



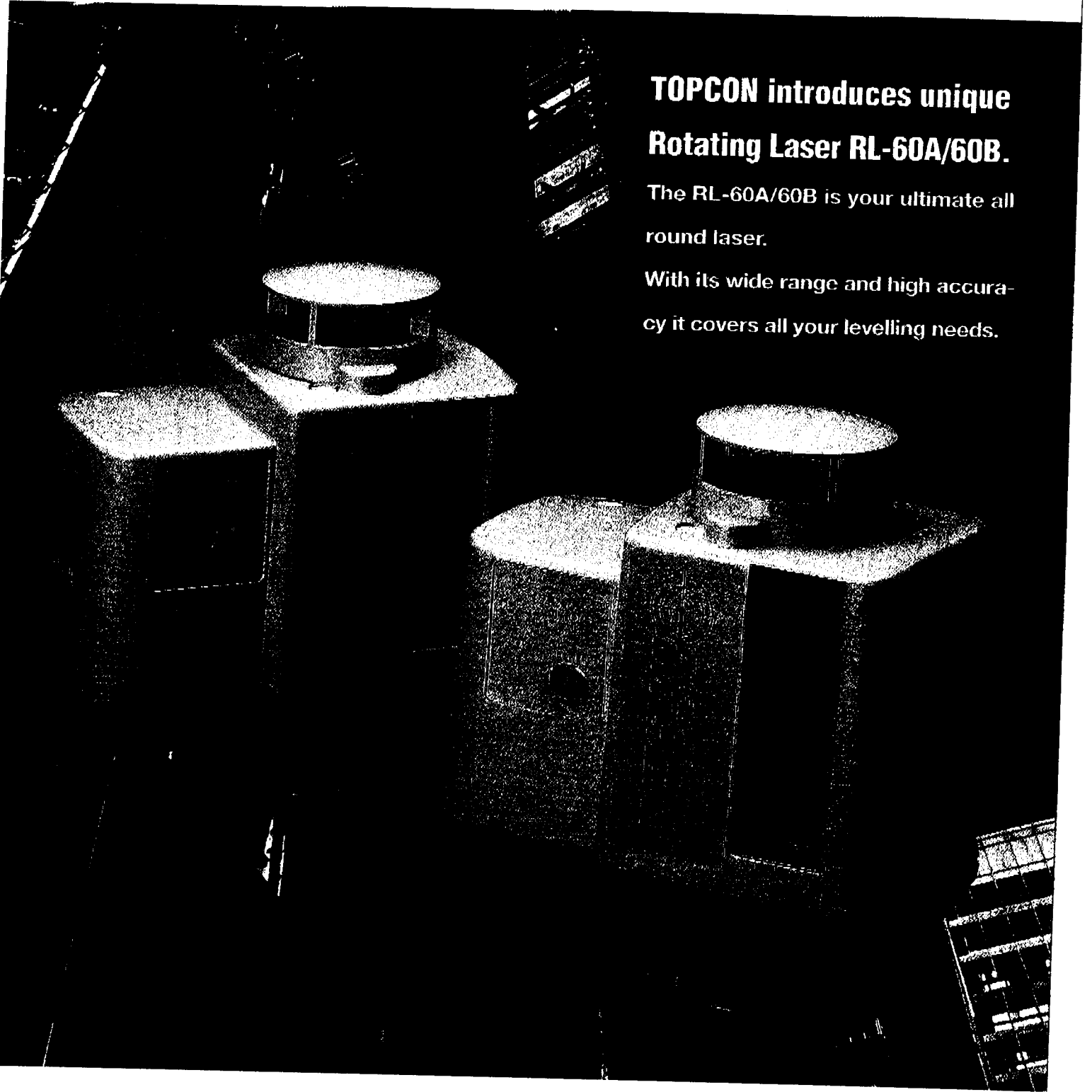
**ROTATING LASER**

# **RL-60A / 60B**

**TOPCON introduces unique  
Rotating Laser RL-60A/60B.**

The RL-60A/60B is your ultimate all  
round laser.

With its wide range and high accuracy  
it covers all your levelling needs.



## FEATURES *RL-60A/60B has unique features to help get your work done quickly, easily, accurately and affordably.*

### LONGER MEASUREMENT RANGE

RL-60A can cover measuring range of 600m and RL-60B can cover 300m with LS-50B.

### DUSTPROOF & WATERPROOF CONSTRUCTION FOR OUTDOOR USE

### LONGTIME OPERATION

### LIGHT WEIGHT (2.0kg), PORTABLE & LOW COST ROTATING LASER

### HIGH SPEED ROTATION

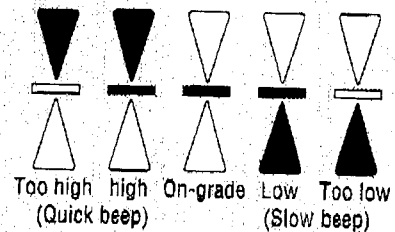
The rotational speed of the laser is 600 r.p.m.

### AUTOMATIC LIQUID COMPENSATOR

The liquid compensator is designed to deliver maximum stability working around construction equipment and job site conditions. It is shock resistant, making it more durable than traditional wire-hung compensators with multiple moving parts which are more susceptible to friction and resistance.

### 5 CHANNEL RECEIVING SENSOR

LS-50B displays beam position with 5 channel indication and louder sound.



### Instrument RL-60A/60B

Accuracy	RL-60A: $\pm 10''$ ( $0^{\circ}\text{C} \sim 50^{\circ}\text{C}$ ) $\pm 15''$ ( $-20^{\circ}\text{C} \sim 0^{\circ}\text{C}$ ) RL-60B: $\pm 15''$ ( $0^{\circ}\text{C} \sim 50^{\circ}\text{C}$ ) $\pm 20''$ ( $-20^{\circ}\text{C} \sim 0^{\circ}\text{C}$ )
Measuring range with LS-50B (Diameter)	RL-60A: 600m RL-60B: 300m
Rotational speeds	600 r.p.m.
Automatic correction range	RL-60A: $\pm 7'$ , RL-60B: $\pm 10'$
Power supply	Three (3) R20P type dry batteries or Ni-Cd rechargeable battery BT-34Q
Continuous operating time	Approx. 130 hours at $+20^{\circ}\text{C}$ (Alkaline manganese dry battery) Approx. 60 hours at $+20^{\circ}\text{C}$ (Manganese dry battery) Approx. 35 hours at $+20^{\circ}\text{C}$ (Ni-Cd battery BT-34Q)
Operating temperature	$-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$
Waterproof	IPX6
Dimensions	195(L) $\times$ 125(W) $\times$ 223(H)mm
Weight	2.0kg (including 3 batteries)

\* Design and specifications herein are subject to change without notice.

In order to obtain the best results with this instrument, please be sure to review all user instructions prior to operation.



75-1 Higashinuma-cho, Heiwajuku, Tokyo 174-0850, Japan Phone: 8-3650-0800 Fax: 2-3980-4214 www.topcon.co.jp

#### TOPCON POSITIONING SYSTEMS, INC.

5736 West Las Posas Blvd., Pleasanton, CA 94688, U.S.A.  
Phone: 925-460-1300 Fax: 925-400-1315 www.topcon.com

#### TOPCON CALIFORNIA

3380 Industrial Blvd., Suite 105, Wheel Sacramento, CA 95691, U.S.A.  
Phone: 916-374-2025 Fax: 916-374-8529

#### TOPCON MIDWEST

881 Rukin Road, Elk Grove Village, IL 60007, U.S.A.  
Phone: 647-734-1700 Fax: 647-734-1712

#### TOPCON EUROPE B.V.

Enkhuizen 11, 2808 LJ Capelle a/d IJssel, The Netherlands  
Phone: 010-4590077 Fax: 010-4590045 www.topcon-europe.com

#### TOPCON BELGIUM

Pretokker 5, 1796 Morselt, Belgium  
Phone: 059-87-45-45 Fax: 059-97-45-75

#### TOPCON DEUTSCHLAND G.m.b.H.

Waldkamp 180, 45559 Lisdorf, GERMANY  
Phone: 0201-8010-100 Fax: 0201-8519-111 pe@topcon.de  
www.topcon.de

#### TOPCON S.A.R.L.

58, Rue de Paris, 68595 Cléty, Cedex, France  
Phone: 03-1-41068480 Fax: 03-1-47980251 topcon@topcon.fr

#### TOPCON ESPAÑA S.A.

HEAD OFFICE  
Industria Mompou S. ED. Lufa 3, 08950, Sant Joan Despí, Barcelona, Spain.  
Phone: 93-473-4027 Fax: 93-473-3932 www.topcon.es

#### MADRID OFFICE

Avenida Burgos, 18E, 1- 2602B, Madrid, Spain.  
Phone: 91-307-4139 Fax: 91-353-3800

#### TOPCON SCANDINAVIA A. B.

Norrgränd 2 9-43101 Mölndal, SWEDEN  
Phone: 051-710200 Fax: 051-710949

#### TOPCON (GREAT BRITAIN) LTD.

HEAD OFFICE  
Toppcon House, Keston, Side, John Lane, Nawbury, Berkshire RG14 3PX U.K.  
Phone: 44-1835-551120 Fax: 44-1835-051170

Citywide Sales, Slough, U.K. Email: 23@topcon.co.uk

#### TOPCON SINGAPORE PTE. LTD.

Blk 182 Pasir Ris, Pasir Ris Industrial Complex, 407-01, Singapore 120391  
Phone: 2765222 Fax: 2765540 www.japan.com.sg

#### TOPCON AUSTRALIA PTY. LTD.

405 Victoria Road, Gladstone, QLD 4711, Australia  
Phone: 05-9611-4669 Fax: 05-9617-4654 www.topcon.com.au

#### TOPCON INSTRUMENTS (THAILAND) CO., LTD.

77/102 Siam Barohn Tower 3/F, P.O.  
Klongthongburi Rd., Klongthong, Klongthong, Bangkok 10600 Thailand  
Phone: 082-140 1152-7 Fax: 062-440-1130

### Level Sensor LS-50B

Detective range	50mm
Detective precision	High precision: $\pm 0.5\text{mm}$ Normal precision: $\pm 1.0\text{mm}$
Detective beam indication	Liquid crystal display and buzzer
Power source	9V manganese dry battery
Operating time	Approx. 50 hours at $+20^{\circ}\text{C}$ (Alkaline manganese dry battery) Approx. 30 hours at $+20^{\circ}\text{C}$ (Manganese dry battery)
The time for auto-cut off	30min. approx.
Operating temperature	$-20^{\circ}\text{C} \sim +50^{\circ}\text{C}$
Dimensions	165(L) $\times$ 78(W) $\times$ 26 (H)mm
Weight	0.25kg (including a dry battery)

#### Laser safety information

This laser complies with all applicable the CLASS 1 of the European Standard EN60825.

• Level Sensor holder, Model 3 to fix LS-50B to the staff or other rod.



TOPCON CORPORATION

#### TOPCON INSTRUMENTS (MALAYSIA) SDN. BHD.

1st 226 Jalan Masjid 2, Pusat Bandar Tunjua Malawati,  
13700, Kuala Lumpur, Malaysia  
Phone: 03-41072801 Fax: 03-41072785

#### TOPCON KOREA CORPORATION

2F Yooeoung Bldg., 1525-3, Bechoo-Dong, Seongbuk-Gu, Seoul, 157-876, Korea  
Phone: 82-2-2093-0321 Fax: 82-2-2093-0318 www.topcon.co.kr

#### TOPCON OPTICAL (H.K.) LIMITED

2/F, Meiko Industrial Bldg., No. 53-55 Au Pui Wan Street, Fa Tin Road,  
Sha Tin, N.T., Hong Kong  
Phone: 2680-1326 Fax: 2680-2221 www.topcon.com.hk

#### TOPCON CORPORATION BEIJING OFFICE

Room No. 802 Poly Plaza Building, 14 Dongzhimen Nandajie,  
Dongcheng District, Beijing, 100027, China  
Phone: 10-6501-4101 Fax: 10-6501-1190

#### TOPCON CORPORATION BEIRUT OFFICE

P.O. BOX 70-1002 Antelias, BEIRUT-LIBANON  
Phone: 961-4-623556/61-4-623526 Fax: 961-4-521116

#### TOPCON CORPORATION DUBAI OFFICE

P.O. Box 22635, 102, Al Naha, Ujda, 245 Abu Hal Road, Umm Al-Qaiwain, UAE  
Phone: 971-4-2699511 Fax: 971-4-2696272

## SECTION 2 LASERS—HAZARDS AND CLASSIFICATION

**2.1 LASERS—GENERAL** Laser devices are sources of light which differ from all other sources of light.

The low-powered lasers used in the construction industry usually emit light in the form of a narrow, concentrated light beam of low divergence (spread). 'Radiation' from the type of lasers used in the construction industry means the light beam emerging from it. The wavelength (colour) of this light (radiation) is usually confined to the visible or to the invisible near infrared parts of the spectrum. X-rays, ultraviolet radiation and microwaves are not emitted from the low-powered lasers used for alignment, levelling, control, and survey tasks in the building and construction industry.

**2.2 LASER HAZARDS—CLASSIFICATION** The system of classification of laser devices is specified in AS 2211. That system of classification ranks the potential hazards of lasers as follows:

- (a) Class 1 lasers are safe for use under all conditions of exposure.
- (b) Class 2 lasers are low-power lasers, the use of which requires some administrative controls but present little hazard, e.g. eye protection is normally afforded by normal blink and aversion responses.
- (c) Class 3A lasers emit higher levels of light, and their use requires more stringent engineering and administrative precautions than those necessary with Class 2 in order to ensure they are not used with optical instruments (e.g. a builder's level or theodolite), which would concentrate the beam so that it would all enter the eye.
- (d) Class 3B (Restricted) lasers operate at the same power levels as Class 3A, but have higher levels of irradiance (power density). They shall not be used in dimly lit building or construction applications.
- (e) Class 3B lasers emit either invisible or visible radiation potentially hazardous to the eye and skin. Consequently, use of these lasers is not permitted for building or construction tasks.
- (f) Class 4 lasers are high-power devices capable of producing diffuse reflections hazardous to the eye; skin exposure to the direct beam of a Class 4 laser is also hazardous. Consequently, use of these lasers is not permitted for building or construction tasks.

**2.3 LASER HAZARDS—GENERAL** A full explanation of the biological damage mechanisms are detailed in Appendix B of AS 2211.

Lasers used for surveying, levelling, control or alignment tasks in the building and construction industry should—

- (a) if of the 'invisible beam' type, be of the Class 1 type; and
- (b) if emitting visible light, be preferably Class 1 or Class 2 lasers.

Notwithstanding the preference in (b), Class 3A lasers, or, where the lighting level is suitable Class 3B (Restricted) lasers, which are both higher powered than Class 2 but have restricted power densities, may also be used for these tasks, provided the additional engineering and administrative controls listed in this Standard are enforced.

Class 3B other than Class 3B (Restricted), and Class 4 lasers shall not be used for these tasks.

**NOTE:** Use of Class 3B, other than 3B (Restricted) and Class 4 lasers is not covered in this Standard. Their use for other applications outside the building and construction industry requires

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## SECTION 4 SAFETY RULES AND PRECAUTIONS

**4.1 CLASS 1 LASERS** Class 1 lasers, by virtue of the emission limitations placed upon them in AS 2211, are safe under all conditions.

However, persons operating Class 1 lasers should comply with the manufacturer's directions relating to proper use and care of the laser product. Such persons should also be aware of any special warnings issued by the manufacturer relating to maintenance adjustments or repairs to the products.

Accordingly, there are no special safety requirements to be observed in the use of Class 1 lasers.

**4.2 CLASS 2 LASERS** Class 2 lasers, by virtue of the emission limitations placed upon them in AS 2211, are generally incapable of causing eye injury within the duration of the blink or aversion response.

A hazard may, however, exist if a person deliberately overcomes his natural aversion to bright light and stares directly into the beam. The safety rules to be observed in the use of Class 2 lasers are as follows:

- (a) The laser shall be used and maintained in accordance with the manufacturer's instructions.
- (b) Where prolonged or momentary access to the beam is possible, area warning signs of the relevant type specified in Appendix A for Class 2 lasers shall be displayed in conspicuous locations both inside and outside the work area and on doors giving access to the area.
- (c) The laser beam shall not be deliberately aimed at personnel and shall be prevented from being directed towards the eye of a person for longer than 0.25 s.
- (d) Lasers of the 'fixed beam' type, i.e. non-rotating, shall be terminated to prevent the beam extending beyond the boundary of the operational area. The beam stop shall be made from a suitably sturdy and rigid material. It should not be transparent and it should not produce unwanted specular reflections (a matt surface finish is usually required). Earth walls, wood, plywood, brick, mortar, concrete and plaster board are all excellent beam stop materials. If metal beam stops are used then care should be taken to ensure that the surface is suitably roughened and coated to prevent unnecessary specular reflections.

**4.3 CLASS 3A LASERS** Class 3A lasers may present a potential for eye injury due to—

- (a) intrabeam (direct) viewing when using optical instruments;
- (b) reflection from flat mirror-like (shiny) surfaces when using optical instruments; or
- (c) deliberate suppression of the aversion response to bright light, i.e. blink reflex, by any person.

Class 3A lasers do not represent an eye hazard from a diffuse reflection (i.e. flat, non-shiny surface) even if optical instruments are used, nor a skin or fire hazard for unintentional exposure.

Hence the control measures, precautions and rules which should be observed in the use of Class 3A lasers are generally aimed at eliminating the possibilities of intrabeam or specular reflection viewing with optical instruments. These measures include the following:

- (i) A responsible person shall be appointed as a LSO to assess and implement controls appropriate to the Class 3A laser.