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QUASAR

Mod. **QUASAR** Cod. C306800
Mod. **QUASAR PLUS** Cod. C306810



Zhermack®
TECHNICAL

Maintenance and use manual

XM1801000
Rev. 12/07

OPTICAL WELDING MACHINE

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GENERAL INDEX

INTRODUCTION — CH. 1

Pag. 7	**1.1**	How to read and use the manual
Pag. 8	**1.2**	Terminology and symbols

GENERAL INFORMATIONS — CH. 2

Pag. 9	**2.1**	Responsibility
Pag. 9	**2.2**	Warranty: general instruction
Pag. 9	**2.3**	Authorized personnel
Pag. 10	**2.4**	General safety regulations

DESCRIPTION OF THE MACHINE — CH. 3

Pag. 12	**3.1**	General description of the machine
Pag. 12	**3.2**	Table of the components
Pag. 13	3.2.1	Description of the components
Pag. 13	3.2.2	Operating summary
Pag. 13	**3.3**	Identification data
Pag. 14	3.3.1	On-machine labels and symbols

TECHNICAL CHARACTERISTICS — CH. 4

Pag. 15	**4.1**	Technical characteristics and operating start
Pag. 16	**4.2**	Technical Data
Pag. 16	4.2.1	Weight and overall dimensions
Pag. 16	4.2.2	Noise levels

TRANSPORT AND MOUNTING — CH. 5

Pag. 17	**5.1**	Warning
Pag. 17	**5.2**	Packing and unpacking
Pag. 18	**5.3**	Transport and mounting
Pag. 19	**5.4**	Elimination / Dismantling

INSTALLATION AND FIRST-TIME USE — CH. 6

Pag. 20	**6.1**	Warnings and precautions
Pag. 20	**6.2**	Permitted ambient conditions
Pag. 20	**6.3**	Required work space
Pag. 21	6.3.1	Worktops
Pag. 21	**6.4**	Connecting up to the power supply
Pag. 22	**6.5**	Starting up the machine
Pag. 23	**6.6**	Purpose of the machine
Pag. 23	6.6.1	Applications
Pag. 24	6.6.2	Examples of use
Pag. 24	**6.7**	Improper and forbidden use

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USING THE MACHINE CH. 7

Pag. 25 **7.1** Warning
Pag. 25 **7.2** Safety system
Pag. 25 **7.3** Setting of the models to weld
Pag. 27 **7.4** Welding procedure

DESCRIPTION OF THE *QUASAR PLUS* CAP. 8

Pag. 30 **8.1** Description of the ***QUASAR PLUS***
Pag. 30 **8.2** Table of ***QUASAR PLUS*** components
Pag. 30 **8.2.1** Description of ***QUASAR PLUS*** components
Pag. 31 **8.2.2** Example of how the ***PLUS*** module is used
Pag. 32 **8.3** Residual risk

MAINTENANCE CH. 9

Pag. 33 **9.1** Cleaning
Pag. 33 **9.2** Routine maintenance
Pag. 34 **9.3** Unscheduled maintenance
Pag. 34 **9.4** Restarting after a long period of inactivity
Pag. 34 **9.5** Requesting technical assistance

TROUBLESHOOTING CH. 10

Pag. 35 **10.1** Warning
Pag. 35 **10.2** Problems, causes and remedies

APPENDICES

Pag. 37 **A.1** CE Declaration of conformity
Pag. 38 **A.2** Warranty certificate and identification form
Pag. 39 **A.3** Maintenance and repair worksheet
Pag. 40 **A.4** Notes

The data given in this manual may be modified without prior notice.

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CHAPTER 1: INTRODUCTION

HOW TO READ AND USE THE MANUAL 1.1

This Use and Maintenance Manual provides information on the utilisation, installation and maintenance of the optical welding machine ***QUASAR***, manufactured by ***Zhermack S.p.A.***

• The machine must be used in accordance with the instructions in this manual: it is therefore recommended that you read it carefully prior to installation and start-up. Make sure that you read the entire manual and pay particular attention to messages written in bold type or items highlighted by boxes and/or symbols: the symbols are designed to highlight situations involving danger or requiring caution (see paragraph 1.2).

• Observance of standards and regulations shown in this manual will ensure that the machine is used properly and that maintenance work is carried out safely.

• This Use and Maintenance Manual is an integral part of the machine: it should therefore be kept together with the machine so that it can be consulted as and when necessary (keep the booklet in a secure dry place away from sunlight, atmospheric agents, etc.). It must be available for consultation throughout the working life of the machine even when the machine is sold or finally dismantled.

• It is recommended that you keep this manual constantly updated by integrating any amendments, additions or modifications made by the Manufacturer. Any notes or comments should be made on the blank pages at the rear of the booklet (see Appendices: Notes).

• Use the manual properly so that it is not damaged in any way.

• Do not remove, tear or write on any part of the pages.

• If the manual is lost or damaged and its contents become illegible you can request a replacement copy from the Manufacturer.

The purpose of this Use and Maintenance Manual is to provide users with information on how to operate the machine properly. The manual contains all the information needed to use the device as intended: in particular the manual includes instructions and information on the following:

• correct installation of the machine;

• Detailed description of how the machine works and its components;

• Initial start-up;

• Scheduled maintenance;

• Basic Safety and Accident Prevention info.

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This manual contains nine chapters each of which covers a specific argument.
The appendices at the rear of the manual are a useful complement to these chapters.

1.2 TERMINOLOGY AND SYMBOLS

It is important that you understand the following symbols and their significance as they highlight important information such as critical situations, practical advice, or straightforward information.
If you have any doubts as to the significance of a symbol always consult this page.

• Tasks for which failure to observe instructions or tampering with machine parts may put personnel in serious danger are highlighted by the symbol:



DANGER!
This symbol refers to safety standards which must be observed at all times in order to protect both workers and machine.

• Critical situations concerning dangerous areas or tasks in which failure to observe the instructions may render the warranty null and void, or cause damage to machine, connected components or the surrounding area, are highlighted by the symbol:



WARNING!
This symbol refers to safety standards which must be observed carefully in order to guarantee your safety, other people's safety and prevent damage to the machine.

• Any work that fails to comply with instructions in this manual, or any tampering which might automatically render the warranty null and void, is highlighted by the following symbol:



FORBIDDEN!
This symbol refers to actions which must never be carried out (i.e. forbidden actions).

• Any general information and/or advice which may be useful at any time is highlighted by the following symbol:



NOTE!
This symbol highlights information and/or useful advice.

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CHAPTER 2: GENERAL INFORMATIONS

RESPONSABILITY 2.1

Failure to observe the instructions in this Use and Maintenance Manual exonerates the Manufacturer from any liability whatsoever.
For any matters not covered by this manual or about which you have any doubts please contact the Manufacturer directly:

Zhermack S.p.A.
Via Bovazecchino, 100
45021 Badia Polesine • RO • Italy
Tel. +39 0425 597 611 • Fax +39 0425 53 596
http://www.zhermack.com e-mail: info@zhermack.com

If machine maintenance work fails to comply with instructions or is done in such a way as to compromise machine integrity or modify its characteristics ***Zhermack S.p.A.*** shall be exonerated from any liability as regards worker safety and/or machine performance.

WARRANTY: GENERAL INSTRUCTION 2.2

Included in the Appendices to this Use and Maintenance Manual you will find the Warranty certificate and the ID Form which must be filled out in full.
In general the Warranty is rendered null and void by the following:
• Improper machine use.
• Incorrect installation.
• Serious negligence of maintenance schedules.
• Modifications to or work on the machine which has not been authorised by the Manufacturer (especially on safety devices).
• Use of non-original spare parts.

Zhermack S.p.A. **cannot, as of this moment, be held liable if the machine is modified or tampered with without prior written consent from the Manufacturer. Consequently, any repairs made by unauthorised personnel, use of non-original spare parts or failure to comply with the installation standards specified in this manual shall immediately render the Warranty null and void.**



AUTHORIZED PERSONNEL 2.3

Personnel may be divided into the following categories:
• ***Operator-user:***
Person trained to use the machines. He/she may carry out all the tasks needed to operate the machines: these tasks include starting/stopping the machine, carrying out routine inspections

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and any other tasks linked to everyday machine use.



The operator-user must only use the machine when it is fully assembled and the safety devices are working properly as described in this manual.



Before using this machine or carrying out any work on it, the operator must read the entire contents of this manual. This manual has been drawn up to provide the user with essential information on rational, safe utilisation of the machine. The user must comply with the information given at all times.
Furthermore, the user must use the work sheets enclosed with this manual so as to keep a record of maintenance/component replacement work as well as make notes on any machine malfunctions.

• ***Zhermack S.p.A. authorised maintenance technician:***
Person authorised to carry out work on the machine under all operating conditions and all safety levels. He/she is also authorised to carry out any mechanical or electrical repairs/adjustments, scheduled maintenance and any component replacement work.

2.4 GENERAL SAFETY REGULATIONS

The operator must read the advice and warnings given below and comply with such regulations at all times: doing so will ensure safe, long-lasting machine performance.
• Do not allow untrained personnel to use this machine.
• Ensure that the work area is properly prepared: it must be free from obstacles, clean and properly illuminated.
• Take measures to ensure that you are not distracted when using the machine.
• In the event of a malfunction follow the advice given in this manual: if you have any doubts shut down the machine and contact your Authorised Service Centre immediately.
• Never use a malfunctioning machine and always inform the Maintenance Manager of any faults. Never use a malfunctioning machine and always inform the Maintenance Manager of any faults.
• Safety tweezers, goggles and gloves must be used.
• Do not leave the machine with shields unmounted.
• Do not open compartments containing electrical apparatus.
• Do not replace the power lead or tamper with the supplied plug.
• It is forbidden to use the machine on items other than those for which it has been specifically designed.
• Before doing any cleaning, routine and/or unscheduled maintenance work make sure that the machine has been unplugged from the mains socket.

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• Make sure that there are no foreign objects inside the work area as these could damage the machine and/or injure personnel.
• Do not use petrol or flammable solvents as detergents; use only non-flammable, non-corrosive, and non-toxic substances (see paragraph 8 .1).
• Do not use compressed air for cleaning small pieces; however if you do protect yourself with proper goggles with lateral face guards and limit the pressure to 2 bar at the most.

Zhermack S.p.A. **cannot be held liable for any damage to persons or objects caused by incorrect maintenance carried out by unqualified personnel or maintenance work that does not comply with the instructions in this manual.**
Zhermack S.p.A. **is, as of this moment, exonerated from any liability concerning injury to persons or damage to objects that may result from using this machine in a way other than that described in this manual.**



This machine has electrical parts: therefore, in the event of a fire, no matter how small, use only powder-type extinguishers. Never attempt to put out an electrical fire with water.



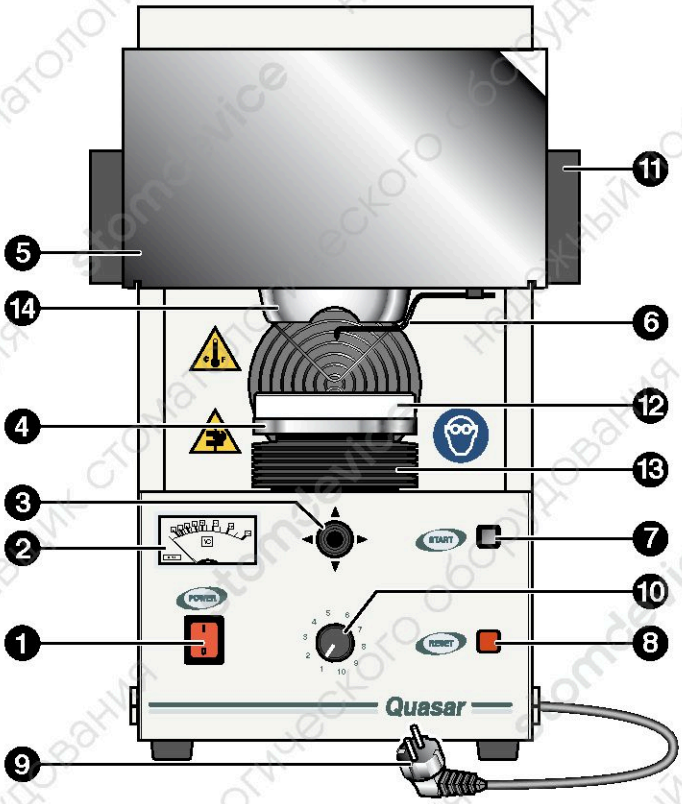
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CHAPTER 3: DESCRIPTION OF THE MACHINE

3.1 GENERAL DESCRIPTION OF THE MACHINE

The machine described in this Manual is the optical welding machine ***QUASAR***, produced for welding metals by dental technicians.

3.2 TABLE OF THE COMPONENTS



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Description of the components 3.2.1

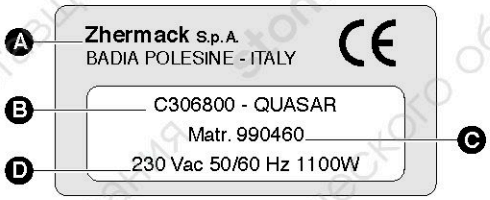
1.	Main switch	8.	Push button lamp “off” switch
2.	Temperature indicator	9.	Electrical plug
3.	Joystick for the handling of the surface working	10.	Power temperature control
4.	Surface working plate	11.	Side handles
5.	Mobile protection screen	12.	Refractory platform
6.	Mechanical pointer	13.	Mobile support
7.	Push button lamp “on” switch	14.	Cover

Operating summary 3.2.2

• The main switch (**1**) feeds power to the machine;
• The joystick (**3**) for the handling of the working surface: controls lift, fall and rotation on the central axle of the work to weld.
• The start switch (**7**) operates the infrared beam lamp, starting the welding cycle;
• The reset switch (**8**) switches off the infra-red beam lamp, ending the welding cycle;
• The power control (**10**) must be brought back to zero before starting a new welding cycle;
• Two safety micro-switches detect the position of the protecting screen (**5**) and of the mechanical pointer (**6**) avoiding starting or stopping of the welding cycle if their positions are wrong.

IDENTIFICATION DATA 3.3

The machine described in this manual has an ID platelet giving information about both the machine and the manufacturer:



A. Name and address of manufacturer
B. Machine code and model
C. Serial number
D. Power supply information

The machines has been built in compliance with the EC directives listed in the enclosed "EC declaration of conformity". When requesting spare parts, information or assistance from your Authorised Servicing Centre always quote the data on the ID plate.
Should the ID plate deteriorate and become illegible, even partially, order a replacement plate from the manufacturer: remember to quote the relevant data.

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Do not remove and/or damage the plate as you must be able to read the data at all times.

3.3.1 On-machine labels and symbols

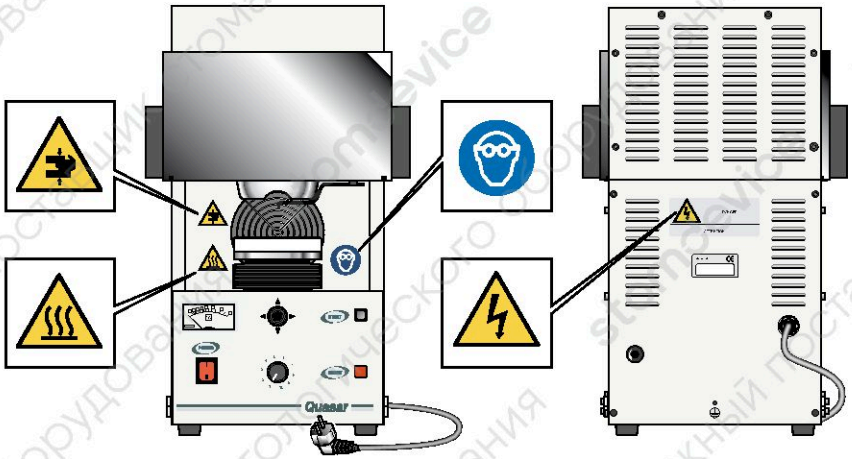
On the machine there are positioned others plates and symbols (as shown in the figure below), which point out:

WARNING! ELECTRIC CURRENT DANGER. DO NOT OPEN, REMOVE FLAP DOORS OR PROTECTIONS BEFORE SWITCHING OFF THE POWER SOURCE.

WARNING! CRUSHING DANGER. DO NOT INSERT PARTS OF THE BODY OR OBJECTS INTO THE MACHINE NEAR THE DANGER SITE.

WARNING! HIGH HEAT DANGER. YOU MUST USE PROPER TWEEZERS AND THERMAL PROTECTING GLOVES.

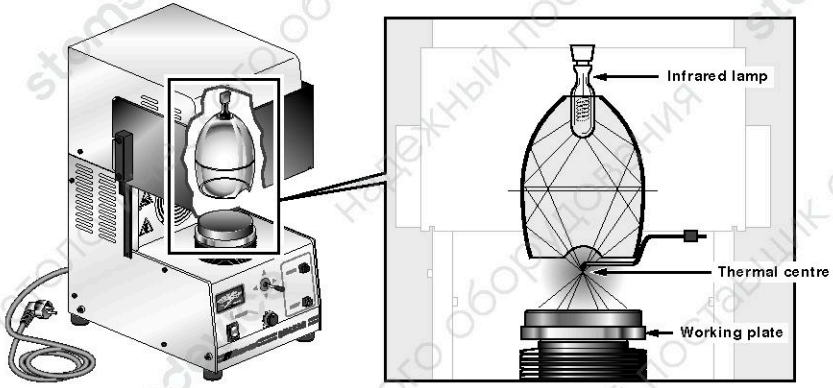
WARNING! HIGH BEAMS DANGER. YOU MUST USE PROTECTIVE GLASSES.



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CHAPTER 4: TECHNICAL CHARACTERISTICS

TECHNICAL CHARACTERISTICS AND OPERATING START 4.1



Zhermack S.p.A. produces working units qualitatively and technologically advanced so that the dental technician, using it every day, understands that the instrumentation is evolved and manifactured according to his own working needs.
Producing its machine ***Zhermack S.p.A.*** has used a very advanced instrumentation in the planning field. The usage of materials of first-rate quality and the practicability of all the necessary running for the operator safety, assure ***Zhermack S.p.A.*** products and make them competitive world-wide.
As regards the optical welding machine ***QUASAR***, its distinctive principle of working is based on production of heat energy through a source of electro-magnetic infrared waves.
The optical welding machine ***QUASAR*** is a unit for dental use produced for welding precious metals and low-percentage alloy with high temperature and without a direct flame. An optical system focusing the radiation concentrates the heat energy inside a confined space, in order to better the precision of the welding operation as regards the traditional systems with flame. The system allows in this space a homogeneous temperature. The perfect focusing of the elements to weld gives an optimal thermal area of about 1 cm in diameter.
The optical welding machine ***QUASAR*** is equipped with a power control system that can determine the heating temperature produced: then it will easily heat gradually the elements to weld without risk of burning them.
The presence of a system for the extraction of smoke and gas produced during the welding will prevent residual deposits entering the welding itself so avoiding porosity.
The careful focal sighting of the elements to weld is allowed by a precise mechanical centring device and it is optimised by a fine and regular electronic movement free from vibration.
It is always possible to make electronically the lift, fall and the rotation of the working plate platform around the instrumentation optical axle.
The welding vision process is made easier through the screen which allows the observation on three sides.
The machine utilises contemporary technical features and therefore cannot be considered inadequate only because it may become updated in accordance with new experiences.

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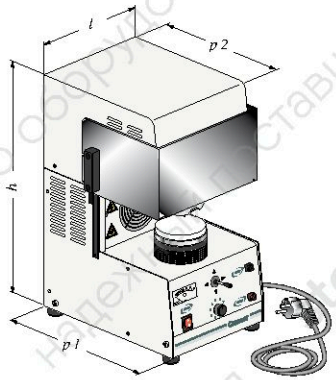
4.2 TECHNICAL DATA

Technical data regarding the optical welding machine ***QUASAR***:

• Power input	230 Vac ± 10% 50/60 Hz
• Maximum watt input	1100 Watt
• Maximum temperature	1350 °C (in the thermal centre)

4.2.1 Weight and overall dimensions

DIMENSIONS	WITHOUT PACKING	WITH PACKING
Height (*h*)	cm 50	cm 70
Length (*l*)	cm 25	cm 45
Depth (*p1*)	cm 36	cm 50
Depth (*p2*)	cm 29	cm 50
Weight	kg 27	kg 32



4.2.2 Noise levels

The machine characteristically produces an acoustic pressure level in the operating mode lower than 70 dB (A).

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CHAPTER 5: TRANSPORT AND MOUNTING

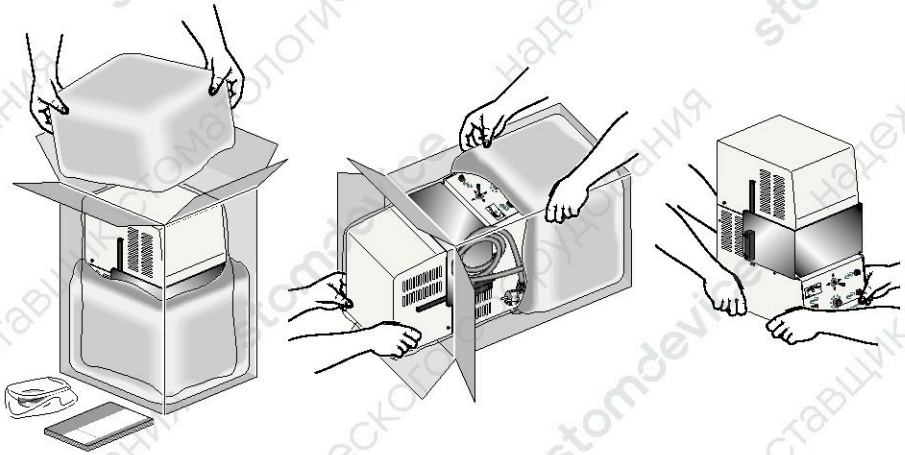
WARNING 5.1

To prevent any injury to persons or damage to things always proceed with the utmost care and attention when mounting the machine. Observe all the precautions and instructions contained in the following paragraphs.

PACKING AND UNPACKING 5.2

All the material is thoroughly checked by the Manufacturer prior to shipment. When you receive the goods make sure they have not been damaged during transit and that no-one has tampered with the packaging and removed any of the parts contained therein.
Should you note any damage or missing parts please inform your Dealer and the shipping carrier immediately: take photographs and send them on to both dealer and carrier.

The packaging, consisting of a cardboard box with internal expanded plastic padding, contains:
- the optical welding machine ***QUASAR***;
- the refractory platform;
- this Use and Maintenance Manual.



The optical welding machine *QUASAR* is not equipped with tweezers, thermal gloves and protection glasses; but in order to operate the machine, you should use them.

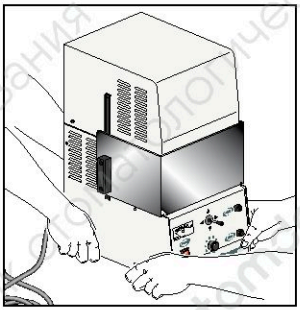
It is recommended that you keep the original packaging so that, if necessary, it can be re-utilised; doing so ensures that you do not use unsuitable packaging materials during transport and mounting which might lead to accidental damage (see section 5.3).

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5.3 TRANSPORT AND MOUNTING

If it is necessary to move the optical welding machine ***QUASAR***, besides disconneting of the machine from the electrical system, you must:
1. remove the firebrick working platform;
2. close the protecting screen after checking if any object has been left on the mobile surface;
3. assemble all its components;

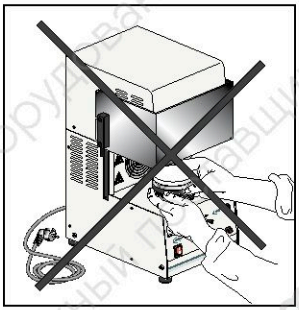
The mounting for transport and/or packing of the machine must follow some basic rules such as:



a. For handling and/or moving the welding machine you need at least 2 (two) persons gripping the unit from the bottom.



b. It is forbidden handling and/or moving the optical welding machine by gripping it at the protecting screen.



c. It is forbidden handling and/or moving the optical welding machine gripping it by the surface working plate.

4. Pack the machine in its original box or, if this is not possible, take all the necessary precautions to protect the machine against knocks or drops, in that the goods are transported at the owner's risk.
To this end always bear in mind the weight and dimensions of the unit being handled to prevent any damage caused by inobservance of these measurements.

Failure to observe the above exonerates the Manufacturer from any liability concerning machine malfunction and consequently renders the Warranty null and void.

When shipping/delivering the machine to your Authorised Servicing Centre always enclose a copy of the purchase document and a copy of the properly compiled ID form.

If the unit is to be transported by courier, the postal service or rail it is recommended such shipments be insured.

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ELIMINATION / DISMANTLING 5.4

When disposing of the ***packaging materials*** the user must comply with the standards in force in his/her country regarding the following materials:
• Wood/paper: non-polluting materials, but must be recycled properly.
• Polystyrene/plastic: pollutants which must not be burnt (toxic fumes) nor dispersed into the environment, but disposed of in compliance with the standards in force in the country of use.

If the machine is to be ***dismantled*** the user must, in compliance with EC directives and the laws in force in the country of use, effect elimination and recycling of the following materials:
• Plastic and glass parts, insulated electrical wiring, rubber parts.
• There are no toxic or corrosive parts.

This product must not be disposed of as household waste but rather, when no longer used, must be collected separately according to EC Directive 2002/96.



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CHAPTER 6: INSTALLATION AND FIRST-TIME USE

6.1 WARNINGS AND PRECAUTIONS

Before proceeding with installation make sure that all relevant safety conditions prevail and follow the instructions below carefully.

So as to provide greater clarity the numbers given in the diagrams in this chapter correspond exactly to the numbering in the Components Table (Ch. 3).

6.2 PERMITTED AMBIENT CONDITIONS

Unless stated otherwise at the time of order the machine will be configured to operate properly under the following ambient conditions:

Min ambient temperature	0°C
Max ambient temperature	40°C
Max humidity	90%

Ambient conditions other than those listed above may cause malfunctions or sudden breakdowns. Lighting in the installation area must be sufficient to provide good visibility at every single point on the machine.
More specifically, luminosity must not be less than 200 lux, lighting must be as uniform as possible and there must be no reflected light as this could dazzle the operator.

The machine must not be used in workplaces having an atmosphere which is explosive and/or at risk of fire as it has not been designed for use in such areas. Nevertheless, should a fire accidentally break out follow the procedure described in paragraph 2.4.

Work area lighting is an important factor in both personnel safety and the ultimate quality of the work being done. In Italy lighting must comply with a Ministerial Decree Law that clearly defines minimum lighting requirements. In other countries lighting requirements form part of the accident prevention and workplace hygiene standards.

6.3 REQUIRED WORK SPACE

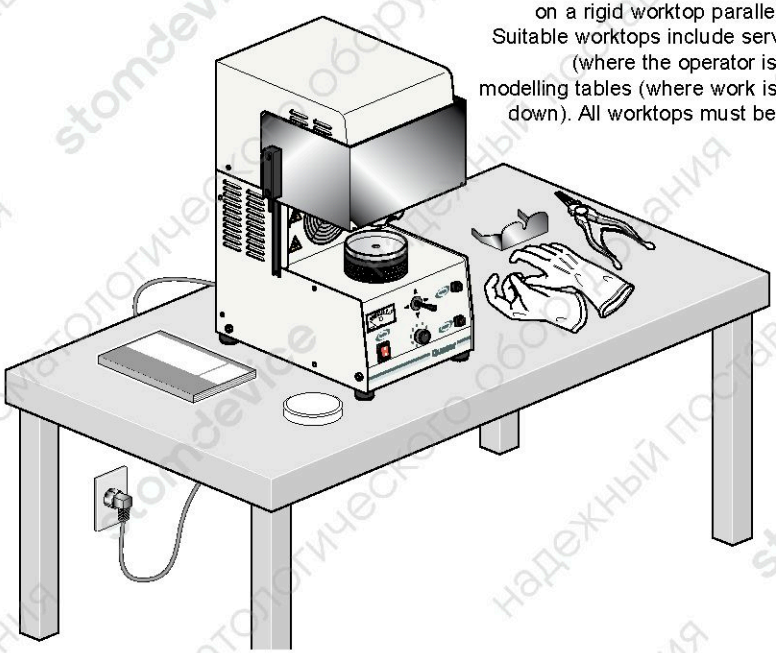
Choosing a good workplace with an appropriate amount of space available for machine installation is an essential factor in personnel safety, the quality of the work and proper maintenance. This zone must not only be spacious enough to allow for optimum machine operation but must also be well illuminated, aired, not dusty and not exposed to direct sunlight.

The *QUASAR* optical welder does not require an air aspiration system.

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Worktops 6.3.1

The machine has been designed for use on a rigid worktop parallel to the floor. Suitable worktops include service furniture (where the operator is standing) or modelling tables (where work is done sitting down). All worktops must be checked for stability.



CONNECTING UP TO THE POWER SUPPLY 6.4

The user must provide a power connection with relative socket near the machine installation point. The user must also install an adequate electrical circuit breaker upstream from the socket as well as efficacious overload/indirect contact safety devices.
Connection is effected via the safety plug (16A, in compliance with European standards) at the end of the power lead: this must be inserted in the mains socket.
When connecting check:
• that mains voltage and frequency are as indicated on the identification plate (incorrect power supply voltage may damage the machine);
• that the mains supply has a proper, efficient earth connection.

It is forbidden to tamper with the power lead and its plug. When replacing them owing to damage and/or wear please contact an Authorised Service Centre.



A proper earth connection is compulsory. Should it temporarily be necessary to use an extension lead the latter must comply with the standards in force in the country of use.



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6.5 STARTING UP THE MACHINE

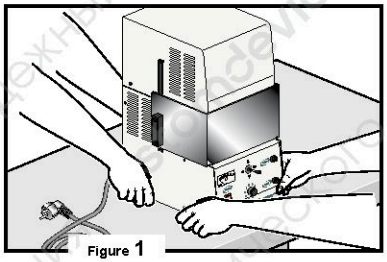

Figure 1

Fig. 1 : Place the welder evenly on the worktop (see paragraph 4.2.1).

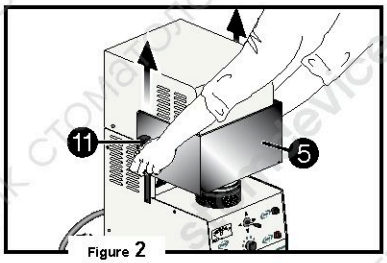


Figure 2

Fig. 2 : Use the side handles (**11**) to raise the protective screen (**5**) and gain access to the worktop.

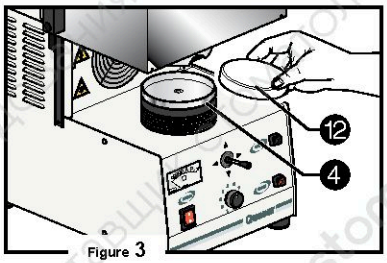


Figure 3

Fig. 3 : Before doing any welding and before switching on the welder position the refractory platform (**12**) on the surface working plate (**4**).

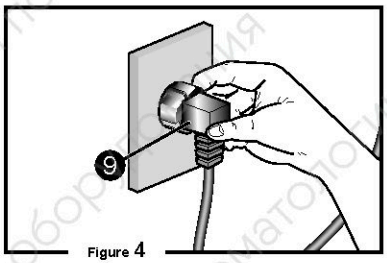


Figure 4

Fig. 4 : Connect the welder plug (**9**) to the power supply socket. **The power supply must be 230 V AC ±10% 50/60 Hz.** Make sure that there is an effective earth connection and observe the relevant standards.

It is forbidden to tamper with the power lead and the plug.

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Fig. 5 : Turn the main switch (**1**) to ON.

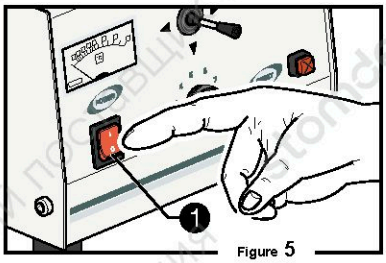


Figure 5

Failure to observe any of the above machine installation instructions may lead to malfunctions and render the warranty null and void.

PURPOSE OF THE MACHINE 6.6

The ***QUASAR*** optical welder has been designed to weld all alloys (except titanium alloys) used for dental technology purposes.
The absence of a direct flame makes it particularly suitable for precision welding where using a gas may alter the structure and chemical make-up of the alloys.
Both the surface working plate and the darkened protective screen (which shields against the intense light) can be rotated, thus providing maximum visibility during work.

Applications 6.6.1

The ***QUASAR*** optical welder can be used, with excellent results, for all dental technology alloy welds.
The alloys may be of low fusion temperature (e.g. precious alloys for metal/resin) and high fusion temperature (e.g. precious alloys for metal/ceramic, base alloys for metal/ceramic and skeletal prostheses).
Technical characteristics indicating the fusion interval of the following weldable materials:

WELDABLE MATERIAL	FUSION INTERVAL
Base alloys and gold for resins	500°C - 700°C
Metal/ceramic	750°C - 830°C
Gold/ceramic	1000°C - 1150°C
Steel and NiCr	1000°C - 1250°C

The *QUASAR* optical welder cannot be used with titanium alloys.

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6.6.2 Examples of use

• Fixed prosthesis: union of two parts of a bridge, of intra/extra-crown joints, secondary welding of a metal-ceramic bridge.
• Skeletal prosthesis: union of clasps to a plate, spot welds.
• Orthodontic prosthesis: union of bands and wires.

6.7 IMPROPER AND FORBIDDEN USE

All improper uses concerning the ***QUASAR*** optical welder are highlighted below so as to underline the importance of what must and must not be done with the machine:



The welder must not be used to heat or weld materials that generate smoke (e.g. wax, resin, plastic etc.)



The *QUASAR* optical welder has been designed for use with properly protected hands and the eye protection screen. Failure to protect hands and eyes could lead to burns or eye lesions and consequently loss of sight etc.).



It is absolutely forbidden to use the *QUASAR* optical welder to effect welds with your hands unprotected, without the protective screen lowered, without using the special surface working plate or to weld metals other than those used for dental technology purposes.



Using the machine for any purpose other than that described in this Manual shall be considered improper and thus forbidden.



Improper use renders the Warranty null and void and *Zhermack S.p.A.* shall not be liable for any damages to objects, workers or third parties.

The main reasons for which the Warranty may be rendered null and void are given in section 2.2 and in the "Warranty Certificate" enclosed with this Manual.

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CHAPTER 7: USING THE MACHINE

WARNINGS 7.1

The machine must not be used with any of its parts disassembled: before using the machine make sure that all its components are properly in place.

To ensure that work is done in absolute safety always make sure that you follow the described procedures with caution.

To provide greater clarity the numbers given in the diagrams in the following paragraphs correspond exactly to the numbering in Chapter 3 in the "Machine Description" section.

SAFETY SYSTEMS 7.2

Operator safety is guaranteed by the automatic control and safety devices.
The above-mentioned safety systems switch the infra-red lamp on and off. The lamp is switched off automatically when:
• it has been on for more than 2 minutes and 45 seconds;
• you attempt to start a welding cycle with the protective screen raised;
• you attempt to raise the protective screen;
• when you attempt to begin a welding cycle with the mechanical pointer outside its starting position;
• you attempt to start a welding cycle with the power adjuster not positioned at "zero".

Should even just one of the control/safety devices not be working properly proceed as explained in paragraph 7.5.

PREPARING THE MODELS TO BE WELDED 7.3

Fig. 6 : Before starting to prepare the model the surfaces to be welded must be cleaned thoroughly: sand-blast or use a rubber.

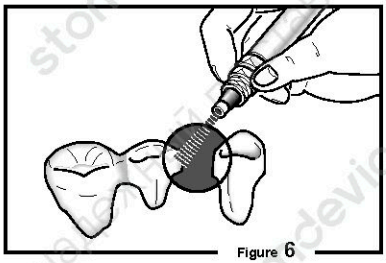


Figure 6

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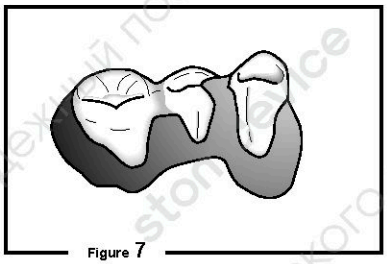

Figure 7

Fig. 7 : Fix the parts to be welded in the correct position: use bonding wax, cold resin, cyano-acrylic or another product that guarantees perfect positioning.

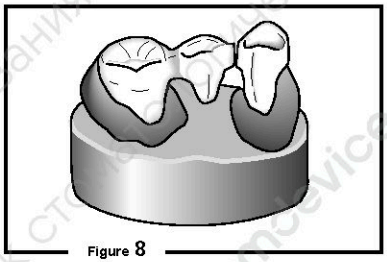

Figure 8

Fig. 8 : Prepare the refractory-lined welding base, making sure that the areas near the join are as relieved as much as possible (we recommend that you use very small quantities of refractory lining to avoid heat dispersion).
Remove the wax with hot water.

Pre-heat in the oven to eliminate other contaminants and fixing residue. This is why a piece to be welded must not be introduced into the *QUASAR* optical welder if it is still fixed with wax or resin: doing so may damage the welder itself.

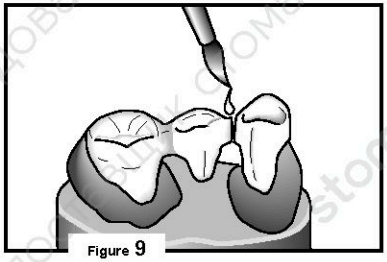

Figure 9

Fig. 9 : After checking the welding join to make sure it is free from any adhesive material carbon residue, apply a little flux on the parts to be joined together.

It is recommended that you use antioxidant liquid flux with a boric acid base. For chromes use the appropriate flux.

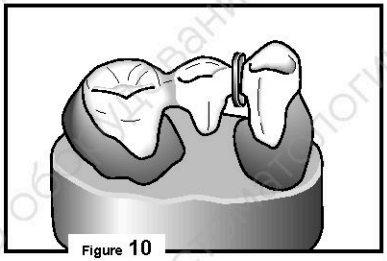

Figure 10

Fig. 10 : Apply the solder (also sprinkled with the same flux) around the joint.

It is recommended that you use round solder wire as this will adapt to the joint more readily.

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Fig. 11 : Position the work (**X**) on the refractory platform.

When welding pieces of a consistent mass it is recommended that you pre-heat in an oven at 400-500°C (for about 10 minutes) on a ceramic fixing platform.

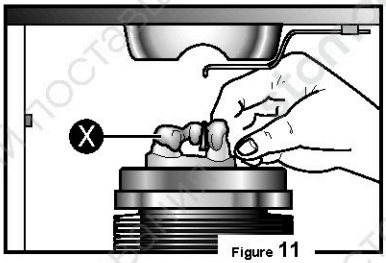


Figure 11

Fig. 12 : Shift the mechanical pointer (**6**) towards its guide limit stop so that it is in line with the central vertical axis of the surface working plate. At this point it corresponds to the optimum thermal focussing point and is in the exact position in which the welding joint needs to be positioned.

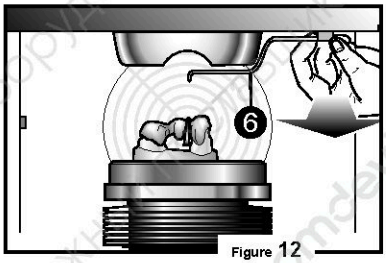


Figure 12

Fig. 13 : Use the joystick (**3**) to position the welding joint at the thermal focussing point indicated by the mechanical pointer. The joystick can be used to raise, lower and rotate the mobile support (**13**).

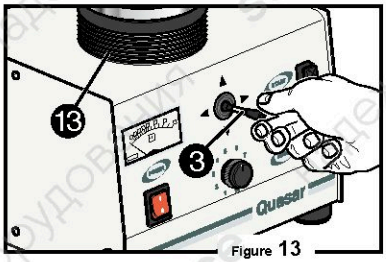


Figure 13

Position the welding join with the utmost care and attention. It must be precisely underneath the mechanical pointer: rotate the platform to check for proper centring.

Fig. 14 : Return the mechanical pointer (**6**) to its "home" position at the guide start point.

If the mechanical pointer is not in its "home" position the safety system will prevent the welder from being switched on.

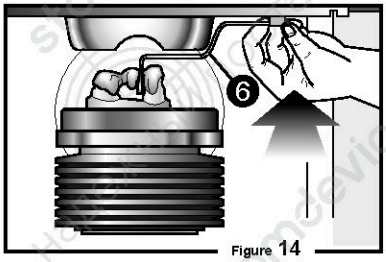


Figure 14

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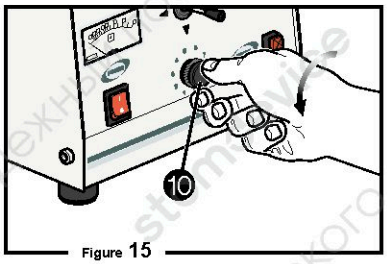


Figure 15

Fig. 15 : Turn the power temperature controller (**10**) anticlockwise as far as it will go and check that it is set to "zero".

If the power adjuster is not in the correct position the safety system stops the lamp being switched on in order to prevent erroneous thermal stress and allow the user to adjust the intensity to the type of weld to be effected.

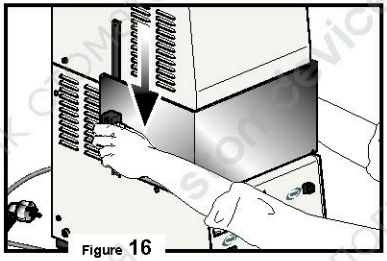

Figure 16

Fig. 16 : Grip the side handles and lower the protective screen.

Make sure that the screen is closed properly: if the screen is open the safety system will stop the lamp being switched on.

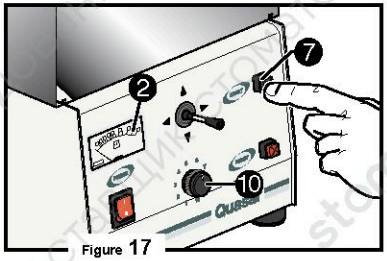


Figure 17

Fig. 17 : Press the START button (**7**).
Act on the power controller (**10**) gradually until the desired temperature setting is indicated on the gauge (**2**).

Welding progress can be checked by looking through the protective screen.

Once the optimum welding temperature has been reached the solder will melt in just a few seconds.
Once you see that solder fusion has started use the joystick to raise the platform about 2-3 mm so as to shift the contact point of the parts to be welded to the exact thermal focussing point.
Monitoring this procedure though the protective screen allows the user to determine when the two parts have been joined.

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Fig. 18 : When the parts are joined switch off the lamp by pressing RESET (**8**) and return the power adjuster (**10**) to its "zero" setting.
The welding cycle is now over.

At this point, if the daily work session is over switch off at the main switch (1).

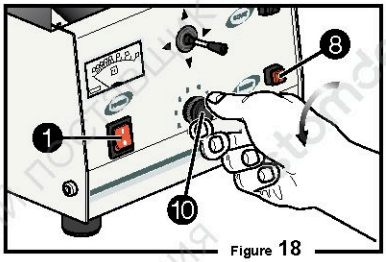


Figure 18

Raise the screen with the side handles and pick up the work with a pair of tweezeres and proceed as per standard work procedures. Wear appropriate protective gloves too.

After welding avoid direct contact with the surface working plate and refractory platform by taking the necessary precautions (e.g. use pincers): the accumulated heat energy dissipates over rather a long period.

Certain work procedures (e.g. secondary welding) may require slow cooling. Therefore, when welding is over do not raise the protective screen and switch off at the main switch. Wait for the item to cool down naturally. Following this procedure will protect the work against any thermal shock.

***Zhermack S.p.A.* cannot be held responsible for the quality or reliability of welds effected with the *QUASAR* optical welder which have not been made in compliance with the procedures described in this manual.**

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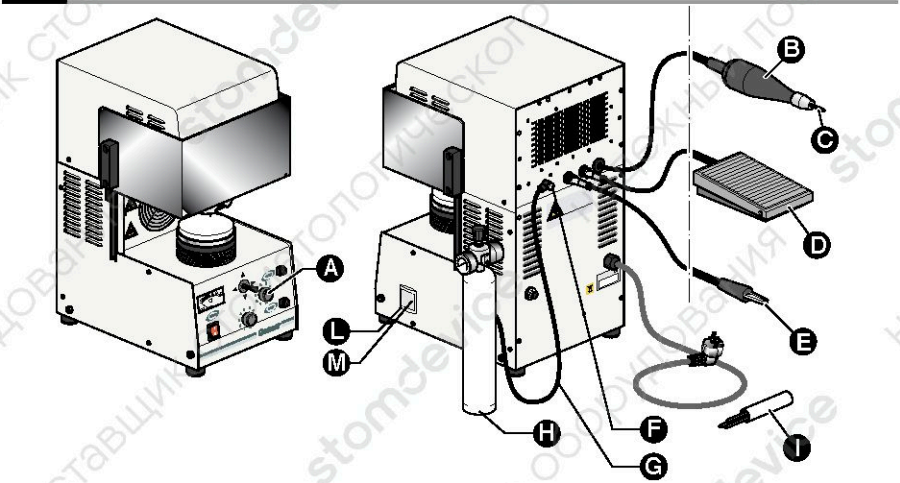
CHAPTER 8: DESCRIPTION OF THE *QUASAR PLUS*

8.1 DESCRIPTION OF THE *QUASAR PLUS*

The electronic module (***PLUS*** module) inserted on the machine allows spot-welding, with plasma technology, of the prosthetic materials to be joined. The new method eliminates the lining set-up phase of the pieces to be welded. In practical terms it allows welding to be carried out in a fraction of the time, thus making the system simpler, faster, easily repeatable and, above all, easy to learn.
Compared to the ***QUASAR***, then, the ***QUASAR PLUS*** has a foot control, a crocodile clip (to connect the earth) and a handpiece where the welding electrode is mounted (made of the same material as the pieces to be joined together).

The *PLUS* module is supplied as standard on *QUASAR PLUS* models. It can, however, be fitted (at the rear on the upper part) on QUASAR welders purchased previously. Contact the Authorised Assistance Centre.

8.2 TABLE OF *QUASAR PLUS* COMPONENTS



8.2.1 Description of *QUASAR PLUS* components

A.	Power/spot-welding regulator	**G.**	8x6 pipe (optional)
B.	Handpiece	**H.**	ARGON bottle (image is illustrative only)
C.	Welding electrode	**I.**	N° 3 Cr/Co electrodes Ø8 for ceramic
D.	Foot control	**L.**	Transparent pocket
E.	Crocodile clip	**M.**	Material info label
F.	8x6 pipe connector (for argon)		

WARNING:
THE ARGON GAS NEEDED FOR UTILISATION OF THE QUASAR PLUS IS NOT SUPPLIED AND MUST BE PROVIDED BY THE USER.

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Example of how the *PLUS* module is used 8.2.2

The following illustrations show an example of how to bind together two pieces to be welded directly on the master model.

Fig. 19: Adjust the spot-welding power by rotating the dial (**A**) on the frontal display of the ***QUASAR***.

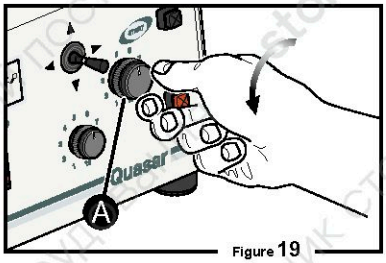


Figure 19

Fig. 20: Position the elements (**X**) to be welded on the model (**Y**).
Connect the earth by attaching the clip (**E**) to one of the elements (**X**).

Before beginning model preparation tasks it is necessary to clean the surfaces of parts to be welded thoroughly by sanding or using a rubber.

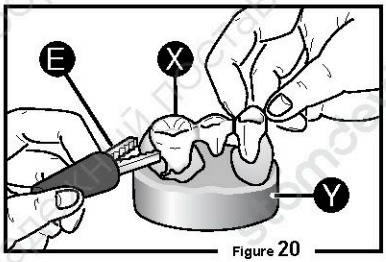


Figure 20

Fig. 21: Grip the handpiece (**B**) and rest the electrode (**C**) on the zones to be joined together; pressing the pedal (**D**) generates a discharge lasting a few tenths of a second. The tip melts and produces a metal point that joins and locks together the two parts to be welded.

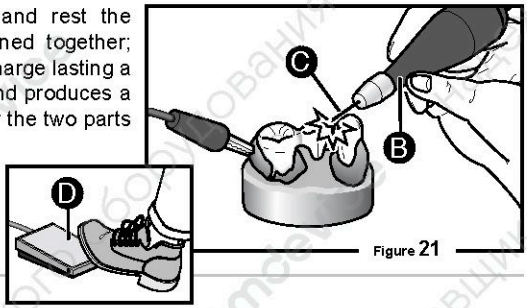


Figure 21

Three points will generally be enough to lock the two parts to be welded together.
The presence of ARGON (F-G-H) eliminates the risk of oxidation.

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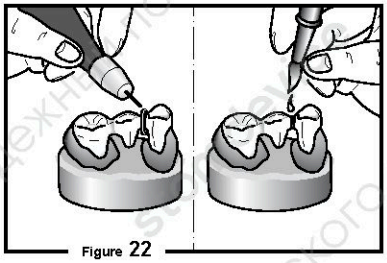

Figure 22

Fig. 22: Fix also the solder with one or two points, then apply a little flux of a type appropriate for the alloy used.

The use of flux in liquid or paste form is recommended.

Via the just-described procedure it is, at this point, possible to extract the piece (X) from the model (Y) and go on to complete welding with the infrared system (without the need, then, to position the model on the refractory plate too).

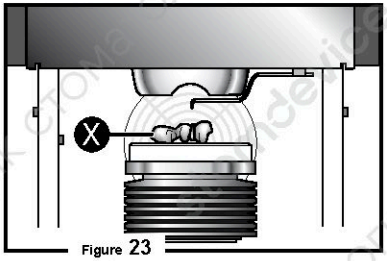


Figure 23

Fig. 23: Position the piece (**X**) on the piece-holder refractory plate and melt the solder, completing the welding.

To carry out welding tasks follow the instructions shown in Chapter 7, section 7.4 of this manual.

8.3 RESIDUAL RISK

Residual risk is:
• a danger that cannot be completely eliminated through design and application of safety devices.
• a potential danger which cannot be highlighted.
An emergency situation that might arise following failure of the electronics which run the safety systems, could involve the lamp suddenly coming on at full power with the protective screen raised, thus dazzling the operator. Should this happen switch off the welder immediately at the main switch. Proceed with maximum caution to prevent any damage to eyesight.

To prevent accidents always observe the instructions in this manual. Should you have any doubts at all please contact the Manufacturer or your Authorised Servicing Centre.

The above-mentioned dangers are indicated by special labels attached to the machine, as described in sub-section 3.3.1.

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CHAPTER 9: MAINTENANCE

CLEANING 9.1

The machine exterior can normally be kept clean just by wiping it with a dry cloth. If necessary, wet the cloth just a little water or use a non-degreasing detergent.
The operator must ensure that the machine is kept clean and free from any foreign bodies such as dirt, water, non-conducting liquids etc.
The machine must be cleaned at the end of every work session to remove all residues. Cleaning must be done with the machine at standstill and positioned in a stable manner.

Before cleaning the machine exterior always turn the main switch to OFF. It is strictly forbidden to clean the machine while it is connected to the mains power supply.



Never use inflammable, corrosive, alkaline or toxic liquids when cleaning the machine.



Eye goggles and a face mask must be worn when using compressed air for cleaning purposes. Do not allow any persons near the machine as they could be hit by flying dust.



ROUTINE MAINTENANCE 9.2

Once the machine has been cleaned (see section 9.1) the operator must check for worn, damaged or loose parts. If any such anomalies are discovered contact your Authorised Servicing Centre.

Should any of the above anomalies be discovered it is strictly forbidden to restart the machine before such faults have been set right.



More precisely, should the operator note any defects or problems of any kind whatsoever he/she must place a warning sign on the machine indicating that maintenance work is in progress and that using the machine is forbidden (EC-compliant signs can be purchased from the relevant suppliers).
Routine maintenance, cleaning and proper machine use are essential factors in guaranteeing long-lasting machine performance and safety.

Never use a naked flame to see what you are doing during checks or maintenance operations.



Machine safety devices/guards must never be removed except for repair and maintenance purposes.
Such items must be replaced as soon as the situation which led to their removal no longer exists and in any case before the machine is used again.



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9.3 UNSCHEDULED MAINTENANCE

Unscheduled maintenance (to be carried out by qualified, authorised personnel only) includes repairs of accidental breakages and replacement of worn or faulty parts.

All electrical and mechanical work must only be carried out by an authorised *Zhermack S.p.A.* maintenance technician.



Modifications which alter the machine characteristics from a safety and risk prevention viewpoint may only be made by the Manufacturer who shall then issue a certificate stating that the machine conforms to safety s tandards. Therefore any modification or maintenance tasks not actually described in this manual are to be considered forbidden. If the machine is modified, tampered with or repaired by unauthorised personnel or non-original spare parts are used the manufacturer is relieved of all responsibility. If a maintenance task is required but is not described in this manual you must contact an Authorised Servicing Centre.



9.4 RESTARTING AFTER A LONG PERIOD OF INACTIVITY

Should you intend to use the ***QUASAR*** welder after it has remained idle for a long period proceed as follows:

- clean the machine thoroughly (follow the instructions in paragraph 9.1 carefully).
- insert the plug in the mains socket.
- check that the following are working properly:
  - up/down/rotating movements of the work platform
  - mechanical pointer centring and on-rail movement

Should the welder fail to work properly contact an Authorised Servicing Centre immediately.

9.5 REQUESTING TECHNICAL ASSISTANCE

To obtain technical assistance choose one of the following options:

1. contact your Authorised Servicing Centre.

2. telephone the ***Zhermack S.p.A.*** Customer Assistance Service on the number **+39 0425.597.611** and proceed as follows: give personal data (e.g. address and telephone n.), state the information on the equipment ID plate (see paragraph 3.3) and explain the problem clearly.

3. fax all the above information and a properly filled out ID Form (see Appendix 2) to **+39 0425.53.596**.

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CAPITOLO 10: TROUBLESHOOTING

WARNING 9.1



Should any of the anomalies described below occur try setting the situation right, as far as is permissible, by following the instructions contained in this manual. Should the problem persist contact your Authorised Servicing Centre.

PROBLEMS, CAUSES AND REMEDIES 9.2

PROBLEM	CAUSE	REMEDY
Infra-red lamp does not work.	**1.** Plug not inserted properly. **2.** Mobile protection screen not closed properly. **3.** Mechanical pointer not positioned at limit stop. **4.** Power adjuster not set to "zero". **5.** Main switch damaged. **6.** Infra-red lamp burnt out. **7.** Electrical system damaged. **8.** Fuses blown.	**1.** Insert plug in socket. **2.** Close mobile protection screen. **3.** Position mechanical pointer correctly. **4.** Set power adjuster properly. **5-6-7-8.** Contact Authorised Servicing Centre.
Infra-red lamp comes on but does not weld.	**1.** Piece is not positioned at exact heat focus point. **2.** Infra-red lamp damaged. **3.** Cover not perfectly clean.	**1.** Position parts to be welded at the exact heat focus point. If problem persists contact Authorised Servicing Centre. **2-3.** Contact Authorised Servicing Centre.
Job-holding pan does not respond to joystick commands.	**1.** Mobile support damaged. **2.** Mobile support jammed by foreign body. **3.** Joystick control damaged. **4.** Mobile support needs lubricating.	**1-2-3-4.** Contact Authorised Servicing Centre.

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APPENDICES

CE DECLARATION OF CONFORMITY	A.1
WARRANTY CERTIFICATE AND IDENTIFICATION FORM	A.2
MAINTENANCE AND REPAIR WORKSHEET	A.3
NOTES	A.4

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DECLARATION OF CONFORMITY CE A.1

The Manufacturer:

Zhermack S.p.A.
Via Bovazecchino, 100
45021 Badia Polesine • RO • Italy
Tel. +39 0425 597 611 • Fax +39 0425 53 596

Declares that:

the optical welder
QUASAR

is built and equipped, latest modifications included, in compliance with the following EC directives and all related national legislation:

Electromagnetic compatibility:
EC Directive 89/336 amended and integrated by EC directives 92/31, 93/68 and 93/97.

Low voltage:
EC Directive 73/23 amended and integrated by EC directive 93/68.

Machine safety:
EC Directives 98/37 (G.U. n° L207 - 23.07.1998)

Please note that manufacturer's liability for damages caused by a defective product expires 10 years from the date in which the manufacturer put such product on the market and that such liability is transferred to the user as stated in EC Directive 85/374.

Badia Polesine, 01/07/2007

Tiziano Busin
Managing Director



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A.2 WARRANTY CERTIFICATE AND IDENTIFICATION FORM

1. This document certifies that the Manufacturer has built the product correctly using only top quality materials, carried out all the necessary tests and that the product complies with EC directives. This product Warranty is valid for 12-months as from date of delivery to the customer. Proof of such date shall be provided by a purchase document or the completed identification form. These documents must be handed over together with the equipment to the Servicing Centre. Persons wishing to make use of warranty coverage must make the fault known within eight days of its discovery as per Italian civil code art. 1495. Warranty cover is limited to replacement or repair of individual components or pieces with manufacturing defects and does not cover costs related to transfer of technical personnel, transport, packing etc. Breakdowns, faults or damages which derive from poor maintenance, incorrect power supply, negligence, inexperience and other causes not imputable to the Manufacturer and parts subject to normal wear are not covered by the Warranty. The Warranty does not cover breakdowns caused by failure to carry out routine maintenance or customer negligence.
This Warranty does not provide for any awards for direct or indirect damages of any kind caused to persons or things by any equipment inefficiency.
2. The Warranty is instantly rendered null and void if the equipment is repaired, modified or tampered with by the purchaser or any unauthorised third parties.
Responsibility for damages caused by defective products expires 10 years after the Manufacturer puts them on the market: after such time damages are the user's responsibility, as stated in EC Directive 85/374.
3. To have work carried out under Warranty the purchaser must only contact the retailer, the Manufacturer-authorised servicing centres, or the Manufacturer.
The Warranty entitles the purchaser to free replacement of defective parts. It does not entitle the purchaser to replacement of the entire equipment.
4. In the event of disputes over application of the Warranty, the quality or condition of the equipment, the purchaser shall not suspend payment or delay payment of the price or price instalment.
5. The purchaser shall not be entitled to damages for any loss of production.
6. The Warranty is rendered null and void if:
a. the equipment is damaged by a fall, exposed to fire, spilt liquids, lightning, natural disaster or any other cause not imputable to the Manufacturer.
b. installation has not been carried out properly.
c. power supply is incorrect (e.g. rated mains voltage incorrect). Erroneous mains connection (rated mains voltage incorrect), or failure to install proper protection devices.
d. the serial number has been removed, cancelled out or altered.
7. Any components to be replaced under the terms of the Warranty shall be sent back to ***Zhermack S.p.A.*** which shall then send the appropriate spare parts. Should the changed part not be replaced it shall be charged to the person who ordered it.
8. The Manufacturer and the Dental Deposit are not required to provide replacement equipments while repairs are carried out.
9. Spare parts shall, for tax purposes, only be provided under warranty where the relevant limitations set out in the terms and conditions of the warranty are observed.
10. For any other eventuality not provided for by this Warranty Certificate and the regulations consult the Italian Civil Code.
11. Labour, travel and call-out invoices must be paid for on their receipt.
12. The manufacturer and the dealer shall comply with all data processing laws, including proper observance of data security standards in compliance with the specifications given in the data processing information sheet.

IDENTIFICATION FORM

MACHINE MODEL:	MACHINE SERIAL NUMBER:
.....	.....
PURCHASER:	ADDRESS:
.....	.....
TOWN / POSTCODE:	TEL:
.....	.....
TAX CODE / VAT NUMBER RETAILER:	RETAILER:
.....	.....
	PURCHASER'S SIGNATURE:
	.....

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MAINTENANCE AND REPAIR WORKSHEET A.3

DATE	DESCRIPTION OF WORK	SIGNATURE

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45021 Badia Polesine (Rovigo) Italy
Tel. +39 0425 597 611 - www.zhermack.com

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