



GeKaLaser M1500 GeKaLaser M2000

User Manual

Warning!

Read this instruction manual carefully before operating the machine.



UYGUNLUK ONAYI ATTESTATION of CONFORMITY

Sertifika No : 1102501803
Certificate Number
Üretici : Gedik Kaynak San. Ve Tic. A.Ş.
Manufacturer : Kargalıhanbaba Mahallesi, Organize Sanayi 1-8-10 Sokak Dış Kapı No: 27-3-2
HENDEK/SAKARYA
Ürün : Lazer Kaynak Makinesi
Product
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Yukarıda açıklanan ürün, INSPECCO Ürün Belgelendirme Prosedürüne göre incelenmiş ve Makine Direktifi 2006/42/AT Ek-1 Temel Sağlık ve Güvenlik Gereksinimlerine uygun olduğu görülmüştür. Bu sertifika gönüllülük esasına göre düzenlenmiş olup test ve belgelendirme için INSPECCO'ya gönderilen numune için geçerlidir. Üründeki değişiklikler veya yukarıda belirtilen yönetmelik veya standartlarda yapılan değişiklikler bu sertifikayı geçersiz kılabilir.

The product described above has been examined according to the INSPECCO Product Certification Procedure and has been found to comply with the Machinery Directive 2006/42/EC Annex-1 Essential Health and Safety Requirements. This certificate is issued on a voluntary basis and is valid for the sample sent to INSPECCO for testing and certification. Changes to the product or the regulations or standards mentioned above may invalidate this certificate.

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AT UYGUNLUK BEYANI EU DECLARATION OF CONFORMITY

Bu uygunluk beyanı yalnızca imalatçının sorumluluğu altında düzenlenir.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

Ürün / Product

LASER WELDING MACHINE

Marka-Model / Brand-Model

GeKaLaser M1500 & GeKaLaser M2000

Yukarıda tanımlanan beyanın nesnesi ilgili uyumlaştırılmış AB mevzuatı ile uyumludur.

The object of the declaration described above, is in conformity with the relevant union harmonisation legislation.

Referanslar / References

2006/42/EU

2014/35/EC

2014/30/EC

Uyumlaştırılmış standartlar ve uygunluğun deklare edilmesiyle ilişkili diğer referanslar.
References to the relevant harmonised standards used and references to the other technical specifications in relation to which conformity is declared.

TS EN ISO 11553-2

TS EN IEC 60204-1

TS EN IEC 61000-6-2

TS EN IEC 61000-6-4

TS EN 60825-1

Bu ekipman, talimatlara uygun kurulduğunda, bakımı yapıldığında ve kullanıldığında belirtilen standartlara uygundur. Makine üzerinde bir değişiklik yapıldığında veya yanlış kullanımda deklarasyon geçersiz olur.

The equipment is in compliance with pertinent legislation when installed, utilized, and maintained in accordance with the enclosed instructions. This declaration will be invalid under any modification or improper use.

İmalatçı adına imzalayan / Signed for and on behalf of:

Hatice Özel

Welding Equipment Sales and Project Development Director

İstanbul, Türkiye, 15.12.2025

İmalatçı / Manufacturer

GEDİK KAYNAK SANAYİ ve TİCARET A.Ş.

Ankara Caddesi, No: 306, Şeyhli 34906 Pendik, İstanbul / TÜRKİYE

- This machine is intended for indoor use only and complies with the **Waste Electrical and Electronic Equipment (WEEE)** Directive.
- This machine has been designed in accordance with **EN ISO 11553-2, EN IEC 60204-1, EN IEC 61000-6-2, EN IEC 61000-6-4, EN 60825-1**.
- The machine is safe when installed, operated and maintained in accordance with this user manual and the applicable regulations.
- The operator and the owner of the machine are responsible for complying with all applicable occupational health and safety requirements.
- If any modifications are made to the machine or occupational health and safety requirements are not observed, Gedik Welding Inc. accepts no responsibility for the machine's safety or CE conformity.



This **Class A** equipment is not suitable for use in residential locations where electrical power is supplied by the public low-voltage supply system.



- This machine is not household waste and must not be disposed of with household waste.
- At the end of its service life or when it is taken out of service, the machine shall be disposed of in accordance with the applicable regulations.
- This machine complies with the requirements of **the WEEE Directive (2012/19/EU)**.

Eco-design Directive

This machine has been designed and manufactured in accordance with the requirements of **Directive 2009/125/EC** establishing a framework for the eco-design of energy-related products.

INTRODUCTION

This machine is a high-technology product that integrate mechanics, optics, motors, and electrical systems. It is characterized by its compact structure, high precision, long service life, aesthetic design, and reasonable cost. Before installing, operating, servicing, or maintaining the machine, all users shall carefully read and fully understand this manual to ensure maximum performance,

To facilitate understanding of this user manual, a number of illustrative figures have been included. These figures provide visual guidance on machine installation and commissioning, assembly procedures, adjustments, routine maintenance, and safety precautions.

Thank you for choosing our product.

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1. INTRODUCTION

1.1 General Information

This user manual has been prepared to ensure the safe and correct operation of the laser welding machine. The laser welding machine is a high-technology product that integrates optical, mechanical, and electrical technologies. It is characterized by its compact design, high precision, long service life, aesthetic appearance, and efficient operation.

To obtain optimum performance from the machine and to ensure that maintenance procedures are carried out correctly, read this user manual carefully before operating the machine. Compliance with the instructions provided in this manual helps prevent potential hazards, minimizes faults and downtime, and enhances the reliability, operational efficiency, and service life of the machine.

This user manual shall be read by all user responsible for the operation, maintenance, or servicing of the laser welding system and shall be kept readily accessible at all times.

1.2 Content

This user manual contains all the information necessary for the safe, correct, and efficient operation of the GeKaLaser laser welding machine. It provides detailed information on the machine's technical specifications, installation and commissioning procedures, operating principles, user interface, basic settings, maintenance procedures, and safety precautions.

This manual is intended for operators, maintenance technicians, and authorized service personnel who are responsible for the operation, maintenance, or servicing of the laser welding system. To facilitate understanding, the manual includes illustrative figures demonstrating key procedures, including machine installation, commissioning, assembly, adjustments, routine maintenance, and safety precautions.

This document applies only to the specified machine model and configurations. Certain sections of this manual may not be applicable to different models, software versions, or customized systems. For the latest information and technical assistance, contact an authorized “GeKaLaser Service Center” or “GeKaLaser Technical Support Department”.

1.3 Intellectual Property Rights

This user manual is the property of “Gedik Kaynak” and is protected by applicable copyright and intellectual property laws. No part of this manual may be reproduced, copied, distributed, published, transmitted, or disclosed to any third party without the prior written consent of “Gedik Kaynak”.

All technical information, drawings, illustrations, photographs, and descriptions contained in this manual are provided solely for the training and information of authorized users. The contents of this document have been prepared specifically for the industrial use of laser welding machines. Any unauthorized reproduction, distribution, modification, or commercial use of this document, in whole or in part, may constitute a violation of applicable intellectual property laws.

All industrial and intellectual property rights relating to this document and its contents are the exclusive property of “Gedik Kaynak”. “Gedik Kaynak” reserves the right to take legal action against any unauthorized use or infringement of these rights.

2. SAFETY INFORMATION

The safety warnings and instructions provided in this section are intended to ensure the correct, safe, and efficient operation of the machine. Read all safety information carefully before operating the machine, and retain this user manual for future reference. Failure to follow the instructions and safety precautions contained in this manual may result in serious personal injury, property damage, or damage to the machine. Compliance with all specified safety instructions is essential to ensure safe operation. All descriptions and illustrations in this manual are based on the actual product. However, photographs and illustrations may differ slightly from the actual appearance of the machine due to lighting conditions, viewing angles, or product improvements. Such differences do not affect the operation or functionality of the machine.

DANGER	Indicates the highest level of hazard. Alerts the user to an emergency and dangerous situation. Strict compliance with all specified instructions and safety measures is mandatory. Failure to follow instructions may result in death or life-threatening injuries.
WARNING	Indicates high level of hazard. Alerts the user to a potentially hazardous situation. If not avoided, serious injury, or significant damage to the machine could be resulted.
CAUTION	Indicates moderate level of hazard. Alerts the user to a potentially hazardous situation. If not avoided, minor or moderate injury, damage to the machine or environmental damage could be resulted.

2.1 General Safety Rules

- Laser welding machines involve hazards such as high temperatures, high-power laser radiation, and electric current. Therefore, they shall be operated only by authorized and trained persons.
- Before operating the equipment, all users shall carefully read this manual and fully comply with all safety instructions contained herein.
- Operation and maintenance of the equipment by untrained personnel is strictly prohibited.
- The operating area shall be restricted to authorized persons only and shall be clearly identified with appropriate warning signs. Unauthorized access to the operating area shall not be permitted.
- To protect against hazards arising from laser radiation, glare, high temperatures, and fumes generated during laser welding operations, the work area shall be adequately ventilated, and unauthorized access shall be prevented by suitable physical barriers.
- During operation, operators shall wear appropriate personal protective equipment (PPE) at all times. Required PPE includes laser safety eyewear, heat-resistant protective gloves, protective clothing, and appropriate safety footwear. Never look directly at the laser beam or the welding process with the naked eye, as direct exposure to laser radiation may result in permanent eye injury or blindness.
- The location and operation of all emergency stop devices shall be known by all personnels.
- Where operators or maintenance personnel are required to work at elevated locations, suitable fixed or mobile access platforms shall be provided. Appropriate lifting or access equipment, such as cranes, mobile elevating work platforms (MEWPs), or other approved lifting systems, shall be used where necessary. Fall protection equipment, including safety harnesses and approved anchorage points, shall be used whenever there is a risk of falling. Unsecured ladders, stools, improvised platforms, or other unsuitable access equipment shall not be used.
- During transportation or lifting operations, approved lifting equipment (such as cranes, hoists, or forklifts) shall be used. Personnel performing lifting operations shall be properly trained and shall strictly follow the applicable lifting instructions and safe lifting procedures.
- Insufficient or uneven lighting may impair the operator's visual perception, resulting in operational errors, loss of control, or accidents. Adequate illumination appropriate to the task shall therefore be provided in all work areas in accordance with applicable lighting requirements. Lighting systems shall be regularly inspected, maintained, and cleaned to ensure continued performance. Where necessary, supplementary local task lighting shall be provided.

- Fumes generated during welding operations may cause respiratory irritation, reduced visibility and, if not properly controlled, may increase the risk of fire. Suitable local exhaust ventilation shall therefore be installed and filtration systems shall be inspected at regular intervals. Appropriate personal protective equipment, including suitable respiratory protection and safety eyewear, shall be provided where required, and workplace cleaning procedures shall be followed to prevent the accumulation of hazardous residues.
- The use of worn or damaged parts may result in machine malfunction and occupational accidents. Therefore, the scheduled preventive maintenance program shall be strictly followed, all components shall be inspected at regular intervals, and any part showing signs of wear or deterioration shall be replaced immediately. Appropriate personal protective equipment (PPE) shall be worn at all times during maintenance operations.
- Imbalance of rotating parts within the laser welding machine may cause excessive vibration, component failure, or the ejection of rotating parts. Such conditions present a serious risk of injury to operators and may result in machine damage or malfunction. All rotating components shall be subjected to periodic dynamic balancing inspections and operated only within the specified speed limits. Emergency stop devices shall remain readily accessible at all times, and appropriate protective guards or barriers shall be installed and maintained. Operators shall receive adequate training regarding the hazards associated with rotating parts, and vibration levels shall be monitored at regular intervals. If abnormal vibration is detected, the machine shall be stopped immediately and shall not be returned to service until the cause has been identified and corrected.
- Carelessness during workpiece loading, positioning, welding parameter setting or laser beam application while operating the laser welding machine may result in burns, mechanical pinch hazards or defective welds. Before initiating any welding operation, verify that all safety systems are functioning correctly and that the machine is in a safe operating condition.
- The machine travel limits are defined by software and hardware limit functions. These limits shall not be modified under any circumstances. During manual movement, low-speed operating modes shall be used and the operator must be careful.
- During programming, ensure that the workpiece is properly positioned and that all machine axes operate within their defined travel limits.
- Before starting the welding process, ensure that all workpieces are securely clamped in the correct position. Welding operations shall be performed only by trained and authorized persons. Operators shall wear appropriate protective equipment, including protective gloves, safety eyewear and welding apron. Operator shall remain clear of the laser processing area before laser emission is initiated. Emergency stop devices shall remain readily accessible at all times. Prior to each operation, all machine safety devices and protective functions shall be inspected.

- The manufacturer and importer accept no liability for any damage, injury, or accidents resulting from failure to follow the instructions provided in this manual.
- The operating voltage is AC 220V/380V, 50/60Hz. Do not operate the machine if the supply voltage is unstable or does not match the specified electrical requirements.

Symbols Used in This Manual	
	Electric Shock Hazard: Located on the electrical control panels, cable entry points and around the maintenance access covers. Do not perform any inspection, maintenance or servicing unless the power supply has been switched "OFF" and the machine has been isolated from the electrical supply.
	Laser Radiation Hazard: Located around the laser emission area, on the machine and at the access doors. Direct exposure of the eyes or skin to the laser beam can cause serious injury.
	Flammable Material and Fire Hazard: Located in areas where flammable materials may be present, such as near gas cylinders. Fire may occur during laser processing.
	General Warning: Used as a general warning symbol in areas requiring caution. It is typically accompanied by explanatory safety information.
	Wear Laser Safety Eyewear: Located in laser processing areas. Direct exposure to the laser beam may cause permanent eye injury or blindness.
	Wear Protective Gloves: Located in areas where contact with hot parts may occur, including workpiece handling areas. Protective gloves shall be worn to reduce the risk of thermal burns.
	Wear Protective Clothing: Operator have to wear appropriate laser-resistant and heat-resistant protective clothing when working in the laser processing area.
	Read the Instruction Manual: Safety and operating instructions contained in this manual shall be read carefully before operating the machine.

2.2 Electrical and Laser Safety

- Electrical connections shall be made only by authorized and qualified technical persons.
- Before switching on the equipment, ensure that the protective earthing (grounding) connection has been correctly installed.
- To prevent the risk of electric shock, disconnect the equipment from the power supply before performing any maintenance.
- During operation, avoid direct or reflected exposure to laser radiation emitted from the laser source.
- Wear laser safety eyewear specifically designed for laser protection. The protective eyewear shall be suitable for the wavelength of the laser being used.
- Laser warning signs shall be installed in clearly visible locations at the entrance to and around the laser-controlled area.
- The system shall be operated only within designated Laser Controlled Areas (LCAs).
- Lasers are classified according to their hazard level as described below.

Class	Description
Class 1	Safe. The laser radiation is fully enclosed within the equipment. Neither direct nor reflected exposure is hazardous.
Class 2	Visible wavelength (400–700 nm). Protection is normally provided by the natural aversion response (blink reflex). Maximum exposure time is 0.25 s.
Class 3R	Caution required. Brief exposure to the eye may present a potential hazard.
Class 3B	Hazardous to the eyes. The risk to the skin is low; however, reflected laser radiation may also be hazardous.
Class 4	Extremely hazardous to the eyes. Presents high risk for eye and skin injury. May also present a fire danger.



This product emits invisible high-power Class 4 laser radiation and a visible Class 2 red aiming laser during welding or cleaning operations. Do not direct the laser processing head toward any object or location other than the workpiece.

2.3 Fire and Environmental Safety

- It is strictly prohibited to perform laser welding operations in areas where flammable or explosive materials are present.
- If hazardous materials such as solvents, gas cylinders or paint are present in the work area, the area shall be made completely safe before to start welding operation.
- Suitable fire-fighting equipment shall be kept readily accessible to respond to potential fire hazards.
- The work area shall be adequately ventilated and an effective fume extraction system shall be provided.
- Cables shall be securely routed and neatly arranged. They shall be kept away from walkways and moving parts to prevent tripping hazards and mechanical damage.
- The welding area shall be kept clean and dry. The floor shall be flat, clean and free from moisture. Slip-resistant flooring or anti-slip mats shall be used. The work area shall be cleaned regularly and any spilled materials shall be removed immediately. Operator shall wear safety footwear with slip-resistant soles (e.g., SRC-rated footwear).

CAUTION



Long-term exposure to electromagnetic fields (EMFs) may present potential health risks. Operator who use the equipment for extended periods shall take appropriate protective measures.

2.4 EMI/EMC Compliance

Laser welding machines may generate electromagnetic fields (EMF) and electromagnetic interference (EMI) during operation. These emissions may present potential risks to both personnel and nearby electronic equipment.

Safety precautions are listed below:

- Verify that the machine is properly grounded before operation. Inadequate grounding may increase electromagnetic emissions and create electromagnetic interference.
- Use only CE-marked equipment. Equipment that complies with applicable standards and provides adequate protection against electromagnetic interference (EMI) shall be used.
- Personnel wearing pacemakers or other active implantable medical devices shall not remain within the operating area unless they have consulted their physician.
- Do not operate sensitive electronic equipment (e.g., measuring instruments, computers or similar devices) in close proximity to the laser welding machines. Electromagnetic interference may affect their performance.
- Electromagnetic field (EMF) exposure levels shall be measured and verified at regular intervals using appropriate measuring instruments.
- The laser welding machine shall be operated only in environments that comply with applicable electromagnetic compatibility (EMC) requirements.
- Ensure that the power supply outlet and protective earth (PE) connection are correctly installed and periodically inspected.
- Do not operate the laser welding machine in the immediate vicinity of sensitive equipment, including medical devices, communication equipment or other electronics.

CAUTION



Improperly routed or unsecured cables may create trip hazards, cause cable damage and increase the risk of fire due to short circuits. Cable routing and integrity shall be verified before operating the equipment.

2.5 Personal Protective Equipment (PPE)

- Personal protective equipment (PPE) shall be worn before starting the welding operation and shall not be removed during the welding operation.
- Safety glasses and protective gloves shall be cleaned after use. Damaged or worn PPE shall be replaced immediately.
- Laser safety eyewear shall not be used if the lenses are scratched, cracked, or degraded by UV exposure.
- Unsuitable clothing (e.g., nylon, synthetic fabrics or loose-fitting clothing) may ignite during welding and cause skin burns. Wear appropriate flame-resistant protective clothing.
- The use of PPE does not replace laser beam safety measures. It serves only as an additional protective measure. Appropriate machine safeguards and environmental safety controls shall also be implemented.
- Where work is performed in high-noise environments, suitable hearing protection (earmuffs or earplugs) shall be worn. For operators exposed to prolonged noise, periodic hearing examinations are recommended.

2.6 Electrostatic Discharge (ESD) Protection

The sensitive electronic components of the laser welding machine are susceptible to voltages generated by electrostatic discharge (ESD). Inadequate flooring, insulating clothing or static charges generated by personnel may result in ESD within the machine, potentially causing hardware damage or in rare cases, fire.

The following precautions shall be observed:

- Install the machine on ESD-compatible flooring and ensure that an appropriate protective grounding system is provided.
- During maintenance, adjustment, or any work involving electronic components, personnel shall wear ESD wrist straps and ESD protective apron.
- Before handling electronic circuits or components, any accumulated electrostatic charge shall be safely discharged.
- Where the ambient relative humidity is very low (particularly less than 30%), the risk of ESD increases. Ambient humidity shall therefore be monitored and maintained within an appropriate range where practicable.

3. MAIN COMPONENTS and THEIR FUNCTIONS

The laser welding machine is an industrial welding system designed to permanently join two or more metal components by means of a high-intensity laser beam. Using a non-contact thermal process, the machine provides highly precise, high-speed, and high-quality welding.

Laser welding is widely used in industries such as automotive manufacturing, aerospace, medical device manufacturing, electronics, tool and die making, and precision manufacturing.

The laser welding machine focuses the generated laser beam onto a small area of the workpiece.

The laser beam:

- Transfers energy to the surface of the workpiece.
- Melts the material and fuses the adjoining edges of the components being joined.
- As the molten material solidifies, produces a homogeneous weld joint.

The focused laser beam enables both spot welding and seam welding. Its extremely narrow heat-affected zone (HAZ) minimizes thermal distortion of the workpiece.



3.1 Fiber Laser Resonator

The fiber laser resonator generates a high-power laser beam at a wavelength of 1080 nm. The beam is characterized by high intensity and coherent, collimated light with a high energy density. The weight and dimensions of the resonator vary depending on the laser power rating.

CAUTION:

Intervention, disassembly or servicing by unauthorized persons is strictly prohibited.

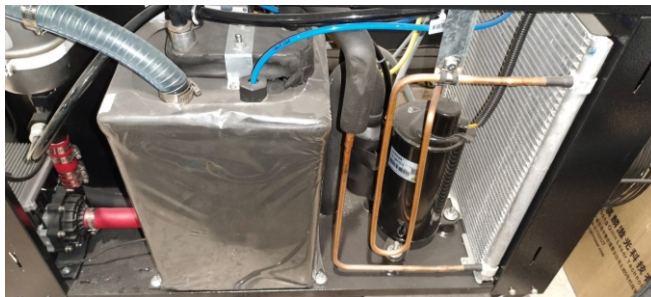


Fiber Laser Resonator

Features	M1500	M2000
Nominal Output Power	1500 W	2000 W
Operating Mode	CW / Modulation	CW / Modulation
Wavelength	1080 ± 5 nm	1080 ± 5 nm
Beam Quality (M ²)	≤ 1.8	≤ 1.8
Power Adjust. Range	2 – 100 %	2 – 100 %
Modulation Frequency	1 – 5000 Hz	1 – 5000 Hz
Output Fiber Diameter	25 µm	25 µm
Efficiency	> 33 %	> 33 %
Cooling & Voltage	Air/Water Cooling, 220 V	Air/Water Cooling, 220 V
Dimensions	340 × 390 × 80 mm	340 × 390 × 80 mm
Control Interface	Bluetooth+Integrated Control	Bluetooth+Integrated Control

3.2 Water Cooling Unit (CHILLER)

During high-power laser welding operations, particularly under continuous or prolonged use, significant heat is generated in the laser welding torch. Excessive heat may lead to degradation of optical components, deformation of the welding torch, and a reduction in weld quality. To prevent such damage, the machine is equipped with a water cooling unit.



The cooling unit incorporates a circulation pump that continuously circulates a specially prepared coolant (mixture of deionized water and antifreeze) through the laser welding torch. This continuous circulation effectively dissipates heat, maintains the welding head within its specified operating temperature range and prevents overheating.

The system automatically monitors and regulates the coolant temperature. During warm ambient conditions, the CHILLER cools the coolant and maintains it within a temperature range of 10 °C to 25 °C. Under cold ambient conditions, the unit heats the coolant to maintain the same operating temperature range. This automatic temperature regulation maintains the coolant at an optimum operating temperature of approximately 25 °C under both hot and cold ambient conditions, thereby ensuring the stable and safe operation of the laser welding machine.

L26.7



L25.3



CAUTION



- Do not operate the laser welding machine unless the cooler is operating properly.
- If the machine will remain out of service for an extended period, drain the coolant from the cooling system and ensure that the system is thoroughly dried.
- Coolant leaks or low-flow faults shall be corrected immediately.
- Do not place any objects around the cooler that could obstruct airflow or ventilation.
- Fill the cooling unit only with clean water free of suspended particles specified by the manufacturer.
- The coolant shall be inspected at least once a month and replaced when necessary.

3.3 Shielding Gas System

The use of shielding gas is mandatory during laser welding operations to prevent oxidation, discoloration and spatter accumulation in the weld area. In addition, a shielding gas system is required to protect and cool the optical lens at the torch nozzle.

For this purpose, high-purity Argon (Ar) or depending on the application, Nitrogen (N₂) shall be used. These inert gases isolate the weld area from the surrounding atmosphere, producing a cleaner, more uniform and higher-quality weld. Do not use any shielding gas other than those specified.

- The system shall be equipped with a suitable pressure regulator to allow adjustment of the shielding gas pressure.
- Regulators with a flow rate indicator graduated in litres per minute (L/min) are not suitable for this system and shall not be used.
- Instead, a pressure regulator with a pressure gauge graduated in bar shall be used.
- During welding, the shielding gas pressure shall be maintained between 2 and 3 bar. This pressure range provides adequate shielding while minimizing unnecessary gas consumption.



Regulators with flow rate indicator graduated in “L/min” are not suitable.



Regulators with pressure gauge graduated in “bar” shall be used.

CAUTION



- Only shielding gases with a purity of 99.99% or higher shall be used.
- Gas cylinders shall be kept in upright position and securely fastened.
- If a gas leak is suspected, it shall be checked using a leak detection solution (soap solution) or an equivalent leak detection method. Never use an open flame.
- When adjusting the pressure regulator, avoid opening the cylinder valve abruptly.

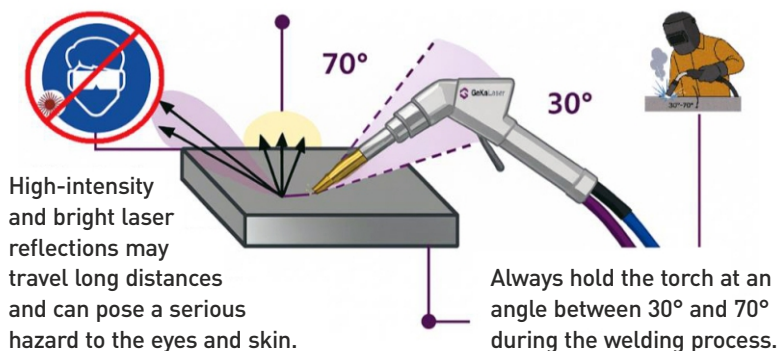
3.4 Welding Torch

The welding torch is the primary component that accurately focuses the laser beam onto the workpiece. During laser welding, the high-energy laser beam is delivered to the surface of the material through the welding torch. The shielding gas supplied through the torch protects the weld zone from atmospheric oxygen and other contaminants. The cooling system maintains the torch at an appropriate operating temperature, enabling safe and reliable operation over extended periods. Weld quality, welding speed and penetration depth of the laser weld largely depend on the performance of the torch head.



Low-intensity laser light reflected at narrow angles may present a hazard, especially to the operator's unprotected eyes. Always wear appropriate laser safety eyewear.

The operator shall keep their eyes at least 50 cm away from the welding point and position themselves behind areas where direct or reflected laser radiation may occur.

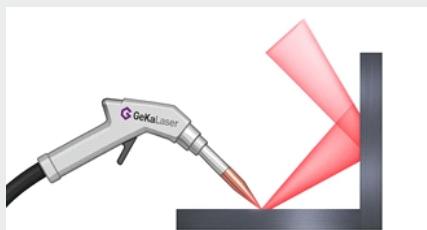


CAUTION



- Do not use a damaged or improperly maintained welding torch, as it may reduce weld quality and cause equipment damage.
- Avoid touching the welding torch during operation and ensure that it is correctly positioned and securely held throughout the welding process.
- The laser beam can cause serious eye injury. Appropriate laser eye protection shall be worn during welding.
- If the cooling system malfunctions, stop using the welding torch immediately.
- Do not stand in front of the weld during the welding process.
- All personnel working within the laser controlled area shall wear all required personal protective equipment (PPE), including the laser safety eyewear supplied with the M1500–M2000 systems, to protect against laser radiation, ultraviolet (UV) radiation, heat, intense light and welding sparks.

CAUTION

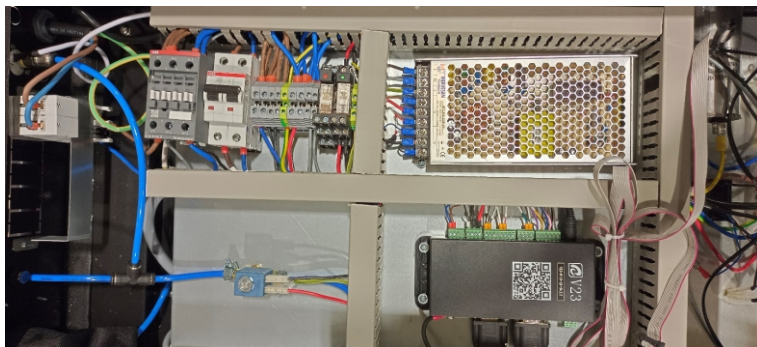


Laser radiation may be reflected from multiple surfaces, including metallic workpiece surfaces during the welding process. Such reflected radiation can be as hazardous as direct laser exposure. Throughout the welding operation, potential beam reflection paths shall be taken into account, the work area shall be enclosed or protected with non-reflective materials and only appropriate laser safety eyewear shall be worn.

3.5 Power Supply and Electrical Control Panel

The power supply and electrical control panel provide and distribute the electrical power required for the safe, stable, and efficient operation of all laser welding machine systems. This assembly consists of two main sections:

- **Power Supply:** Provides the electrical power required by the laser source, cooling system and control module.
- **Electrical Control Panel:** The enclosure that houses protects and manages the machine's electrical components. It contains protective devices and control components such as fuses, relays, contactors and other electrical protection systems.



CAUTION



- Electrical control panel shall be opened and serviced only by authorized persons.
- If loose connections, signs of arcing, a burning odor or evidence of overheating are detected inside the panel, the machine shall be switched off immediately and inspected.
- Interior of the electrical control panel shall be kept free from dust, dirt, and moisture. The proper operation of the ventilation system shall be verified at regular intervals.
- Do not perform any maintenance or servicing unless the machine has been disconnected from the power supply.
- Unauthorized modifications or servicing are strictly prohibited. Only authorized services shall perform maintenance and repairs.

3.6 Control Panel / User Interface

The control panel is the central user interface through which the operator controls the laser welding machine, configures operating parameters and monitors the system status. It provides access to all machine functions and allows precise adjustment of welding parameters, including laser power, pulse duration, pulse frequency, focal position and shielding gas flow.



3.7 Wire Feeder and Wire Feeding Line

For laser welding applications requiring filler material, the wire feeder unit provides controlled and continuous delivery of the filler wire to the weld zone. The system is driven by a servo motor or stepper motor mechanism and is optimized to ensure smooth and consistent wire feeding.



Wire feeding line transfers the filler wire from the wire feeder to the nozzle of the welding torch. It consists of a flexible outer hose reinforced with an internal steel spiral, providing excellent resistance to bending while allowing

smooth, low-friction wire feeding. The wire feed hose is available in two sizes, suitable for filler wire diameters of 0.8–1.0 mm and 1.2–1.6 mm.

- V-grooved or U-grooved wire feeding rollers shall be selected according to the filler wire diameter (0.8 mm, 1.0 mm, 1.2 mm or 1.6 mm).
- V-grooved wire feeding rollers shall be used for carbon steel (e.g., cold-rolled steel), stainless steel and similar filler wires.
- U-grooved wire feeding rollers shall be used for aluminum filler wires.

3.8 Ground Cable and Ground Clamp

During laser welding process, the ground cable and ground clamp play a critical role in completing the electrical circuit. They provide a secure, low-resistance electrical connection between the workpiece and the power source, ensuring a stable electrical path throughout the welding process. This system is particularly important when welding electrically conductive materials, where a reliable current path is required to ensure stable and consistent welding performance.



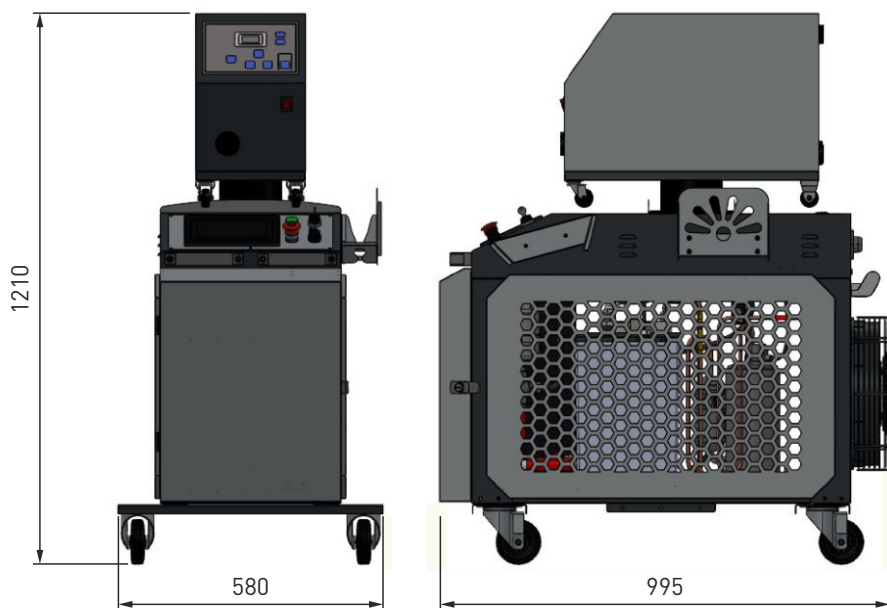
CAUTION



- **Danger:** If the ground clamp is not securely attached, arcing or spark generation may occur. This may result in poor weld quality and create a fire hazard.

- **Caution:** The ground cable shall not be confused with the protective earth (PE) conductor. The ground cable is a part of the welding electrical circuit, whereas the protective earth serves a different safety function. The ground clamp shall be attached to the workpiece or work fixture within the welding area.
- **Warning:** If the contact surfaces of the ground clamp are oxidized, dirty, or corroded, electrical contact quality will be reduced and as a result, unstable arcing or system faults may occur during welding process.
- **Caution:** Do not walk on the ground cable. Do not pinch it beneath the welding table or allow it to come into contact with sharp objects.
- **Caution:** Since laser emission is initiated when the filler wire makes contact with the workpiece. Consequently, ensure that unintentional contacts do not occur.

3.9 Dimensions



4. INSTALLATION and OPERATION

The following procedures shall be observed to ensure the safe, efficient and reliable installation and operation of the laser welding machine. Installation shall be carried out only by authorized technical persons.

4.1 Physical Installation

- The machine shall be unpacked by removing all transportation securing components and placed on a flat and stable surface.
- The welding torch, ground cable and clamp, shielding gas hoses, and wire feed hose shall be securely connected to their connection points.
- **WARNING:** Improper positioning or installation of the machine or workpiece may cause tipping, resulting in operator injury, damage to nearby equipment and interruption of operation. **Therefore, the machine and workpieces shall be placed on a stable, flat and solid surface. For machines containing casters, wheels equipped with locking brakes shall be used, and any components that may tip over shall be securely fastened.**

4.2 Electrical Connections

- The machine shall be connected to a properly grounded and protected electrical supply.
- The supply voltage, current rating and phase configuration shall comply with the values specified on the manufacturer's rating plate.
- Before making any electrical connections, ensure that the main disconnect switch is in "OFF" position.
- An appropriate electrical distribution panel and overcurrent protection device (fuse or circuit breaker) shall be provided.

4.3 Gas Connections

The use of shielding gas in laser welding machines is essential to protect the weld zone from atmospheric oxygen, thereby preventing weld defects such as discoloration, oxidation and excessive spatter. It also provides protection for sensitive components, including the optical lens and welding torch nozzle.

- Gas cylinder shall be secured and fixed in upright position.
- Do not expose the gas cylinder to direct sunlight or heat sources.

- A pressure regulator with a pressure gauge graduated in “Bar” shall be used. Regulators with a flow rate indicator graduated in “L/min” are not suitable and shall not be used.



Regulators with flow rate indicator graduated in “L/min” are not suitable.



Regulators with pressure gauge graduated in “bar” shall be used.

- Connect a suitable gas hose between the regulator outlet and “GAS IN” port.
- The gas hose shall be suitable for the type of gas used and shall be in good condition, flexible and free from kinks, crushing or cracks.
- After completing all connections, check for gas leaks using a soap solution or a suitable leak detection spray.
- If bubbles are observed, the connection is leaking and shall be retightened or the defective component shall be replaced.
- During welding, the shielding gas pressure shall be maintained between 2 and 3 bar.

CAUTION



- Supplying shielding gas without a pressure regulator may damage components such as the welding torch and optical lens and may even create a fire hazard.
- Pressurized components of the shielding gas system shall be connected and serviced only by authorized persons.
- Before making any gas connections, ensure that all electrical power has been disconnected.
- If a gas leak is detected, stop the system immediately, ventilate the area and do not restart the machine until the necessary inspection and maintenance have been completed.

4.4 Cooling Unit

During laser welding operations, particularly in high-power applications, the welding torch head and optical lens assembly may become excessively hot. Excessive heat may cause permanent damage to these components and reduce weld quality. Therefore, the cooling unit is essential for ensuring the safe and reliable operation of the system.

- The permissible operating ambient temperature for the laser is 10 °C to 35°C.
- The cooling system is factory-set to automatically maintain the cooling water temperature at 25 °C.
- Excessively low temperatures may cause to freeze the cooling water inside the laser and the system to malfunction.
- Fill the cooling tank with distilled water according to its capacity. Under normal operating conditions, the total amount of additives shall not exceed 10% to 20% of the tank capacity. For example, if the cooling tank capacity is 100 L, the total amount of additives shall not exceed 20 L. Do not use alkaline mineral water under any circumstances.
- Before adding distilled water or any coolant additive, it is recommended to consult the manufacturer of the cooler.
- During winter, if the ambient temperature is expected to fall below freezing and the laser water piping is exposed to outdoor conditions, it is recommended that the cooler shall be kept running. For laser systems rated at 2 kW or higher, ensure that the laser 24 V power supply remains switched on while the cooler is operating.

- If the ambient temperature remains between 10°C and 40°C, antifreeze is not required. When operating the machine during the summer months, drain the antifreeze from the cooling system and refill it with distilled water.
- If the laser welding machine will remain out of service for an extended period during winter, completely drain any residual water from the laser cooling circuit.
- Before transporting or servicing the laser in low-temperature conditions, ensure that all residual water has been drained from the laser cooling circuit.
- For laser systems rated at 2 kW or higher, ensure that the 24 V power supply is switched on before draining the cooling circuit. Otherwise, the solenoid valve in the laser cooling circuit will not operate, preventing complete drainage.
- Replace the distilled water in the cooler every 180 days.
- When connecting the cooler to the laser source, before pressing the laser source ON button, verify that the connection hoses are free of water. This is extremely important; otherwise, the laser source may be damaged.

4.5 Ventilation and Exhaust Requirements

Gases, fumes, and airborne particles generated during laser welding operations shall be effectively controlled to protect operator health and ensure a safe working environment. Therefore, suitable ventilation and exhaust systems shall be installed.

During laser welding, coatings, oxides and other chemical substances on metal surfaces may vaporize and generate hazardous gases and fumes. Accumulation of these contaminants may cause respiratory disorders as well as eye and skin irritation.

- Fumes and gases generated in the welding area shall be extracted directly by the exhaust system.
- For maximum efficiency, the exhaust inlet should be installed as close as possible to the welding area.
- The exhaust system shall be equipped with suitable filters (e.g., HEPA and activated carbon filters) to capture hazardous particulates and gases.
- The exhaust system shall discharge directly to the outside atmosphere. Air recirculation within enclosed work areas shall not be permitted.
- General workplace ventilation shall provide a continuous supply of fresh air, particularly in enclosed areas.
- The ventilation and exhaust systems shall be inspected regularly and filters shall be replaced at the recommended service intervals.
- If reduced extraction performance or filter blockage is detected, corrective action shall be taken immediately.
- Any malfunction of the ventilation or exhaust system shall be reported to authorized service personnel without delay.

CAUTION



- Keep your head out of the welding fumes.
- Always perform welding in a well-ventilated area.
- Appropriate personal protective equipment (PPE), including suitable respiratory protective equipment (RPE) shall be worn to protect against hazardous fumes and airborne contaminants.

5. OPERATING PARAMETERS and MODES

The quality and performance of the laser welding process depend on the selection of appropriate operating parameters and the use of the correct welding mode. This section describes the operating parameters and welding modes available on the laser welding machine.

5.1 Welding Modes (CW and Pulsed)

Continuous Wave (CW) Mode:

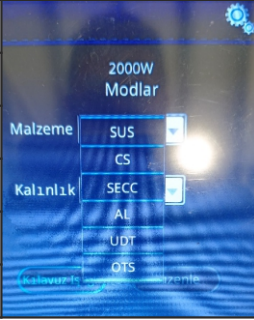
- The laser beam is emitted continuously.
- Suitable for thick materials and applications requiring high heat input.
- Provides deep weld penetration through continuous energy delivery to the weld zone.

Pulsed Mode:

- The laser beam is emitted in a series of pulses at predetermined intervals.
- Suitable for thin materials and precision welding applications.
- Minimizes material distortion by reducing the heat input.

5.2 Parameter Settings by Material Type

- **Material Type:** Welding parameters such as laser power, welding speed, focal position, and pulse settings shall be adjusted according to the material being welded (e.g., carbon steel, aluminum, or stainless steel).

SUS	Stainless Steel	
CS	Carbon Steel	
SECC	Electro-Galvanized Steel	
AL	Aluminum	
UDT	Cold-Drawn Steel	
OTS	Hot-Rolled Steel Sheet (Uncoated)	

- **Material Thickness:** As the material thickness increases, higher laser power and longer processing time are generally required, while the welding speed is reduced.



This section is used to configure the laser welding parameters after selecting the material type and thickness. The parameter settings may vary depending on the application requirements and the operator's experience. When the "EDIT" button is selected, the parameter setting screen for the selected material type and thickness is displayed.



The parameter setting screen consists of three main sections in which the material type and thickness are configured before starting the laser welding process.

5.2.1 Laser Control

The Laser Control screen located on the left side of the touchscreen interface, contains three main parameter settings: Power, Frequency and Duty Cycle.

Power (W): The laser power setting depends on the type and thickness of the material being welded. As an initial reference, a power setting of approximately 60% may be used for aluminum, while 20% is generally suitable for stainless steel and carbon steel. But these values may be changed according to the operator's experience, skill level and the specific welding application.

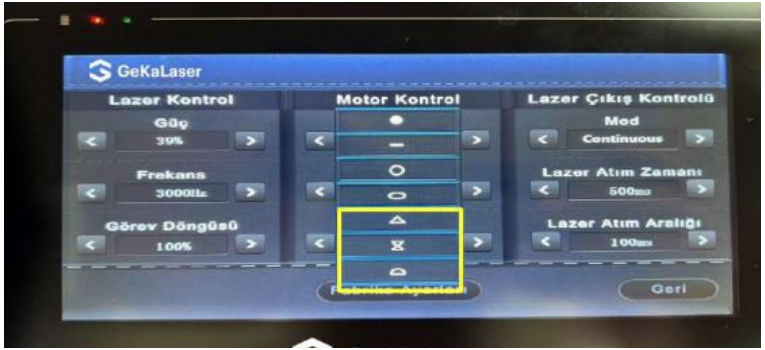
Frequency (Hz): This parameter controls the operating frequency of the fiber laser source. As the frequency increases, the laser emits pulses more frequently with lower energy per pulse, allowing heat to be distributed more evenly and improving process control. **Modification of this parameter by unauthorized persons is strictly prohibited.**

Duty Cycle (%): This parameter controls the duty cycle of the fiber laser source and affects the laser pulse characteristics. **Modification of this parameter by unauthorized personnel is strictly prohibited.**

5.2.2. Motor Control

The motor control screen located in the center of the touchscreen interface, consists of three main settings: Mode, Galvanometer Frequency and Galvanometer Width.

Mode:The operating mode determines how the galvanometer scanning system controls the movement of the laser beam. The machine provides seven different operating modes, each corresponding to a different laser scanning pattern. Triangle, Hourglass and Semi-Circle provide the most stable welding performance. The appropriate mode should be selected according to the required weld quality, welding position, joint geometry and material type.



Galvanometer Frequency: This parameter determines how quickly the laser beam is scanned over the selected pattern by the galvanometer motors. A nominal frequency range of 8–14 Hz is recommended.

As the galvanometer frequency decreases, the oscillation amplitude of the scanning motion increases; as the frequency increases, the oscillation amplitude decreases. This parameter should be adjusted in conjunction with the Galvanometer Width setting. Different values may be selected depending on the required weld quality, welding position, joint geometry, and material type.

Galvanometer Width: This parameter determines the width of the area over which the laser beam is scanned across the weld zone.

- In laser welding applications using filler wire, it is adjusted to achieve the desired weld bead width.
- This setting generally ranges from 0.1 mm to 3.6 mm.
- In laser welding applications using filler wire, the galvanometer width may be increased up to max. 3.6 mm.
- The Galvanometer Width shall be adjusted to ensure proper coordination with the Galvanometer Frequency.
- The width setting shall be selected according to the material type, material thickness and thermal sensitivity of the workpiece.
- The optimum width setting shall be determined through preliminary test welds and shall be selected based on the specific application rather than using fixed values.

CAUTION



Galvanometer Width greater than 3.6 mm is not recommended, as it may cause the welding torch nozzle to overheat.

5.2.3. Laser Output Control

Laser Output Control screen, located on the left side of the touchscreen interface, consists of three main settings: Mode, Laser Pulse Duration and Laser Pulse Interval.

A) Mode: This setting determines whether the laser operates in “Continuous Wave (CW)” mode or “Pulsed” mode.

Continuous Wave (CW): Laser emits a continuous beam at a constant power level. This mode is suitable for welding thicker materials and applications requiring high heat input.

Pulsed: Laser emits short pulses at predetermined intervals. This mode is suitable for precision welding applications and for processes where reduced heat input and minimal material distortion are required.



B) Laser Pulse Duration: This parameter defines the duration of each laser pulse. It determines how long the laser remains active during a single pulse, expressed in milliseconds. After the welding torch trigger is pressed, the laser emission will automatically stop when the specified pulse duration has elapsed.

Note: The Laser Pulse Duration shall be configured in accordance with the Laser Pulse Interval. Otherwise, spot welding operation cannot be performed correctly.



C) Laser Pulse Interval: This parameter defines the time interval between two consecutive laser pulses. It is used in spot welding applications to determine the delay before the next laser pulse is emitted. Used to set the delay time in milliseconds, before laser welding starts. Specifically, it defines the time interval between pressing the torch trigger and the automatic restart of the welding process following the initial laser pulse.



Informations:

- The settings under Laser Control Settings may vary depending on the experience and expertise of the operator.
- To achieve optimum welding efficiency and quality, do not modify the recommended parameter settings unless authorized to do so.
- Individual parameter sets can be configured and stored in the machine memory for different material types and thicknesses. Once saved, the appropriate parameter set can be recalled without reconfiguration by simply selecting the corresponding material type and thickness before starting the welding process.
- Previously saved parameter settings may no longer be suitable due to variations in material quality. Always perform a test weld before production and verify the parameter settings at regular intervals.
- Ensure that no person is positioned in front of, or passes through, the torch or the laser beam path during the welding process.

5.3 System Start-Up

- Ensure that the Emergency Stop button is in the "OFF" position.



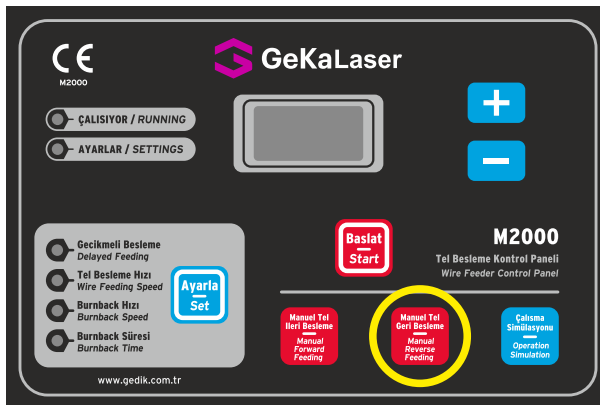
- Before activating the machine, switch the water cooling unit to the “ON” (I) position. To switch it off, turn it to the “OFF” (O) position. Start the cooling unit and allow the coolant temperature to decrease to approximately 25°C in summer or to reach approximately 25°C in winter before operating the system.
- Ensure that the laser is disabled, then turn the System Key Switch (1) to the “ON” position.



- After the “GEKALASER” startup screen appears, turn the Laser Key Switch (2) to the “ON” position. The system is then ready for parameter setting.



- Install the appropriate filler wire and wire spool in the wire feeder according to the material to be welded. Then operate the wire feed motor until the filler wire protrudes from the torch tip.



- Set the welding focal position. Position the nozzle approximately 70 mm from the workpiece for aluminum and approximately 75 mm for stainless steel and carbon steel.
- After completing all torch connections, adjust the Red Laser Position. The red laser beam emitted from the torch shall be aligned precisely with the filler wire. If the laser beam is not aligned with the filler wire, the wire will not be heated sufficiently during welding, resulting in incomplete melting and unsuccessful weld formation.
- Adjust the outlet pressure of the connected high-purity argon or nitrogen shielding gas to 2–3 bar. This pressure is generally sufficient for welding and may be increased or decreased depending on the material being welded.
- After switching the laser to the “ON” position, activate the shielding gas supply. Verify that the gas is flowing properly before starting the welding process.
- If shielding gas can be heard flowing from the welding torch, connect the work clamp to the workpiece and press the torch trigger once. This will stop the gas flow.

Note: When the gas supply is activated, shielding gas will continue to flow until the work clamp is connected to the workpiece.

- If the LASER indicator is “OFF”, no laser beam will be emitted from the torch and welding cannot be performed. Tap the LASER field once to switch it to “LASER ON”.
- If the GAS indicator is “OFF”, no shielding gas will flow through the torch and welding cannot be performed. Tap the GAS field once to switch it to “GAS ON” and activate the gas supply.
- If the WIRE FEED indicator is “OFF”, no filler wire will be fed through the torch and welding cannot be performed. Tap the WIRE FEED field once to switch it to “WIRE FEED ON” and enable wire feeding.



- Before starting the welding process, configure the POWER, MODE, GALVANOMETER FREQUENCY, and GALVANOMETER WIDTH settings according to the material being welded.

Note: Before production welding, it is recommended to perform trial welds on a sample of the same material to determine the optimum welding parameters.



- Connect the work clamp securely to the workpiece before starting the welding process.
- Press the torch trigger to start the welding process.

CAUTION



- Ensure that no person is positioned in front of the welding torch or the laser beam and passes through their path during the welding process.
- Do not keep any flammable or combustible materials in the welding area.
- Set the LASER control to the "ON" position only while welding is being performed. After the welding process is complete, return immediately the LASER control to the "OFF" position.

6. MAINTENANCE and CLEANING

Regular maintenance and cleaning are essential to ensure the long-term, efficient and safe operation of the laser welding machine. At the end of each working day (with the machine switched OFF) remove dust from the electrical cabinet, wire feeder and all external surfaces and components using dry compressed air applied from a safe distance. This helps prevent overheating, electrical arcing and electrical connection problems caused by dust accumulation.

Do not direct compressed air into the welding torch under any circumstances. The torch may contain sensitive optical and electronic components that could be damaged. In addition, inspect the air filters and cooling system at regular intervals and clean them as necessary. Clean the machine enclosure using a damp, lint-free cloth to remove dirt and oil residues. Maintenance shall be performed only by authorized and trained persons in accordance with the manufacturer's instructions.

- Perform cleaning only when the machine is switched OFF.
- Cleaning is recommended at the end of each working day.
- Clean the electrical cabinet, wire feeder and all external surfaces using dry compressed air applied from a safe distance.
- Never direct compressed air into the welding torch.
- Inspect and clean the air filters and cooling system at regular intervals.
- Wipe the machine enclosure with a damp, lint-free cloth.
- Maintenance shall be carried out only by authorized and trained persons.
- Follow the manufacturer's operating and safety instructions during all cleaning and maintenance procedures.

Lens Inspection and Replacement:

At the end of each working day remove, inspect, and reinstall the protective lenses. Before removing the protective lenses, ensure that your hands are clean.

1 - Inspect the first protective lens at the end of each welding operation.

2 - Inspect the second protective lens at the end of each working day.

If any burrs, dust, dirt, contamination or damage are found on either protective lens, do not continue welding. Replace the contaminated or damaged lens without touching its optical surfaces.

If a reduction in welding power is observed, inspect the protective lenses immediately. Do not increase the laser power before performing this inspection.

A damaged or contaminated protective lens may cause the laser beam to be reflected back into the optical system, resulting in damage to the focusing and collimating lenses. Continued operation with damaged optics may subsequently damage the QBH connector lens and the crystal located behind it, leading to costly repairs and machine downtime. For this reason, the protective lenses shall be inspected regularly and replaced whenever contamination or damage is detected.



Winter Maintenance and Low-Temperature Precautions for Fiber Laser Systems:

Due to the precision and advanced design of fiber laser systems, improper operation at low ambient temperatures may result in serious equipment damage. Particularly during freezing winter conditions, special attention shall be given to equipment maintenance.

To ensure safe operation and maximize the service life of the fiber laser system, observe the following precautions:

The permissible ambient operating temperature for the laser system is 10 °C to 35 °C. Operation outside this temperature range, particularly at low temperatures, may cause to freeze the cooling water inside the laser system, resulting malfunction and possible equipment damage.

Cooling System and Freeze Protection:

Add distilled water to the coolant reservoir in accordance with the cooling unit manufacturer's recommendations. Under normal operating conditions, the amount of distilled water should typically be 10% to 20% of the reservoir capacity.

Example: For a 100 L coolant reservoir, a maximum of 20 L of distilled water is recommended.

- Do not use alkaline mineral water under any circumstances.
- Before adding distilled water, follow the recommendations provided by the cooling unit manufacturer. If specified by the manufacturer, purified water may also be used.

Precautions for Freezing Nighttime Temperatures:

- If the laser cooling water lines are exposed to outdoor conditions, it is recommended that the cooling unit remain powered on during freezing nights.
- For laser systems with an output power of 2 kW or higher, ensure that the laser 24 V power switch remains ON while the cooling unit is operating. Otherwise, the cooling water may not drain properly from the cooling system.

Warning Codes and Descriptions:

Codes	Descriptions
E1	Low temperature sensor error
E2	Compressor / Cooling system error
E3	Poor cooling / Low refrigerant (fluorine) pressure
E4	Phase loss / Phase unbalance
E5	Water pump flow error
E6	Water pump overload error
E7	Low refrigerant (fluorine) pressure
E8	Low-water temperature alarm
E9	Sensor connection error at normal temperature
E10	No water flow / Critical flow rate
E11	Heater failure or flow setting error
E12	Insufficient water flow at normal temperature

Important Notes:

Due to the unique design of the fiber laser system, improper operation at low ambient temperatures may cause severe damage to internal components. Therefore, particular care shall be taken when maintaining and operating the fiber laser during freezing winter conditions.

To protect the laser equipment and maximize its service life, observe the following recommendations:

- The recommended ambient operating temperature for the laser system is 10°C to 35°C.
- At low ambient temperatures, fiber laser components may be damaged due to freezing. If the ambient temperature is between 10°C and 40°C, the use of antifreeze is not required. During summer operation, drain the antifreeze from the cooling system and refill it with purified water.
- Do not use alkaline or mineral water.
- Fill the cooling system with liquid equivalent to 10% to 20% of the coolant reservoir capacity. The chiller reservoir capacity is 13 L. During winter, use approximately 2–3 L of antifreeze and 10 L of purified water. During summer, antifreeze is not required; 13 L of purified water is sufficient.
- If the cooling water lines are exposed to outdoor conditions during freezing nights, do not switch off the cooling unit. If the system will remain out of service for an extended period, ensure that all residual water has been drained from the laser cooling water lines.
- If the laser system must be transported or serviced in low-temperature conditions, completely drain all residual water from the laser cooling circuit before transportation or maintenance.
- For laser systems with an output power exceeding 2 kW, ensure that the 24 V power switch remains ON while the cooling unit is operating.
- If the equipment will remain out of service throughout the winter, completely drain all water from the cooling circuit.
- Replace the purified water in the cooling unit every four months.
- During draining, the 24 V power supply must remain ON to allow the solenoid valve to operate properly.
- Use only high-purity nitrogen or high-purity argon as the shielding gas during welding. Failure to do so may result in damage to the protective lens.
- Before replacing the protective lens, wash and dry your hands thoroughly, and clean the welding head with alcohol.
- Never point the laser welding torch away from the workpiece. Doing so may create a serious safety hazard and increase the risk of fire.

GARANTİ BELGESİ / WARRANTY CERTIFICATE

UYARI: Garanti Belgesinin geçerli olabilmesi için her iki kopyanın da **Satın Alan Firma** ve **Yetkili Servis** tarafından imzalanması gerekmektedir. Garanti belgesi imzalanmadan önce her iki kopya üzerindeki makine seri numaralarının aynı olduğunu kontrol ediniz.

WARNING: For the Warranty Certificate to be valid, both copies must be signed by the Purchasing Company and the Authorized Service. Before signing the warranty certificate, please ensure that the machine serial numbers on both copies are identical.

MAKİNE BİLGİLERİ / MACHINE INFORMATION:

Marka / Brand : **GeKaLaser**

Model / Model : Seri No. / Serial No.:

TÜKETİCİ BİLGİLERİ / CUSTOMER INFORMATION:

Yetkili Ad-Soyad :
Authorized Person Name-Surname

Firma / Adres :
Company / Address

İlçe / District: İl / City:

Telefon :
Telephone

E-posta Adresi : @
E-mail Address

İmza ve Kaşe
Signature and Stamp

SERVİS BİLGİLERİ / SERVICE INFORMATION:

Yetkili Servisin Adı :
Name of Authorized Service

Kurulumu Yapan Ad-Soyad :
Installer Name-Surname

Kurulum Tarihi : / /
Installation Date

Garanti Başlangıç Tarihi : / /
Warranty Start Date

Garanti Bitiş Tarihi : / /
Warranty Expiry Date

İmza ve Kaşe
Signature and Stamp



GARANTİ ŞARTLARI

- i. Garanti süresi, kaynak makinesinin teslim tarihinden itibaren başlar ve 2 (iki) yıldır.

Kaynak makinesinin garanti süresi içerisinde arızalanması durumunda tamirde geçen süre garanti süresine eklenir. Kaynak makinesinin tamir süresi en fazla 20 iş günüdür. Bu süre, kaynak makinesinin servis istasyonuna, servis istasyonunun olmaması durumunda sırası ile kaynak makinesinin satıcısı, bayisi, acentesi, temsilciliği, ithalatçısı veya imalatçısından birine teslim edildiği tarihten itibaren başlar.
- ii. Kaynak makinesinin; teslim tarihinden itibaren garanti süresi içinde kalmak kaydı ile iki yıl içerisinde, aynı arızayı üçten fazla tekrarlaması veya farklı arızaların beşten fazla ortaya çıkması sonucu, maldan yararlanamamanın süreklilik kazanması, tamir için gereken azami sürenin aşılması, servis istasyonunun mevcut olmaması halinde sırası ile satıcı, bayii, acentesi, temsilciliği, ithalatçısı veya imalatçısından birinin düzenleyeceği raporla, arızasının tamininin mümkün bulunmadığı belirlenmesi durumlarında, ücretsiz olarak değiştirme işlemi yapılacaktır.
- iii. Kaynak makinesinin kullanım kılavuzunda yer alan hususlara aykırı kullanılmasından kaynaklanan arızalar garanti kapsamı dışındadır.
- iv. Garanti Belgesi ile ilgili olarak çıkabilecek sorunlar için Bilim, Sanayi ve Teknoloji Bakanlığı, Tüketicinin ve Rekabetin Korunması Genel Müdürlüğü'ne başvurulabilir. **Gedik Kaynak Sanayi ve Ticaret A.Ş.**'nin verdiği garanti, münhasıran ürettiği makinelerin yapımında kullanılan parçaların malzeme ve işçilik kusurunu **Gedik Kaynak Sanayi ve Ticaret A.Ş.** tarafından da kabul edilecek teknik bir heyetçe tespit edilmesi halinde söz konusudur. Söz konusu garanti, kullanım esnasında sarf edilen malzemeleri (ışae ve kaynak penseleri, kontak meme, nozul, torç spirali, tel yollukları, tel sürme makarası, ampul, sigorta vb.) kapsamaz, bu sarf malzemeleri ile kaynak malzemeleri garanti kapsamı dışındadır.
- v. Garanti kapsamındaki ürünlerde herhangi bir kusurun ortaya çıkması halinde müşteri veya kullanıcı derhal ve yazılı olarak **Gedik Kaynak Sanayi ve Ticaret A.Ş.**'ye arızalanan makinenin arızasını, makinenin adını, seri numarasını, fatura tarihini ve fatura eden firmanın adını bildirmek zorundadır. **Gedik Kaynak Sanayi ve Ticaret A.Ş.** kendisi için en uygun şekilde, ya kendi fabrikasında, ya müşterinin atölyesinde ya da yetkili satış sonrası servisin atölyesinde makinenin taminini bedelsiz olarak yapar veya yaptırır. Müşterinin yukarıda belirtilen belgeleri göstermemesi halinde ilgili makinenin kendi deposundan çıktığı tarihi baz alarak 15 aylık bir süreyle garanti kapsamında sayar.
- vi. **Gedik Kaynak Sanayi ve Ticaret A.Ş.**'nin yukarıda belirtilen, garanti kapsamındaki ürünlerin kusurlu olması halinde bedelsiz tamiri dışında, makinelere meydana gelebilecek arızalar yüzünden oluşabilecek iş kaybı veya imalat kaybı gibi konularda herhangi bir sorumluluğu söz konusu değildir.
- vii. Makinenin, kullanım kılavuzunda belirtilen ortamlara uygun olmayan bir ortamda çalıştırılması, uygun olmayan şartlarda depolanması, **Gedik Kaynak Sanayi ve Ticaret A.Ş.** markası, aksesuarı ve sarf malzemeleri dışında aksesuar ve sarf malzemeleri kullanılması ve makinenin müşteri tarafından tamir edilmeye çalışılması hallerinde **Gedik Kaynak Sanayi ve Ticaret A.Ş.**'nin garantisi geçersiz olacaktır.

WARRANTY CONDITIONS

- i. *The warranty period starts from the delivery date of the welding machine and is valid for 2 (two) years.*

In the event of a malfunction during the warranty period, the time spent for repair shall be added to the warranty period. The maximum repair period for the welding machine is 20 business days. This period starts from the date the welding machine is delivered to the service station or, if no service station is available, to one of the following respectively: seller, dealer, agency, representative, importer, or manufacturer.

If the welding machine fails during the warranty period due to material defects, workmanship defects, or assembly errors, it shall be repaired free of charge without claiming any labor costs, replacement part costs, or any other fees under any name.
- ii. *Provided that the welding machine remains within the warranty period from the date of delivery, if within two years the same malfunction occurs more than three times or different malfunctions occur more than five times, causing continuous inability to benefit from the product; if the maximum repair period is exceeded; or if it is determined through a report issued respectively by the seller, dealer, agency, representative, importer, or manufacturer that the malfunction cannot be repaired in cases where no service station is available, the product shall be replaced free of charge.*
- iii. *Malfunctions resulting from use contrary to the instructions specified in the welding machine user manual are not covered under warranty.*
- iv. *For issues arising regarding the Warranty Certificate, applications may be submitted to the Ministry of Science, Industry and Technology, General Directorate for Consumer and Competition Protection. The warranty provided by **Gedik Welding Industry and Trade Inc.** is exclusively valid if a technical committee accepted by **Gedik Welding Industry and Trade Inc.** determines material or workmanship defects in parts used in the manufacture of its machines. This warranty does not cover consumable materials used during operation (ground clamps and welding holders, contact tips, nozzles, torch liners, wire guides, wire feed rollers, bulbs, fuses, etc.). Such consumables and welding materials are excluded from warranty coverage.*
- v. *If any defect occurs in products under warranty, the customer or user must immediately notify **Gedik Welding Industry and Trade Inc.** in writing about the malfunction of the machine, including the machine name, serial number, invoice date, and the name of the invoicing company. **Gedik Welding Industry and Trade Inc.**, at its own discretion, may repair the machine free of charge either at its own factory, at the customer's workshop, or at an authorized after-sales service workshop. If the customer fails to provide the documents mentioned above, a warranty period of 15 months shall be considered, based on the date the machine left the company warehouse.*
- vi. *Apart from free repair of defective products covered under warranty as stated above, **Gedik Welding Industry and Trade Inc.** shall bear no responsibility for any work loss, production loss, or any damages resulting from machine failures.*
- vii. *The warranty provided by **Gedik Welding Industry and Trade Inc.** shall become invalid if the machine is operated in environments unsuitable for the conditions specified in the user manual, stored under improper conditions, used with accessories or consumables other than **Gedik Welding Industry and Trade Inc.** branded products, or if repair attempts are made by the customer.*



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