow</td>
<td>20 A, slow</td>
<td>3 x 20 A, slow</td>
<td>3 x 25 A, slow</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Phases</td>
<td>L, N, PE</td>
<td>L, N, PE</td>
<td>L1, L2, L3, N, PE</td>
<td>L1, L2, L3, N, PE</td>
</tr>
<tr>
<td>Power</td>
<td>2.6 kW</td>
<td>3.5 kW</td>
<td>5.5 kW</td>
<td>9.5 kW</td>
</tr>
</tbody>
</table>

#### 4.10.2 Electrical connection for water cooling (option)

**EU**

<table>
<thead>
<tr>
<th>Laserpower</th>
<th>60 W</th>
<th>100 W</th>
<th>200 W</th>
<th>400 W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required refrigerating capacity [W]</td>
<td>500</td>
<td>2300</td>
<td>4000</td>
<td>8000</td>
</tr>
<tr>
<td>Chiller type</td>
<td>Chilly 08-S</td>
<td>Chilly 25-S</td>
<td>Chilly 45-S</td>
<td>CWK 90-S</td>
</tr>
<tr>
<td>Refrigerating capacity [W]</td>
<td>890</td>
<td>2400</td>
<td>5300</td>
<td>9500</td>
</tr>
<tr>
<td>Rate of flow l/min</td>
<td>7.2</td>
<td>10</td>
<td>16</td>
<td>30</td>
</tr>
<tr>
<td>Pressure in bar</td>
<td>2.9</td>
<td>2.7</td>
<td>3.5</td>
<td>3.4</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>1x230V, 50/60Hz</td>
<td>1x230V, 50/60Hz</td>
<td>1x230V, 50Hz</td>
<td>3x400V, 50/60Hz</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>900</td>
<td>1800</td>
<td>3000</td>
<td>5900</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>L, N, PE</td>
<td>L, N, PE</td>
<td>L, N, PE</td>
<td>L1, L2, L3, N, PE</td>
</tr>
</tbody>
</table>

**US**

<table>
<thead>
<tr>
<th>Laserpower</th>
<th>60 W</th>
<th>100 W</th>
<th>200 W</th>
<th>400 W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required refrigerating capacity [W]</td>
<td>500</td>
<td>2300</td>
<td>4000</td>
<td>8000</td>
</tr>
<tr>
<td>Chiller type</td>
<td>Chilly 08-S</td>
<td>Chilly 25-S</td>
<td>Chilly 35-S</td>
<td>CWK 90-S</td>
</tr>
<tr>
<td>Refrigerating capacity [W]</td>
<td>890</td>
<td>2400</td>
<td>4500</td>
<td>11000</td>
</tr>
<tr>
<td>Rate of flow l/min</td>
<td>8</td>
<td>10</td>
<td>15.2</td>
<td>36</td>
</tr>
<tr>
<td>Pressure in bar</td>
<td>3.7</td>
<td>3.5</td>
<td>3.7</td>
<td>4.8</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>1x115V, 60Hz</td>
<td>1x115V, 60Hz</td>
<td>1x230V, 50/60Hz</td>
<td>3x400V, 50/60Hz</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>900</td>
<td>1800</td>
<td>3000</td>
<td>5900</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>L, N, PE</td>
<td>L, N, PE</td>
<td>L, N, PE</td>
<td>L1, L2, L3, N, PE</td>
</tr>
</tbody>
</table>
4.11 Materials

Caution when processing conductive materials (carbon fibers,…)! Conductive dust or particles in the ambient air might damage electrical components and lead to short circuits. Bear in mind that those defects are NOT warranted.

<table>
<thead>
<tr>
<th>Material</th>
<th>Engraving</th>
<th>Cutting</th>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylic</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Painted metal</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Delrin</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Stainless steel (with Thermark)</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Anodized aluminum</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Veneer</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Handicrafts</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Glass</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wood</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Gum rubber</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Ceramic</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Cork</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Plastics</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Laser rubber</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leather</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>MDF</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melamine</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Micro porous rubber</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Paper</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Polyester</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Stone</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC (Polycarbonate)</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
</tbody>
</table>

Other materials only with written approval by Trotec

The following materials are not recommended for processing:
Polyurethane PUR, Polyvinyl chloride PVC, Polyvinyl butyral PVB, Polytetrafluorethylene PTFE and materials containing epoxy or phenolic resins

Caution:
Trotec assumes no responsibility for any consequences of laser processing in any application such as medical or pharmaceutical applications.
5 Safety

5.1 Safety Instructions

Operating personnel must read and understand the operating instructions, and especially the “Safety” chapter, before operating the equipment. We recommend that the operator create internal instructional documentation for equipment safety and operation and to acknowledge receipt of these instructions/operating manual and participation in training/education in writing (see documents in the Appendices).

1.1 Intended user group

The machine may only be operated by authorized persons. Authorities must be clearly defined and observed, so that no unclear competencies result under the aspect of safety. This applies in particular to work performed on the electrical equipment that may only be performed by specially trained professionals.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Intended group of users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control/operation</td>
<td>Trained personnel</td>
</tr>
<tr>
<td>Other activities (e.g. error correction, maintenance)</td>
<td>Specially trained personnel or hired tradesmen</td>
</tr>
</tbody>
</table>

1.2 Operating instructions / Safety equipment

The safety zone is defined by the operator. Instructions and guidelines must be observed and followed!

**Top view**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EMERGENCY-OFF pushbutton</td>
</tr>
<tr>
<td>2</td>
<td>Key switch</td>
</tr>
<tr>
<td>3</td>
<td>ON-OFF switch</td>
</tr>
<tr>
<td>4</td>
<td>Safety covers</td>
</tr>
</tbody>
</table>
5.2 General Safety Instructions

2.1 General

**Hazard due to improper use of the machine!**
Improper use may lead to hazards and bodily injury and damage to assets.
- Prohibit or prevent improper use.

**Hazard due to disregard of safety instructions!**
Improper activities at the machine may lead to death, bodily injury and/or damage to the machine.
- Before startup read and observe the operating manual and safety instructions!

**Hazard due to faulty behavior by untrained persons!**
Improper activities at the machine may lead to death, bodily injury and/or damage to the machine.
- Inform personnel about machine functions and potential risks and record this in the training record.
- Observe legal regulations related to operation of machines and accident prevention regulations.

**Hazard due to poor lighting, poor housekeeping and moisture!**
Shadows, reflections and poor housekeeping increase the risk of an accident.
- Light the work area well, and always keep it clean and dry.

**Hazard due to missing, defective or bypassed safety equipment or machine parts!**
Nonfunctioning or missing safety equipment or machine parts may lead to death, bodily injury and/or damage to the machine.
- Carefully check safety equipment and machine parts for proper operation.
- In case of a functional fault or defect, immediately take prescribed actions to correct the problem.

**Hazard due to operator error (especially in setup mode)!**
Adjustment and control with insufficient knowledge of the machine may lead to death, bodily injury and/or damage to the machine.
- Before startup read and observe the operating manual and safety instructions!

**Hazard due to unsupervised operation of the machine!**
Unsupervised operation may lead to fire resulting in death, bodily injury and/or damage to the machine.
- Never operate the machine without supervision!
Hazard due to reckless actions!
Reckless actions may lead to death, bodily injury and/or damage to the machine.
- Make sure that no personnel remain in the hazardous area or at the machine.
- Do not leave any foreign objects in the machine (tools, etc.).

Hazard due to operator error by unauthorized persons!
Adjustment and control of the machine by persons with inadequate knowledge of machine operation may lead to death, bodily injury and/or damage to the machine.
- Never inadvertently actuate the machine.
- Turn the main switch off when the machine is not being used.

Hazard during faulty work process!
Deviations in machine processing and work results may be an indication of hazardous conditions (jammed product, loose guides, etc.).
- Observe machine movements for proper operation and check work results on a regular basis.
- In case of deviations, initiate prescribed actions.

Hazard due to premature actuation!
Premature actuation of the machine may lead to death, bodily injury and/or damage to the machine.
- Do not reach into hazardous areas until you have turned off the main switch and placed a service sign on it.

Hazard due to inadequate cleaning or functional checks!
Inadequate cleaning or functional checks result in machine damage. Accumulation of dirt could impair mechanical functions.
- Regularly check machine and connection lines for damage and wear. In case of damage, immediately initiate prescribed actions.
- Keep machine, handles and switches free of oil, grease, dirt and moisture.

Hazard due to unsuitable tools!
The use of improper tools could result in a risk of bodily damage and/or damage to the machine. Poor housekeeping leads to elevated accident risk.
- Use proper tools for maintenance jobs.
Hazard due to missing machine signage!
The risk of machine operator error results from making incorrect assumptions.
  ● Replace missing machine signage.

Hazard due to fault that cannot be corrected!
A fault that cannot be corrected may lead to injury and/or damage to the machine.
  ● Turn off the machine and call customer service!

Hazard due to improper disposal (waste, production materials)!
Improper disposal of waste materials can lead to environmental damage.
  ● Recycle recyclable materials in separated and clean state. Dispose of waste in accordance with applicable legal regulations.

Hazard due to inferior replacement parts or parts from other companies!
The use of inferior replacement parts or parts from other companies impairs machine safety and invalidates the supplied Conformity Declaration (CE).
  ● Replace wear parts or damaged machine, safety or electrical components with original replacement parts. Only use the accessories or auxiliary devices identified in the operating manual.

Hazard due to unsuitable work clothing or lack of protective equipment!
Risk of injury due to catching on machine parts, falling loads, inhalation of dust particles and noise.
  ● Wear suitable work clothing.
  ● Wear safety glasses.
  ● Wear hearing protection (mandatory for noise levels >85 dB(A))
2.2 Laser

The machine is:
- Safety class 2

**Hazard due to laser radiation without protective measures!**
Lack of protective measures can result in:
- Burns on the corneas of the eyes,
- Skin burns, and
- Fire hazard for clothing

- Never operate machine without protective equipment
- Unapproved modification or disassembly of the laser is prohibited
- Never manipulate the laser unit
- Do not bypass the interlock system

**Hazard in processing unapproved material!**
Processing of materials not listed and approved in this operating manual is prohibited.

**Processing medical technology and pharmaceutical products!**
Trotec assumes no responsibility for any consequences or the suitability of laser processing for any applications, especially those in the medical technology or pharmaceutical fields.

**Hazard when working with the cutting table!**
If not all of the partition plates are used in the cutting table, there is a risk of fire due to reflection of the laser beam.

- Insert anti-reflective material beneath the partition plates.
2.3 Transport

**Hazard of loads impacting persons or objects!**
Falling, tipping or sliding loads may lead to death, bodily injury and/or damage to the machine.

- Never let loads impact persons.
- Set up unloading station before lifting loads. Avoid unnecessarily long periods of lifting.
- Do not lift loads until you have a clear view of the travel route. Choose travel routes that are as unobstructed as possible.

**Hazard due to lifting equipment operator error by untrained personnel!**
Improper operation of lifting equipment may lead to death, bodily injury and/or damage to the machine.

- Operation of lifting equipment only by trained personnel.
- Wear protective helmet, safety shoes and gloves.
5.3 Secondary Risks

3.1 General

**Hazard due to materials hazardous to health!**
- In processing with or use (cleaning, etc.) of hazardous materials (toxic, etc.), appropriate measures should be taken to avoid health hazards.

**Hazard due to operator error!**
Errors are possible even when the machine is operated properly following the functions and sequences described in the operating manual. Such errors may lead to death, bodily injury and/or damage to the machine.
- Do not initiate any work or adjustment activities while any personnel are located in the hazardous area.

**Hazard due to add-on options or machines!**
Adding on options or machines can lead to unknown risks and hazards.
- Modifications made to the machine without approval by Trotec invalidates the Conformity Declaration (CE) supplied with the product.

3.2 Crushing hazard

**Hazard due to moving parts!**
Reaching, stepping or leaning into the hazardous area may result in serious injury by crushing body parts, severing fingers or the hand!
- Do not initiate any work process on the machine while persons (helpers, etc.) are located in the hazardous area of the machine.
- Prohibit access to the hazardous area.
- Wear suitable work clothing (no loose clothing, jewellery, or similar.).
### 5.4 Signage

The warning and information labels are attached in such positions of the device that could represent a source of danger during set-up and operation. Therefore, follow the information on the labels. If labels are lost or damaged, they must be replaced immediately.

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Label</th>
<th>Position (see also pictures on the next page)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CAUTION CLASS 4 INVISIBLE LASER RADIATION</td>
<td>a) External: frontside top cover, left side</td>
</tr>
<tr>
<td></td>
<td>WHEN OPEN AND INTERLOCKS DEFEATED</td>
<td>b) External: backside top cover, right side</td>
</tr>
<tr>
<td></td>
<td>AVOID EYE OR SKIN EXPOSURE TO</td>
<td>c) External: maintenance panel front locker</td>
</tr>
<tr>
<td></td>
<td>DIRECT OR SCATTERED RADIATION</td>
<td>d) External: maintenance panel back locker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e) External: next to service plug</td>
</tr>
<tr>
<td>2</td>
<td>LASERDIODE MAX. POWER &lt; 1mW cw</td>
<td>a) External: at control panel</td>
</tr>
<tr>
<td></td>
<td>WAVELENGTH 655nm</td>
<td>b) Internal: maintenance panel at the top</td>
</tr>
<tr>
<td>3</td>
<td>CAUTION CLASS 2 LASER RADIATION WHEN OPEN</td>
<td>a) External: frontside top cover, left side</td>
</tr>
<tr>
<td></td>
<td>DO NOT STARE INTO BEAM</td>
<td>b) External: backside top cover, right side</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) External: maintenance panel front locker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d) External: maintenance panel back locker</td>
</tr>
<tr>
<td>4</td>
<td>LASER APERTURE</td>
<td>a) Internal: working area, at x-axis left side</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Internal: maintenance panel at laser diode</td>
</tr>
<tr>
<td>5</td>
<td>CO2 laser</td>
<td>External: at control panel</td>
</tr>
<tr>
<td></td>
<td>Power Range 40-400 W</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wavelength 10600 nm</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>LASER RADIATION DO NOT STARE INTO THE BEAM</td>
<td>Internal: maintenance panel at the top</td>
</tr>
<tr>
<td></td>
<td>CLASS 2 LASER PRODUCT</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>INPUT POWER 380-400VAC 50HZ</td>
<td>External: next to the power socket</td>
</tr>
<tr>
<td>8</td>
<td>BEFORE OPEN UNPLUG THE MACHINE FIRST</td>
<td>a) External: service panel front locker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) External: service panel back locker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) Internal: service panel, cover of electronics</td>
</tr>
<tr>
<td>9</td>
<td>NEVER OPERATE THE LASER SYSTEM WITHOUT CONSTANT</td>
<td>External: at the front cover, right side</td>
</tr>
<tr>
<td></td>
<td>SUPERVISION EXPOSURE TO THE LASER BEAM MAY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CAUSE IGNITION OF COMBUSTIBLE MATERIALS WHICH</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CAN CAUSE SEVERE DAMAGE TO THE EQUIPMENT</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>a) External: at control panel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Internal: working area, at x-axis left side</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) External: maintenance panel front locker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d) External: maintenance panel back locker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e) Internal: at mirror 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>f) Internal: at laser diode (mirror 2)</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>a) External: next to the power socket</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) External: service panel front locker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) External: service panel back locker</td>
</tr>
</tbody>
</table>
Front and right side

1, 3
2, 5, 10
4, 10
8
8, 11

(1, 3, 10)

Back and left side

7, 11
8, 11
2, 6
4, 10

(1, 3)

(7, 11)

(8, 11)

(4, 10, position depends on laser type)

(1, 3, 10)

(10, position depends on laser type)
6  Transport - Storage - Setup

6.1  Forklift transport
You receive your SP1500 packed in a wooden crate. If possible keep the packing box. You might require it in case of a return.

1. Remove the top cover of the wooden box. Then the side covers. For this work we strongly recommend to use an electric screwdriver.

SP1500 kept in position by wooden spacers

Please note that the machine housing is reinforced only on certain positions so that a fork lift truck can lift the machine.

The following suspension points are available:

- machine front and back
- left and right side

These positions are marked. See also the yellow colored bars besides (bottom view).
Never place the forks on other positions, as this could cause severe damages on the housing and affect cutting precision as well as life expectancy of the motion system.

The machine may only be lifted and transported:
- under the guidance of a 2nd person
- at the marked points
- with a fork lift carrying 2000kg (4.4 lb) and
- forks of minimum 2m length
2. Carefully lift the machine from the box floor.

![Machine being lifted](image1)

3. Position the SP1500 on an even floor capable of carrying the machine weight. This location must meet the ambient requirements mentioned below.

![Machine on floor](image2)
6.2 Shipping conditions
- When transporting outdoors, only transport in shipping vehicles with roofs or sufficient weather protection.
- Protect machine from shipping damage using tie-down straps, packaging materials and sufficient gaps to other shipped goods.
- Ambient temperature for transport:
  Minimum temperature  +10 °C (+50 F)
  Maximum temperature  +40 °C (+104 F)
- Handle machine and machine parts with care.
- Do not place any heavy loads on top of the machine or machine parts.
- Avoid harsh impacts.
- Only lift at the specified points.
- Take special care in transporting electronic components.

6.3 Unloading, inspection and damage reporting
After unloading:
- Remove shipping packaging.
- Dispose of packaging according to applicable waste disposal law.
- Inspect machine and machine parts for shipping damage.
- Check shipment for completeness.

In case of shipping damage or incomplete shipment:
- Immediately document the details of the damage.
- Also note the claim on shipping papers.
- Photograph the damage.
- Send report to Trotec.

6.4 Storage conditions
- Store machine and machine parts in a dry area.
- Protect machine and machine parts from scratches.
- Store electronic components especially carefully in a packaged state.
- In case of longer term storage, protect exposed metal parts (e.g. oil the parts).
- Ambient temperature for storage:
  Minimum temperature  +10 °C (+50 F)
  Maximum temperature  +40 °C (+104 F)

6.5 Storage Location
In storage room or packaged with adequate weather protection. The storage location must be free of caustic materials, vapors and combustible materials.
6.6 Installation Site
- Weather-protected, roofed building with vehicular access
- Low dust environment

Properties of the installation site:
- Adequate lighting
- Uniform, level, horizontal and firm floor, planarity +/-5 mm
  (+/-0.1969 inch), no special foundation required
- Load bearing capacity of base frame at least 500 kg/m²
  (105 lbs/sq.ft.)

Installation site must:
- Be free of noisy electrical installations, hoses and pipe lines
- Have power supply that is free of fluctuations
- Be shielded from EMC

Ambient Conditions:
- Relative humidity: 40% to max. 70%
- Ideal room temperature: +15°C to +25°C (+59 F to +77F)
- Dust-free environment (2nd degree per IEC60947-1)

6.7 Space Requirements

6.8 Necessary Feed Lines
- Electrical
- Compressed air: Free of oil, water and dirt at max. 10 bar (145 psi)
- Gases (Neutrogen, Argon, protective gas, …)
6.9 Setup

Align machine to horizontal level by adjusting the feet, and check with a water level. Measure the level on the x-axis and y-axis.
For the adjustment of the feet a 24mm wrench is necessary.
## 6.10 Connections

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Electrical power</td>
<td>6</td>
<td>Cooling water connectors</td>
</tr>
<tr>
<td>2</td>
<td>Connection cable exhaust system</td>
<td>7</td>
<td>Compressed air (Gas 1 – standard connector)</td>
</tr>
<tr>
<td>3</td>
<td>RS-232 for PC (mandatory for i-Cut/AlphaCam)</td>
<td>8</td>
<td>Gas 2</td>
</tr>
<tr>
<td>4</td>
<td>USB for PC</td>
<td>9</td>
<td>Table exhaust connector (200mm)</td>
</tr>
<tr>
<td>5</td>
<td>Head exhaust connector</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.10.1 Cooling System

**Note:** It's important to connect the "water in" of the SP1500 with the "water out" of the chiller, and the "water out" of the SP1500 with the "water in" of the chiller.

1. Start the chiller.
2. Start the laser machine (note order!).

Sketch of Chillers
for Laser Power 60W to 200W:

Sketch of Chiller
for Laser Power 400W:
7 Machine view

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Working head</td>
<td>6</td>
<td>Main switch</td>
</tr>
<tr>
<td>2</td>
<td>X-Axis</td>
<td>7</td>
<td>Top Cover</td>
</tr>
<tr>
<td>3</td>
<td>Working table</td>
<td>8</td>
<td>Keypad</td>
</tr>
<tr>
<td>4</td>
<td>Removal door for leavings / waste</td>
<td>9</td>
<td>Service Panel</td>
</tr>
<tr>
<td>5</td>
<td>Maintenance panel</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8 Operation

8.1 Key pad – Overview

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Key switch</td>
<td>13</td>
<td>Button: Start (repeat) - JobControl only</td>
</tr>
<tr>
<td>2</td>
<td>EMERG. OFF push button</td>
<td>14</td>
<td>Button: “Shift” for 2nd function key level</td>
</tr>
<tr>
<td>3</td>
<td>Indicator: Interlock on/off</td>
<td>15</td>
<td>LED status indicator: Laser beam</td>
</tr>
<tr>
<td>4</td>
<td>Indicator: Cooling on/off</td>
<td>16</td>
<td>Button: Working head to left</td>
</tr>
<tr>
<td>5</td>
<td>Button: Compressed Air (Gas 1)</td>
<td>17</td>
<td>Button: Working head to right</td>
</tr>
<tr>
<td>6</td>
<td>Button: Gas 2</td>
<td>18</td>
<td>Button: Working head forward</td>
</tr>
<tr>
<td>7</td>
<td>Air assist (internal)</td>
<td>19</td>
<td>Button: Working head backward</td>
</tr>
<tr>
<td>8</td>
<td>Light: compressed air, Voltage (AC, DC)</td>
<td>20</td>
<td>Not used</td>
</tr>
<tr>
<td>9</td>
<td>Button: Vacuum on/off</td>
<td>21</td>
<td>Not used</td>
</tr>
<tr>
<td>10</td>
<td>Button: Standby</td>
<td>22</td>
<td>LED status indicator</td>
</tr>
<tr>
<td>11</td>
<td>Button: Pause</td>
<td>23</td>
<td>Manometer for gas pressure</td>
</tr>
<tr>
<td>12</td>
<td>Service LED</td>
<td>24</td>
<td>Pressure regulator</td>
</tr>
</tbody>
</table>
8.2 Key pad – Description

Key switch (1)

EMERGENCY OFF pushbutton (2)
Pressing this button shuts the machine down completely. The EMERGENCY OFF pushbutton must be unlocked to start up the machine again.

Interlock on/off indicator (3)
Interlock indicator lights when the machine is turned on, and:
- Guard door or door is open
- Cover plate is not installed
If the Interlock Indicator is unlit, the machine is ready for production.

Cooling on/off indicator (4)

Switching-in process gas
- Compressed Air (Gas 1) on/off key (5)
- Gas 2 on/off key (6)

Pressure regulator (24)
This is used to adjust the required gas pressure of the gas used. The pressure setting is displayed on the:
Manometer for gas pressure (23)

Air assist on/off indicator (7)
Air assist is switched on/off by simultaneously pressing these keys:
“Shift” for 2nd function key level (14)
and
Vacuum on/off (9)

Compressed air, voltage (AC, DC) (8)
Lights in following conditions:
- Compressed air missing
- AC-Voltage failure (L1, L2, L3, N)
- DC-Voltage failure (power supplies)
Vacuum on/off key (9)
When this key is pressed it lights and vacuum is switched on for the vacuum table.

Standby key (10)
During machine operation key illumination is off.
When the key is pressed it lights and the machine is in Standby mode, i.e.:
- Laser in Ready state
- Lighting of work table is deactivated
- Blowers for laser tubes are deactivated

Pause key (11)
During machine operation key illumination is off.
When the key is pressed it lights and the work process being executed is stopped.

Lamp for service plug (12)
Lights when a service plug is inserted (Technician)

Start (Repeat) key (13)
Key for starting the job program and repeating the last job program; see programming manual regarding this.

“Shift” key for 2nd function key level (14)
For additional operations. When this key is pressed together with the following keys, the functions indicated are activated:
- Vacuum on/off key (9):
  Air assist on/off
- Pause key (11):
  Stops the job program
- Working head keys (16) to (19)
  These keys drive the laser head to the end position (left/backwards)
- Start key (13):
  Tests the laser for proper function

LED status indicator for laser beam (15)
Lightened when laser is operating.
Movements of the laser head:
- Key: Working head to left (16)
- Key: Working head to right (17)
- Key: Working head forward (18)
- Key: Working head backward (19)

When 2 adjacent keys are pressed simultaneously (e.g. keys 16 and 19), the laser head moves diagonally.

Movements of the work table (20, 21):
Not used on SP1500

LED status indicator (22)
- Flashes 1x/sec -> Machine ready for operation
- Flashes 2x/sec -> Interlock ON
8.3 Workpiece Removal Door

- Open door by turning the lock (1) and pulling forward on the two handles
  CAUTION door is HEAVY

- Remove the waste or workpieces

Door must be closed during laser operation.
8.4 Tables

8.4.1 Cutting Table (Standard Table)

8.4.2 Vacuum Table

- The vacuum table is only intended for engraving and/or cutting thin and lightweight materials such as films, plastic laminates, veneers, thin sheets of wood, paper, cardboard, and similar.

- The entire surface of the vacuum table must be covered to ensure the maximum vacuum effect.
8.5 Operation

Enable machine with the key switch (1)

Check whether EMERGENCY-OFF pushbutton (2) is unlocked (pull to release)

Turn on main switch (3)

Wait until reference movement is finished (covers have to be closed)

Drive the laser head to its forward-end position and drive it upward with the adjusting screw (4)

Clean lens, reinstall and secure

Install nozzle

Carefully place material on table

**Focussing the laser**

Place focus tool on laser head
Drive the working head downward until focus tool drops out.

Machine is now ready for production.
8.6 Changing the lens

**Info** Use disposable gloves to avoid direct contact with the optics.

1. Turn the laserhead all the way down to allow enough space.

2. If necessary, reduce the distance from the nozzle to the material to move even further down.
3. Loosen the two screws to remove the cylinder.

4. Loosen the cylinder by turning.

5. Remove both cylinders together from the laser head (outer and inner cylinder - see overview).

6. Lay the outer cylinder aside.
7. Loosen the lens holder by turning and carefully remove the lens.

8. Put the lens on a cleaning cloth.
   Clean the lens on both sides with the cleaning fluid and wipes.
   
   **Info** Check lens for cleanliness and damage.

9. Put the lens correctly in the socket.
   
   **Notice** Put the curvature or convex side of the lens upwards.

10. Screw the socket on the cylinder again.
11. Put the cylinder back into the laserhead and screw it in.

**Info** If both cylinders are not concentrically fixed over the thread, the lower cylinder cannot be screwed into the thread.

12. Tighten the two previously loosened screws securing the upper cylinder.
13. Screw the laserhead back in the Z-direction.

14. Focus with the corresponding focus tool and adjust the distance to the nozzle to the material surface (approx. 1 cm by default).
9 Maintenance

9.1 Cleaning optics on the Laser Head

Cleaning the mirror (1):
- Loosen and remove both screws (2)
- Remove mirror holder (3)
- Check mirror (1) for damage
- Clean mirror (1) with cleaning fluid and cleaning cloth
- Check mirror (1) for damage once again
- Reinstall mirror holder (3) and secure with two screws (2)

Cleaning lenses
- Loosen the two screws (4) holding the upper cylinder (5)
- Loosen the lower cylinder (6) by screwing it inward
- Remove both cylinders together
- Loosen lens holder (7) and remove lens
- Check lens for damage
- Clean both sides of lens with Cleaning fluid and cleaning cloth
- Check lens once again for damage
- Insert and fix lens in the reverse order (CAUTION: round side of lens has to face laser source)
9.2 Cleaning the Mirrors

- Unlock cover (1)
  - Tool: Metric Allen wrench No. 10 (6)

- Remove cover (1) by pulling on the handles (7)

3 mirrors (2) must be cleaned:

- Loosen both screws (3)
- Remove mirror holder (4)
- Check mirror (5) for damage
- Clean mirror (5) with Cleaning fluid and cleaning cloth
- Check mirror (5) once again for damage
- Put on mirror holder (4) and secure with two screws (3)
9.3 Cleaning the Exhaust hose connector

Back view:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Head exhaust connector</td>
</tr>
<tr>
<td>2</td>
<td>Table exhaust connector</td>
</tr>
</tbody>
</table>

Clean the head and table hose connector with a vacuum cleaner or a suitable brush regularly.

Check the protective grid weekly and optionally remove the deposits and clean the grid to ensure a good extraction.

**Risk of fire by deposits**
Deposits in the exhaust hose connections may occur flame formations.
- Check and clean the hose connections and the protective grid regularly.
- Comply with the maintenance plan!
## 9.4 Maintenance plan

<table>
<thead>
<tr>
<th></th>
<th>daily</th>
<th>weekly</th>
<th>monthly</th>
<th>yearly</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Laser</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lens, mirror #4</td>
<td>Check</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cleaning if</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mirrors #1...3</td>
<td>Check</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cleaning if</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processing table and</td>
<td>Cleaning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rulers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust hose</td>
<td></td>
<td></td>
<td></td>
<td>Check</td>
</tr>
<tr>
<td>connections</td>
<td></td>
<td></td>
<td></td>
<td>Cleaning if</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>required</td>
</tr>
<tr>
<td>Protective grid</td>
<td>Check</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cleaning if</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entire working area</td>
<td>Cleaning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– general cleaning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Exhaust System</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bag filter</td>
<td>According to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>the operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>manual of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>the exhaust</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filter mat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Particle filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activated carbon filter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cooling System</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump filter</td>
<td>According to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>the operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>manual of</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>the exhaust</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condenser heater</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling agent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For detailed information on the maintenance activities on exhaust and cooling systems please refer to the respective manuals.
10 Appendix

10.1 EU – Declaration of conformity
(Machine directive 2006/42/EG, appendix II A)

Manufacturer:
Trotec Laser GmbH
Linzer Straße 156,
A-4600 Wels

Authorized person for the compilation of technical documentation:
Gerhard KREMPL, Trotec Laser GmbH, Linzer Straße 156, A-4600 Wels

We hereby certify that

SP1500
Model N° 8018 SP1500

in its conception, construction and form put by us into circulation is in accordance with all the relevant
essential health and safety requirements of the EC machinery directive 2006/42/EEC.

Further valid guidelines/regulations for the product:
2006/95/EG Low Voltage Directive
2004/108/EG EMC Guideline

Applied harmonized standards:
- EN ISO12100 Machine Safety
- EN 60335-1/2007 Safety of Household and similar Appliances
- EN 55014-1-2006, EN 55014-2/1997 Electromagnetic Compatibility
- EN 55022/2008, EN 55024/2003 Electromagnetic Compatibility

Place, Date:
Wels, 30.03.2011

Personal data of the signer:
Stephan FAZENY, Head of Research and Development

Signature:

__________________________

CE
10.2 Acceptance report

Dear customer!

We request your confirmation of properly completed transfer of the machine

Please check applicable items:

- Machine parts checked for shipping damage
- Machine parts checked against delivery note
- Setup of the machine discussed
- Startup of the machine discussed
- Operation of the machine discussed
- Maintenance of the machine discussed
- Electrical voltage checked
- Safety Instructions discussed
- Trial run performed
- Deficiencies determined

Please transmit a copy of this document – filled out and signed by an authorized company representative – to an employee of our sales affiliate for forwarding to the manufacturer.

Thank you very much.

The machine with the

machine designation: SP1500

has been checked according to the listed items and has been transferred properly.

City, Date

Company stamp / Signature
10.3 Acceptance report

Employee/Trainee: ........................................................................................................

Trainer: .........................................................................................................................

Date of Training: .......................................................................................................... 

The above mentioned Employee received instruction on the operation of the SP1500 Lasersystem.
Especially the following topics are covered:

- Machine Function
- Danger Area
- Warnings
- Position Emergency-OFF Button
- Personal Protective Equipment
- Operating Facilities
- Work Flow
- Setting-up
- Taking into Service and Shutdown
- Announcement of unexpected working result and the resulting procedure
- Announcement of Failure and instituting Procedure
- Responsibility on remedial measure
- Operation Manual and its depository for inspection

................................................................. .................................................................
Signature of Trainer ................................................................. Signature of Trainee

10.4 Response Form

If you face any trouble with the machine, please provide the following information and add a Servicefile (procedure is described on the following pages).

<table>
<thead>
<tr>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Machine Details</th>
<th>Contact Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serialnumber</td>
<td>Name</td>
</tr>
<tr>
<td>JobControl Version</td>
<td>Country</td>
</tr>
<tr>
<td>Driver Version</td>
<td>Phone Number</td>
</tr>
<tr>
<td>Layout Software</td>
<td>Email address</td>
</tr>
<tr>
<td>Firmware Version</td>
<td></td>
</tr>
</tbody>
</table>

Problem Description

<table>
<thead>
<tr>
<th>Does an Error message show up on the PC, if so which one?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What happened before the error showed up? (Thunder&amp;Lighting, Windows-Update,…)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What was tried to solve the problem?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Please send the information to your sales representative or to techsupport@troteclaser.com.
10.5 How to create a Service File

1. Start JobControl.

2. Position the job (which possibly caused a failure) on the plate.

3. Run the job and leave the job on the plate.

4. Go to “Settings” > “Create Service File”.

5. The window „Save Service File to“ shows up. Please select a directory to save the file and click on „Save“.
6. The window „Add Layout File“ shows up. Please select the layout file, which was sent most recently to JobControl and possibly caused a failure (example: Corel file, Photoshop file, AutoCAD file,…). Click on „Open“.

7. The following window confirms, that the Service File (ServiceLog.txt) was created successfully.

8. Please send the Service File together with a picture of the bad result and detailed description to your sales representative or to techsupport@troteclaser.com.