



QUAZER™

AUTOMATED DIAMOND CUTTING SYSTEM



SARIN QUAZER OP GUIDE A116 ver 3 0 00 PV 03 31 JAN 2007.doc

MAINTENANCE GUIDE

by Sarin Technologies Ltd.

February 2007

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About this Document

This document is the Quazer system Maintenance Guide. All the information you need to maintain the Quazer system is provided in this document.

Notes and Warnings

The following note is used in this document.

NOTE

This is an example of a note.

Important Safety Information

Laser Safety

The QUAZER is a class 1 laser system.

NOTE

Exposure to the beam of a Class 1 laser will not result in eye injury and may therefore be considered safe.

However because this class 1 system contains a laser system of a higher class it is vitally important that the machine is NOT operated with any of the protective doors, covers, hoods or windows open.

We at Sarin recommend that you provide laser safety training to all employees who work on or around the laser system. It is important that they understand the bio-effects of lasers as well as the facts about laser-radiation.

System installation, disassembly, maintenance and repair must only be performed by authorized Sarin customer support engineers. Sarin trained engineers are trained to comply with all applicable safety requirements regarding the use of laser devices at the customer's premises.

NOTE

The Sarin warranty becomes null and void if servicing of the system is undertaken by a third party.

If the panels are removed during servicing, the system may reach class 4. Therefore, it is important that the instructions of the Sarin engineers be adhered to. For this reason access to the system may be blocked during maintenance of the optics according to laser safety class 4. To fully comply with CE/UL requirements, the system must be isolated from the rest of the office environment during any maintenance involving the laser.

The requirements state:

If the system is in a room with other equipment, the room must be equipped with safety screens (either mobile or permanent) that can be closed so that they completely surround the system when maintenance is performed.

Obtaining Safety Screens and Glasses

For information on safety screens or blinds please see the website www.TLM-Laser.com or contact them at either info@tlm-laser.com or sales@tlm-laser.com.

Quazer Laser Description and Class

YAG, wavelength 532 nm, max power 12 Watts, Q Switch, class 4.

What is a Laser Class?

Laser products are classified to take account of the amount of laser beam you can get access to when the product is in normal use or during routine user maintenance. A laser product may contain a laser of a higher Class and this may be accessible during servicing.

A brief description of each laser Class can be found at: <http://www.hpa.org.uk/radiation/faq/laser/laser9.htm>

Acoustic Noise Levels

The European Directive (2003/10/EC) on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise) will be implemented nationally by Apr 2006 and will replace existing legislation such as the UK Noise at Work Act 1989.

The recommended acoustic noise in the operator environment should not be more than **80dB(A)**.


NOTE

The Sarin recommended quiet air compressor can be installed in the system working area as it is extremely quiet at 55dB(A).

Waste Electrical and Electronic Equipment (WEEE)

Disposal of Electrical and Electronic Waste



The symbol  is now displayed on Sarin products to show our compliance with directive WEEE. The WEEE directive is about recycling parts and states that no electrical or electronic equipment can be discarded into the city's normal waste disposal system.

Obligatory Acceptance of Discarded Electrical and Electronic Equipment

The end user of this product now has the right to request the product supplier to dispose of the product. Therefore, if you require help in discarding this product please contact your local agent or Sarin directly.

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PERIODIC MAINTENANCE

WARNING

Never run the cooling unit without a filter installed.

Daily

1. Check the water temperature, pressure and water flow on the front of the cooling unit against the unit data sheet.
2. Ensure that the operator door interlock switch is working correctly and is not bypassed.

Weekly

1. Check that the water filter is not gray (clogged).
2. Check that the desiccators' display on the Laser assembly is **NOT** white.

Desiccators are used to remove moisture from the system. If it is completely white and not blue, replace it.

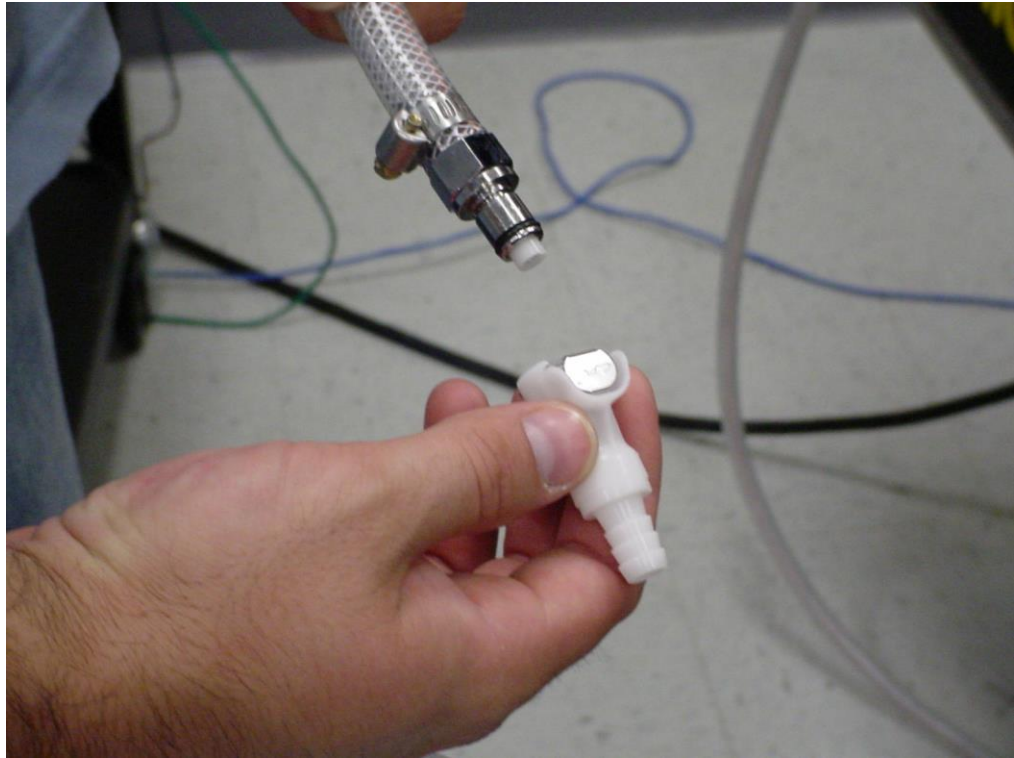
3-Monthly

Replace the desiccator on the Laser assembly.

6-Monthly

Chiller Draining Procedure

1. Turn off the chiller.
2. Remove the coolant lines from the laser.
3. Attach the female Quick Disconnect supplied with the plumbing kit to the Outlet line that comes off the back of the chiller and goes to the Coolant In line of the laser. (Reference Pic. below)



4. You will need either a bucket, an empty coolant bottle, or a drain to drain the coolant into. Turn on the chiller while holding the Coolant In line into an empty container. (Reference Pic. below) There will be approximately 1.2 gallons of water that will need to be removed from the chiller.



5. A low coolant alarm should sound a short time after you begin to drain the chiller.
6. Monitor the Coolant Level indicator on the back of the chiller.
7. The flow from the coolant line will start to sputter once you are almost out of coolant. Turn the chiller off at this point.
8. If there is any coolant in the filter housing remove the bottom half of the housing and drain it.
9. There is also a drain plug on the back of the chiller. That can be removed to empty the remaining coolant that is inside of the chiller.

Laser Head Draining Procedure

1. Shut down the laser power (eDrive) and the chillier.
2. Connect the hose with the air nuzzle (image below) to the Coolant In of the laser head
3. Connect the second hose to the Coolant Out of the laser head and put its end into a disposal bottle.
4. Connect the air hose of the system into the air nuzzle of the first hose.
5. All the water will be drained out from the laser head through the second hose.
6. Keep the air flow till there are no water drops at all.

Flush the Cooling System Using Cleaning Solution

1. With ALL power removed, completely drain the cooling system.
2. Remove filter cartridge from filter housing.

Press the button on the top of the filter housing to release the pressure.

3. Add 460-CCL2567 cleaning solution to the cooling system until full.
4. Run the cooling system with the cleaning solution for at least 30 minutes.
5. Drain the system completely.
6. Refill the system with distilled, demineralised or reverse osmosis water.
7. Run the cooling system and let the clean water circulate for 20 minutes.
8. Drain the system again completely.
9. Install a new filter cartridge in the filter housing.
10. Record the cleaning date on two stickers with a six month reminder to drain and purge the system.
11. Stick a label on the filter housing and another one on the front panel of the cooling unit.
12. Fill the cooling system reservoir with 460-PURELASE 180.
13. Return the system to use.

NOTE

If loss of water occurs during operation, top up the system to the full mark with 460-PURELASE 180 cooling fluid.

SYSTEM DESCRIPTION AND REQUIREMENTS

System Configuration

The QUAZER systems consist of:

- ❑ QUAZER Sawing and Cutting system
- ❑ Wall mounted electricity box for connecting the system power
- ❑ Compressor (optional) strongly recommended

Environmental Requirements

Air Conditioning

Temperature

The Quazer optimal operating temperature is 25°C (77°F). The system air conditioner system must be able to maintain this operating temperature even when the system is dissipating full power for extended periods.

Heat Dissipation

QUAZER System

Heat dissipation is TBD kW

Atlas Copco SF4FF Compressor

Heat dissipation is **2.2 / 3.7** kW

Humidity

The allowable relative humidity in the QUAZER system room is **50-60%**.

Dust evacuating system

The QUAZER system must be connected to a **Dust Collector** unit in order to evacuate the diamond dust during the time the laser is operating. A flexible pipe with a diameter of 10 cm is supplied with the system.

An example of a Dust Collector system used by Sarin is the KPF400 from Klepp. visit their website [<http://www.klepp.de/index-uk.htm>].

Particulate Matter and Chemical Vapors

1. The QUAZER system is designed to operate in an extremely clean environment. The work area **MUST NOT** be exposed to liquids of any type, corrosive vapors, or particulate matter.
2. Special care should be taken to avoid the accumulation of airborne dust or dirt particles in the QUAZER room, which can result in excessive wear of mechanical parts.
3. Normal plant air filtering should generally be sufficient to eliminate particulate matter. However, smoking should not be allowed in the QUAZER system room. Smoke particles accumulate on optical components and may also reduce the lifetime of computer equipment.

Fire Control

A Halon 1211 or similar gas extinguisher should be available in case of fire in or around the system. Do **NOT** use liquid fire extinguishers.

Compressed Air

- ❑ The QUAZER system requires that you obtain and use an extremely oil and humidity free compressed air supply. This is to ensure that no damage is caused to the diamond while being sawed or cut.

We at Sarin strongly recommend you use an Atlas Copco SF2FF or SF4FF air compressor.

The following specifications for the compressed air supply meet the very strict ISO 8573-1 standard:

Air quality classes ISO 8573-1	Dirt (solid particles)				Water		Oil
	Maximum number of particles per m ³ particle diameter (d) size, µm				Max. pressure dewpoint		Max. concentration
	≤ 0.10	0.1 < d ≤ 0.5	0.5 < d ≤ 1.0	1.0 < d ≤ 5.0	°C	°F	mg/m ³
0	As specified by the equipment user or supplier and more stringent than class 1						
1	*	100	1	0	-70	-94	0.01
2	*	100 000	1000	10	-40	-40	0.1
3	*	*	10000	500	-20	-4	1
4	*	*	*	1000	3	+ 37.4	5
5	*	*	*	20000	7	+ 44.6	> 5