1 PREVENTIVE MAINTENANCE VISITS

On a regular basis (at least once a year), you must contact your QUANTEL MEDICAL trained service representative to undertake the preventive maintenance visits of your laser system. The laser system general performance will be checked:

- Calibration of the aiming beam;
- Calibration of delivery system;
- Cleaning of external optics;
- Calibration of the screen touch.

2 CLEANING AND DISINFECTION

2.1 GENERAL

Although the use of the laser does not involve any skin contact with the patient, attention should be given to the possibility of cross-contamination between patients via the system patient contact areas (chinrest, headrest and steadying handles). In addition, the entire system will require routine cleaning as described in the care and maintenance section of this manual:
Chapter IV - Maintenance *Section 2.3 Cleaning and disinfection of the patient areas*

2.2 RESPONSIBILITIES

The health care facility where the instrument is to be used is responsible for:

1) Determining the level of cleaning and disinfection of patient contact areas required between patients;

2) Appropriate education and training for staff required to carry out cleaning and disinfection;

3) Ensuring that routine cleaning and disinfection methods used in the facility are compatible with the instrument;

4) Routine cleaning of the entire system.

2.3 CLEANING AND DISINFECTION OF PATIENT AREAS

It is very important to consider the risk of contamination between patients via the contact surfaces of the laser system: chin, headrest and stabilizing handles.

Although cleaning, disinfection procedures and standards in different medical services can vary widely, there are general guidelines:

1) Thorough cleaning of all patient contact areas is recommended for each procedure. Disposable chinrest papers can also be attached to the chinrest area and changed between patients.

2) Manual cleaning can be carried out by wiping all contact areas using a suitable liquid cleaning agent which is non-corrosive, non-toxic and low in residue.

3) Chemical disinfection of patient contact areas may be carried out provided that the method and materials chosen by the health care facility have been shown to be compatible with the instrument.

4) Steam sterilization and heat disinfection is not recommended and the chinrest assembly (or any other system components) should not be immersed in liquid.

Type of product recommended for the disinfection of the patient area:
Tristel Duo
Sporicidal Disinfectant for Ophthalmology
Manufacturer: *Tristel Solution Limited, United Kingdom*

2.4 CLEANING THE LASER SYSTEM

NOTE: The laser system has been designed to provide a trouble-free operation that minimizes downtime. As a result, very little user maintenance is required.

WARNING:

- **Unplug the power plug before cleaning the device.**
- **If necessary, allow the laser system to cool down for several minutes.**
- **Use only a damp cloth for cleaning.**
- **Do not use solvents or alcohol.**
- **All surfaces must be dried after cleaning.**

2.4.1 REAR PANEL

The air is expelled through the access holes located at the back of the laser console. Any built up dust should be cleaned as necessary. Use a dry cloth to remove dust from these surfaces.

2.4.2 LCD SCREEN

Make sure the LCD screen is turned off before cleaning the screen. If the screen is dark, it will be easier to see the areas that are dirty or oily. Use a dry, soft cloth (ideally the microfiber type of cloth used to clean eyeglasses) and very gently wipe the screen. Do not press hard on the screen in an attempt to scrub the dirt off because it could cause pixels to burn out.

WARNING: **Do not exert strong pressure while trying to remove dirt. This could destroy the pixels.**

2.4.3 HOUSING

Clean the rest of the laser system with a cloth dampened with a non-caustic cleaning solution such as soap and water, isopropyl alcohol, or a "hospital-grade" disinfectant avoiding any optical surfaces. Do not spray or pour cleaning agents directly on the system. Dry with a clean, dry cloth or allow to air dry.

WARNING: **Do not spray or pour cleaning products directly onto the unit.**

2.5 CLEANING THE OPTICS

Periodically inspect and clean the laser system optics.

The different optics of the laser system must remain clean in order to maintain optimal transmission of the laser beam and thus maintain its:

- **Slit lamp optics:**
  The slit lamp lens must be kept clean otherwise performance can be compromised.
- **Adaptor optics:**
  The reflecting mirror must be kept clean to optimize laser transmission. Output lens and doctor filter must also be cleaned. After each use, place the dust cover over the slit lamp to keep all optical surfaces clean.

Required equipment:

- Non-fluffy optic material (available in photography shops)
- Cotton bud
- Ethanol or pure methanol or AR.

Method:

- Remove dust from the optics with an appropriate lens brush.
- Remove dust from the optics with an appropriate lens brush.
  Moisten the optical tissue or Q-tip in the solvent and gently wipe it across the optical surfaces in linear strokes. Use a very light pressure to avoid misaligning the mirrors.
  Do not wipe the mirrors more than one or two times because excess wiping will only redistribute the dirt over the optical surface and cause scratches.
  Use one tissue or one Q-tip per wipe, then discard and use a fresh one for the next wipe.

WARNING: **Never use dry swabs or tissues to clean an optical surface, as this may damage the surface.**

2.6 OPTICAL FIBER & AIMING BEAM INSPECTION

Before beginning treatment procedure, check the aiming beam integrity: it is essential to the laser system safe operation.

WARNING: If the aiming beam is weak (blur / barely or not visible red spot): do not use the laser or delivery system: the optical fiber may be damaged. Operating the laser without the aiming beam may result in laser exposure to non-targeted tissue and possible injury. A damaged cable may cause accidental laser exposure to the treatment room personnel or patient, and/or set fire in the treatment room. Contact your local distributor or QUANTEL MEDICAL Service Department.

WARNING: When using an optical fiber delivery device, always inspect the optical fiber cable to ensure that it has not been kinked, punctured, fractured, or otherwise damaged. The optical fiber cable may be damaged if stepped on, pulled, left lying in a vulnerable position, kinked, or tightly coiled. Do not clamp the cable with a hemostat or other instruments.

2.7 ROUTINE CHECKS

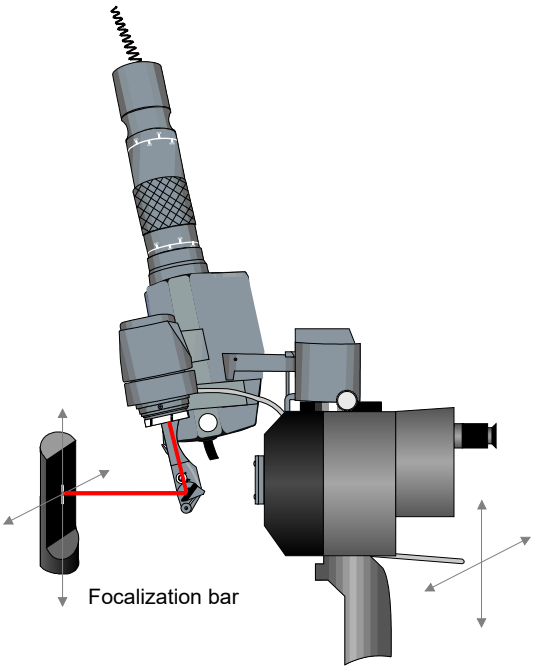
2.7.1 ADJUSTING THE EYEPIECES

Pupillary distance and visual acuity vary from one person to another. It is important that the user adjusts the eyepieces to suit his/her sight:

Step 1 / Adjusting the pupillary distance
This distance may be adjusted manually by narrowing or widening the distance between the eyepieces.

Step 2 / Adjusting for visual acuity
Adjust the eyepieces as often as necessary to obtain the sharpest possible image.

2.7.2 CHECKING SPOT MOVEMENT LIMITS



Horizontal and vertical movement of the micromanipulator

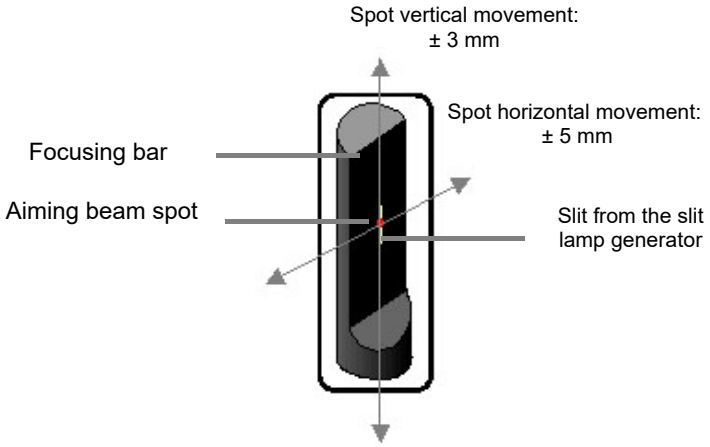
Preliminary conditions:

- Position the focusing bar on the slit lamp;
- Position the slit lamp generator at the center of the oculars;
- Switch on the slit lamp, position 8 (longest slit);
- Verify the fiber to laser connection;

Select a monospot treatment page.
The aiming beam is activated: project the aiming beam on the focusing bar.

NOTE: Do not select a multi-spot screen.

The red spot of the aiming beam and the slit of light must appear as clearly as possible on the focusing bar at the focal length of the slit lamp



Using the micromanipulator, check that the aiming beam spot can move likewise in both horizontal and vertical directions, up the lighted slit limits.

WARNING: If this is not the case, you must contact: your local distributor or QUANTEL MEDICAL Service Department

2.7.3 AIMING BEAM INTEGRITY

Before starting any laser treatment procedure, the integrity of the aiming beam must be checked:

WARNING: Do not use the laser system or the indirect ophthalmoscope terminal if the aiming beam is weak (blur / red dot barely visible or invisible): the optical fiber may be damaged. Using the laser without the aiming beam may result in non-targeted tissue being exposed to the laser beam and thus causing injury. Damaged fiber can cause accidental and dangerous laser exposure to the patient, personnel in the treatment room, and / or can cause a fire.
Contact your local distributor or QUANTEL MEDICAL customer service.

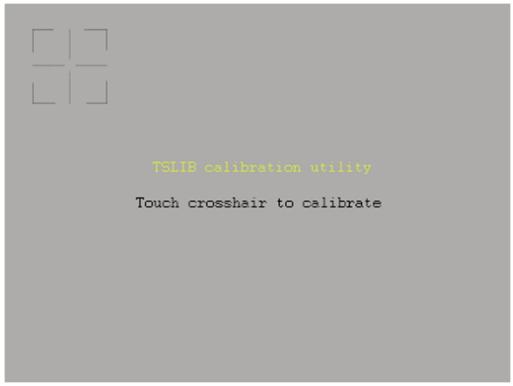
WARNING: Always inspect the fiber optic cable before use to make sure it is not bent, cracked, cracked, or damaged. It can be damaged, if a person walks on it, pulls it, leaves it in a bad position, wrongly or wraps it too strongly.

2.7.4 AIMING BEAM POSITION

The red aiming spot projected on the focusing bar must be positioned in the center of the luminous slot in position vertically and whatever the diameters of the laser spot.
If it is not the case, Contact your local distributor or QUANTEL MEDICAL customer service.

2.8 TOUCH SCREEN CALIBRATION

From the homepage, turn the power knob at the front of the unit clockwise until the following screen displays:



Press on grey crosshairs that display one after another (upper left, upper right, lower right, liwer left, and center of the screen).

The laser system automatically turns off and turns on when the calibration is completed.