MCE LASERS

TUNNEL LASER LD.60.B

OPERATOR'S MANUAL

MCE

This manual is an important part of your purchase. Please read it thoroughly before using your MCE Tunnel Laser.

We recommend that you record details of your purchase here so that the information is readily available if you ever need to contact your supplier.

Serial Number: .....

Date of Purchase: .....

Purchased from: .....

.....

.....

Telephone: .....

Facsimile: .....

Published by:

MOBA Mobile Automation Australia Pty Ltd
90 Willandra Drive
Epping 3076
Victoria, Australia

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MCE

WARRANTY

STATEMENT OF LIMITED WARRANTY

The Tunnel Laser is warranted to be free from defects in performance and workmanship for a period of twelve months from date of purchase. The warranty covers all costs of repair or replacement at the manufacturer's option.

LIMITS AND EXCLUSIONS:
The warranty will not apply to any damage resulting from negligence, accident, damage, misuse, repair, storage, or abnormal use.

The warranty is considered void if any attempt is made to repair or modify the unit whatsoever. If the warranty is made void, manufacturer reserves the right to charge the customer for costs incurred in repair or replacement of the unit.

MOBA is not liable for:

1 Freight charges incurred in return of defective unit to manufacturer.
2 Loss of income or inconvenience relating to defect in performance of the unit.
3 Leasing charges of alternative equipment during repair of a defective unit.

MOBA requires that the customer makes reasonable attempts to inform MOBA of problems with the product prior to returning the unit for repairs.

CONTENTS

1. GENERAL INFORMATION

1.1 DESCRIPTION

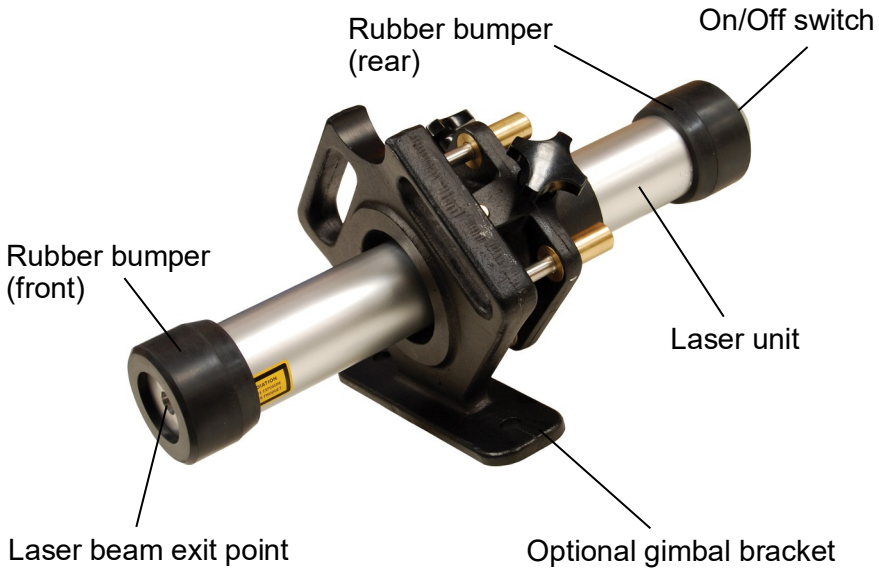
The MCE Tunnel Laser LD.60.B allows accurate construction and alignment of tunnels constructed by tunnel boring machines, drill and blast, pipe jack or conventional hand techniques.

1.2 FEATURES

The MCE Tunnel Laser LD.60.B is weather resistant, rugged and entirely constructed from aluminium. The laser is based on laser diode technology and powered through 4 ‘D’ cell alkaline batteries or trough an external power supply.

When used with the MCE-designed adjustable gimbal bracket, the laser can be easily installed on tunnel walls and adjust to target.

1.3 OVERVIEW



2. USING THE LASER

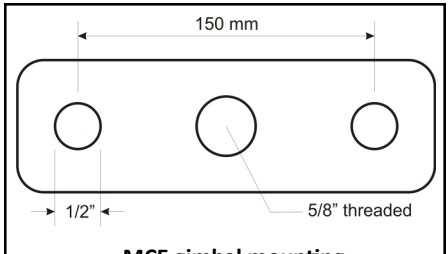
2.1 CONDITIONS FOR USE

The LD.60.B has a beam diameter of 13 mm and has a maximum power of 3 mW. Although this falls within the Class 2M regime for laser safety, it does present some hazards. The laser should always be operated with the safety of co-workers in mind. The laser beam of the LD.60.B will not cause any permanent eye damage, but mounting and positioning should be such as to reduce any distraction to the workers by the laser beam.

1. Do not view this laser beam along its axis, do not stare into the beam.
2. Never view the beam through optical instruments such as dumpy levels, which increase laser density.
3. When mounting the laser be aware of:
   - Mounting at eye height or where it may present a hazard to a person.
   - Mounting in a position which may be a hazard to moving machinery.
   - Direction and position of the laser beam affecting persons and machinery moving towards laser.
   - Ergonomics for persons replacing laser when batteries deplete.
   - Consider using visual aids such as “topes” to make the laser unit more visible.
4. Do not project the laser beam against highly reflective surfaces except for targets.

2.2 SET UP AND MOUNTING

1. Decide on a position such as a ceiling or side wall to mount the laser.
2. The mounting bracket for the LD.60.B should be secure.
3. Height and direction of the laser should be decided in reference to the projection



MCE gimbal mounting

target.

4. The laser should be slid into the mounting bracket.

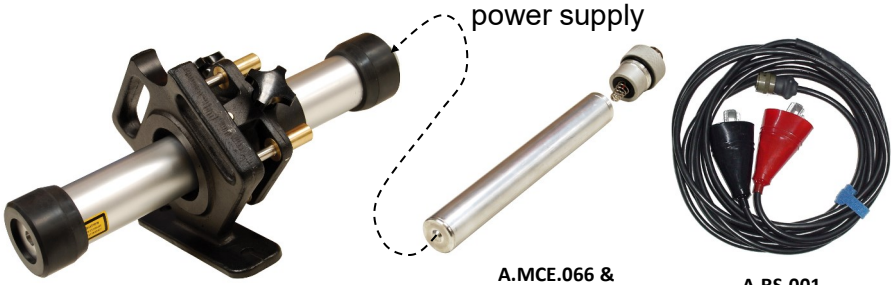
2.3 TURNING THE LASER ON AND OFF

1. The laser can be switched on and off by pressing the switch on the back of the unit.
2. The projected laser dot should be aligned and positioned in two axes using the knobs for X & Y laser direction alignment located on the gimbal bracket. This alignment should be done in reference to the target.

2.4 USING THE LASER WITH EXTERNAL POWER SUPPLY

The LD.60.B can be powered through 4 ‘D’ cell alkaline batteries or through an external power supply by using the MCE Dummy Battery A.MCE.067, the MCE Input Connector A.MCE.066 and the power cord A.RS.001.

1. Remove the rear rubber bumper.
2. Unscrew the rear switch assembly to access the battery compartment by turning counter clockwise.
3. Insert the MCE Dummy Battery A.MCE.067 into the battery compartment ensuring correct polarity.
4. Replace the rear switch assembly with the MCE Input Connector A.MCE.066 by turning clockwise until the rubber seal compresses firmly against the rear of the laser.
5. Replace the rear rubber bumper.
6. Use the A.RS.001 power cord to connect to an external power supply



A.MCE.066 & A.MCE.067

A.RS.001

3. REPLACING THE BATTERIES

The LD.60.B uses 4 ‘D’ cell batteries which can be replaced by following these steps:

1. Remove the rear rubber bumper.
2. Unscrew the rear switch assembly to access the battery compartment by turning counter clockwise.
3. Replace the batteries according to the polarity indicated in the battery compartment. Note that if the batteries are installed incorrectly, the laser has electrical and mechanical polarity protection.
4. Replace the rear switch assembly by turning clockwise until the rubber seal compresses firmly against the rear of the laser.
5. Replace the rear rubber bumper.

4. MAINTENANCE AND REPAIR

The LD.60.B should be returned to MCE Lasers (manufacturer) for any repair or service.

5. CARE AND HANDLING

1. Always store and transport the laser unit and accessories in their carry case.
2. You must always keep your laser and its accessories dry and clean after use. Do not store your instrument in its case if the instrument or the case are wet to avoid water condensation inside the instrument.
3. Although the components are rated from –20°C to +50°C, the recommended operating temperature is 0°C to +40°C.
4. Keep the aperture lens clean. Use a soft cloth and glass cleaner.

6. TECHNICAL SPECIFICATIONS

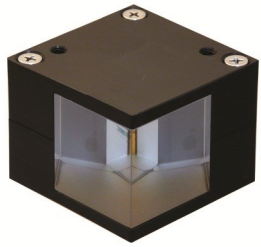
Beam diameter at exit	13 mm
Beam diameter at maximum range	45 mm
Operating range	300 m
Output power	3 mW
Laser source	Laser diode, red beam, 658 nm
Laser class	2M
Batteries	4 x ‘D’ cell batteries
Operating time	300 hrs (with alkaline batteries)
External power supply	6 - 12 V DC
Length	460 mm
Diameter	60 mm
Weight	2.4 kg with batteries 2.1 kg with dummy battery
Operating temperature	–20°C to +50°C

7. OPTIONAL ACCESSORIES

Gimbal Bracket
A.60.004

The gimbal bracket allows secure mounting of the laser unit through 2 x 1/2 inch mounting holes or through a central 5/8 inch mounting thread.

The bracket allows fine adjustment of the laser beam in 2 axes through use of 2 fine adjustment screws.



Penta Prism
A.MCE.029

This 90 degree penta prism is an optical device used to bend the laser beam by 90 degrees regardless of the angle of input of the beam.

The penta prism should be mounted on an approved bracket or holder.

Rubber Bumpers
A.60.001

The rubber bumpers fit tightly onto the ends of the laser unit providing protection for the laser's metal casing.

Dummy Battery A.MCE.067
Input Connector A.MCE.066

The dummy battery and the input connector are used to operate the laser unit through an external power supply.

Power Cord A.RS.001

The power cord is used in conjunction with the dummy battery and the input connector to operate the laser unit through an external power supply.