AGATEC

Construction Lasers

LT300 Laser Level
Owner's Manual

GENERAL INFORMATION

Thank you for buying the LT300! Although it is very simple to use, we recommend that you read this manual before operating the laser.

Description

The LT300 is a visible laser that can be used for leveling, vertical alignment & squaring. It's totally waterproof and also has scanning and constant squaring for interior jobs. Other advanced features include: totally automatic self-leveling in both horizontal and vertical modes; electronic calibration by the user; and optional remote control.

<table>
<tr><td>⚠</td><td>Caution/Certification Label
Class 3R Laser Product
Wave length 630-680 nm
Max. Output Power 5mW
Laser Light: Avoid direct eye exposure
Conforms to IEC 60825-1; 2001
Complies with 21 CFR 1040.10 and 1040.11 except for deviations
Pursuant to Laser Notice No. 50
Dated July 26, 2001</td></tr>
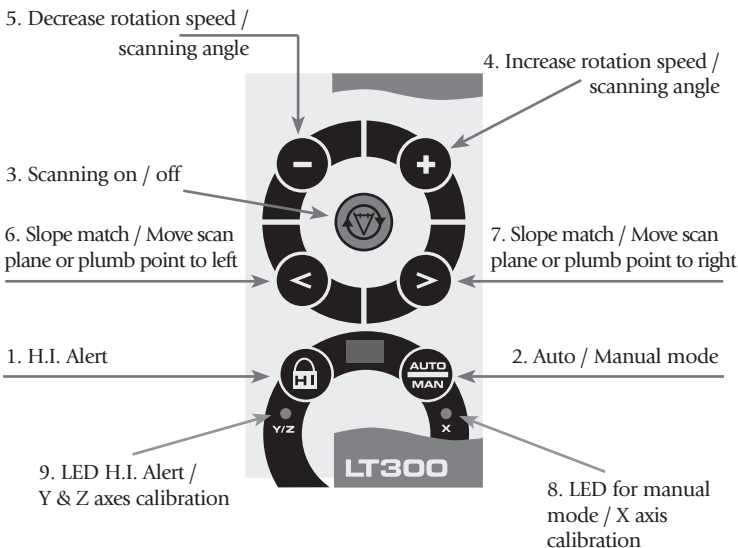</table>

Specifications

Recommended use	1,000 ft. (300 m) diameter
Accuracy	± 1/8" @ 100 ft. (± 3 mm @ 30 m)
Self-leveling range	± 8%
Rotation speeds	0, 90, 150, 300, 450, 600 rpm
Scanning lengths	From 2 to 35°
Slope match	5° on both X & Y axis; also, semi-automatic mode with Y in manual, X in automatic
Laser battery	NiCad rechargeable
Charging time	15 hours
Battery life	40 hours
Operating temperature	14˚ to 122˚ F (-10˚C to 50˚C)
Dimensions	5″ x 4 1/2″ x 8 1/2″ (12.5 x 11.5 x 21.9 cm)
Weight	7 3/4 lbs. (3.5 kg)
Environmental	IP67
Laser diode	635 nm, visible, <5mW IEC/CDRH: Class 3R

Laser Overview

1. Rotating laser beam (head enclosed in glass lighthouse)

2. Non-rotating laser beam for plumb, squaring, or pipeline

Safety Label

Avoid exposure. Laser light is emitted from this aperture.

Caution/Certification Label (see previous page)

LT300

7. Laser keypad

3. Charger jack

6. Adjustable feet for vertical setup

5. On/Off

4. Bubble vial for vertical setup

Keypad Overview

5. Decrease rotation speed / scanning angle

4. Increase rotation speed / scanning angle

3. Scanning on / off

6. Slope match / Move scan plane or plumb point to left

7. Slope match / Move scan plane or plumb point to right

1. H.I. Alert

2. Auto / Manual mode

9. LED H.I. Alert / Y & Z axes calibration

8. LED for manual mode / X axis calibration

LT300

How To Use The LT300

Setup

Horizontal
The laser can be used on a 5/8-11 tripod, on a wall mount, or directly on a solid, stable surface.

Vertical
The laser can be placed directly on a solid, stable surface.

Place the laser on the side with the two adjustable feet (6). Rough level the laser by using the feet to center the bubble in the vertical vial (4).

The LT300 has a wide self-leveling range; however, if the laser is set up out of the leveling range, laser beam will continue to blink and rotation will not start.

Turning On the Laser

Turn on the laser with the On / Off key (5). It does a self-test and the beam blinks while the laser is self-leveling. After it's leveled, the head rotates.

Automatic/Manual Mode

The laser is in automatic self-leveling mode when turned on.

To put in manual mode, press (2) on the laser keypad. The LED indicator (8) located near the Auto/Man key will blink to remind you that the laser is in manual mode.

You cannot use H.I. Alert in Manual Mode.

CAUTION: In manual mode, the beam rotates even if the laser is not leveled.

H.I. Alert

H.I. (height of instrument) Alert stops the laser automatically if the laser is disturbed or moved, preventing inaccurate readings.

It will function only when selected. To activate this safeguard feature, press the H.I. key (1). The LED indicator (9) will blink rapidly while the laser is self-leveling.

About 30 seconds after the head starts to rotate, the LED will blink slowly, indicating the H.I. alert is activated.

If the laser is disturbed while in H.I. Alert mode, the head will stop rotating, the beam will turn off, and the LED will stay on.

To start the laser rotating again, press On/Off twice.

Check if the beam elevation has changed from its original benchmark position.

The laser is no longer in H.I. Alert mode. Press key (1) to return to H.I. Alert.

Rotation

Rotation Speed
The head rotates at 6 speeds: 0, 90, 150, 300, 450, and 600 rpm. 300 rpm is the default setting.

Using the keypad or remote, you can stop the rotation with the - key and move the beam point with the + or - keys.

To start the rotation again just press the + key for a few seconds.
Press the + to increase the rotation or - to decrease the rotation speed.

The laser beam is more visible at slower rotation speeds. The faster speed (600 rpm) is required for many machine control receiver applications.

> *It is important to check while you're using the laser that it has not been moved and that your setting is still accurate.*

Scanning

Scanning mode allows you to see the beam easier at a distance.
To switch from rotation to scan, press the scanning key (3).

Use the + or - keys on the keypad to change scan lengths.

Hold down the < or > arrows to move the scan left or right.

To stop scanning, press again on the scanning key (3).

Slope Match

The laser can be used to match manual slope on both
X and Y axes. Two modes are available:

- Complete manual mode: X and Y axis will be both manual
- Semi-automatic mode: X in automatic / Y in manual.

+Y

-X (○) +X

-Y

Front of laser
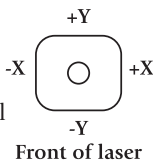
Semi-Automatic Mode

Set the laser over a start point. Turn the laser so that the back of the laser, +Y,
faces the direction of the slope (and -Y faces away). Use the sighting groove
on the top of the housing to roughly align the Y axis of the laser to the
second point.

After turning the laser on and allowing it to self-level, hold the Auto/Man
key for a few seconds until the LED below it (8) is lit continually. The laser is
in automatic self-leveling mode in X axis, and manual mode in Y axis. Press
< on the keypad or remote to match a positive slope in Y and > to match a
negative slope. The X axis will stay level.

Press twice on the Auto/Man key to return to the automatic mode.

Manual Mode

Set the laser over a start point. Turn the laser so that +X faces the direction
of the slope (and -X faces away). Use the sighting groove on the top of the
housing to roughly align the X axis of the laser to the second point.

After turning the laser on and allowing it to self-level, press the Auto/Man
key. The LED below it (8) will blink, indicating you're in manual mode and
can match slope in the X axis. The head will start rotating.

Press < on the keypad or remote to match a positive slope in X and > (9) to
match a negative slope.

To switch to the Y axis, press the H.I. key. Both LEDs (8 and 9) will blink, indicating you're in manual mode and can match slope in the Y axis. *Note:* The Y axis grade will be at a 90 degree angle from the X axis grade output. Press < to match a positive slope in Y and > to match a negative slope.

Press the Auto/Man key to return to automatic mode.

Caution: In manual mode, the beam rotates even if the laser is not leveled. The H.I. Alert function is not available when the unit is in manual mode.

Adjusting Beam Left or Right

After placing the laser in vertical position (see Setup section), the plumb beam out the top of the head can be moved to the left or right, using the < or > keys. This is necessary to do squaring for installing walls and partitions.

Batteries

Laser Battery
The LT300 has a NiCad rechargeable battery that should be charged for 15 hours before first use.

Charging the Battery

1) Remove the charging connector cover on the side of the laser. Insert the charger plug and fully engage the threads.

2) Plug the charger into an electrical outlet (110 volts or 220 volts, depending on charger and country).

3) Charge for 15 hours. When the charger is plugged in, a red light will illuminate on the charger.

The LT300 can be charged while working. If electricity is available on the job site, simply plug in the charger and keep on working.

For optimum life of the battery, it is recommended to charge the battery after fully discharged. To assure battery life, do not charge over 20 hours.

*Although the LT300 is waterproof,
do not charge it while it is in water or submerged.*

Checking and Adjusting the LT300

THIS CHAPTER IS VERY IMPORTANT: Here are a few simple instructions to check your laser for calibration. Remember that the laser is a precision instrument and it is important that you keep it calibrated and in proper condition. The accuracy of your work is completely your responsibility and you should regularly check your instrument, especially prior to important jobs.

How to Check and Calibrate

The laser has 3 axes: X and Y (horizontal) and Z (vertical).

Front of laser
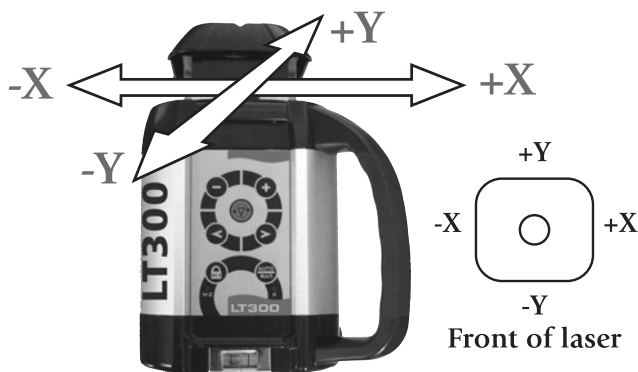
Each axis must be checked for calibration. If needed, the axis can be calibrated, carefully following the instructions. You may also take the laser to a service center for calibration.

Check and calibrate in this order:

Check both sides of X axis.
- If X is within spec, proceed to check both sides of Y.
- If X needs calibration, calibrate X.

Check both sides of Y axis.
- If Y is within spec, proceed to final X to Y check
- If Y needs calibration, calibrate Y; proceed to X to Y check

Final X to Y check: compare +X, -Y, -X, +Y

Check Z and calibrate if necessary

Calibration Overview

Calibration is electronic, using the optional detector/remote control or the small remote control (preferred method).

If you do not have a remote, the laser keypad may also be used. This method will take longer due to the laser making self-adjustments during movement. Be very careful not to jar or move the laser when pushing the laser keys, or your calibration will not be accurate.

Fast/Slow Blinking

When in calibration mode, the X or Y/Z LED on the laser keypad should blink slowly.

When the laser is self-leveling or making an adjustment, the LED will blink rapidly. Wait until the LED blinks slowly again before proceeding.

Moving the Beam to Calibrate

When pressing an arrow key to move the beam up or down to reach proper calibration, use short, rapid clicks. Do not hold the key down. After pressing the key, the LED will blink rapidly as the laser reacts. Wait until the LED returns to a slow blink to proceed.

Use the ∧ or ∨ keys on the remote (< or > on the laser keypad) to move beam up or down to the calibration target. If the +X axis is toward the wall with the marks, use the ∧ key (<) to raise beam, and the ∨ key (>) to lower beam. If the –X axis is toward the wall, it's the opposite: use the ∨ key (>) to raise the beam and the ∧ key (<) to lower the beam.

**Keys used on detector/remote control
when laser is in calibration mode**

Use arrows to move beam up or down to reach proper calibration.

If using a TL25 remote control, keys with the same symbols perform the same functions.

Change from X to Y axis

Save calibration

Starts rotation (in calibration mode)
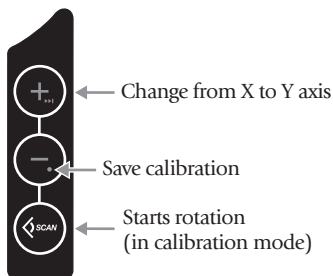
Checking & Calibrating X & Y Axes

1) Place the laser on a flat surface or tripod 100 ft. (30 m) away from a wall. If too bright to see the beam, use a detector with a pole or grade rod. Position so that -X is facing the wall (this is the side of the laser with the On/Off key). Use the sighting groove on top of the instrument for alignment.

2) Hold AUTO/MAN key. While holding, momentarily press the ON key.

   Look for:
   Y/Z LED flashes, then X LED flashes. Release Auto/Man key.

   X LED will blink rapidly, indicating leveling. When the LED blinks slowly, the laser is ready to verify X axis calibration.

3) To rotate laser beam: Press SCAN key on the remote (or press the rotation key on the laser keypad).

4) Check X calibration:
   a) With detector, mark center of the beam (-X).
   b) Rotate laser 180° so +X is facing wall or pole.
   c) With detector, mark center of the beam (+X).
   d) At 100 ft., the two marks should be no more than 1/4" apart. (At 30 m, no more than 6 mm apart.) If the marks are close enough, X axis is within calibration; proceed to Step 6.

5) If not, the laser must be calibrated to bring the beam to the center of the two X marks. Use the ∧ or ∨ keys on the remote (< or > on the laser keypad) to move beam up or down to the calibration target.

Note: With the arrow keys, make small inputs: one click, two clicks, three clicks, etc. Do NOT hold key down.

6) After calibrating X, check Y. Rotate laser 90° degrees so that -Y is facing the wall (this is the side of the laser with the keypad).

7) Select the Y axis by pressing the double arrow key (>>|) on the remote (or the HI key on the laser keypad).

   Look for:
   Y/Z LED blinking rapidly, indicating leveling. When the LED blinks slowly, the laser is ready to verify Y axis calibration.

8) Check Y calibration:
   a) With detector, mark center of the beam (-Y).
   b) Rotate laser 180° so +Y is facing wall.
   c) With detector, mark the center of the beam (+Y).
   d) At 100 ft., the two marks should be no more than 1/4" apart.
      (At 30 m, no more than 6 mm apart.) If the marks are close enough,
      Y axis is within calibration; proceed to Step 10.

9) If not, the laser must be calibrated to bring the beam to the center of
   the two Y marks. Use the ∧ or ∨ keys on the remote (< or > on the laser
   keypad) to move beam up or down to the calibration target.

10) Final X to Y check: compare X to Y axes to be sure that your adjusted
    calibration is within specification of ± 1/8" at 100 ft. (± 3 mm at 30 m).
    Turn the laser 90° each time; the marks for +X, -Y, -X, +Y should not be
    more than 1/4" (6 mm) apart.

11) Press the key on the remote with the small dot to save the calibration
    (or press the Auto/Man key on the laser)

*If you are not sure of the calibration and do not wish to save it, do not press the
small dot, and turn the laser off with the On/Off key.*

Checking Z Axis

1) Place the laser in vertical mode on a solid, stable surface about 20 ft.
   (6 m) away from a plumb line (plumb bob or heavy object hanging on
   a string, at least 8 ft. (2.5 m) high. You will be comparing the rotating
   beam to the plumb line. If you need to calibrate, the beam will be easier
   to see in a darkened room.

2) Rough level the laser using the adjustable feet to center the bubble in
   the vertical vial.

3) Level the laser longitudinally with a bullet level.

4) Turn on the laser.

5) Use either scan or rotation mode. Using the scanning beam is easier,
   but if you cannot see the beam, work in rotation mode with a detector.

6) Move the scan to the wall over the plumb line, sliding the laser left or
   right to line up the beam over the plumb line. If in rotation mode, use
   the < or > arrows to move the beam.

7) Move the scan up and down the entire length of the plumb line. If the beam is slanted, and not vertical like the plumb line, the Z axis needs to be calibrated.

Calibrating Z Axis

The laser must be calibrated to bring the rotating Z beam parallel to the plumb line.

1) Turn off the laser. Press and hold the Auto/Man key on the laser.

2) Hold AUTO/MAN key. While holding, momentarily press the ON key.

   Look for:
   Y/Z LED flashes, then X LED flashes. Release Auto/Man key.

   Y/Z LED will blink rapidly, indicating leveling. When the LED blinks slowly, the laser is ready for Z axis calibration.

3) Use the arrow keys to align scanning beam with string plumb line.

4) Move the beam slightly so that the beam is over the plumb line for the final check.

5) Press the small dot key on the remote to save calibration. The beam will go off.

Cone Error Checking

1) Set up the laser about 2 ft. (60 cm) away from a wall (a) or pole and 100 ft. (30 m) from another wall (b) or pole.

2) Turn the laser on. After it has self-leveled, mark the location of the beam on the near wall (a). Always mark the center of the beam. If it's too bright to see the beam, use a detector.

3) Rotate the laser 180°. Mark the location of the beam on the far wall (b).

4) Now set up the laser about 2 ft. (60 cm) away from the far wall. Mark the beam (b′) near the first mark (b).

5) Rotate the laser 180°. Mark the location of the beam on the other wall (a′), near the first mark (a).

6) Compare the two sets of marks on the walls. If the difference between aa′-bb′ exceeds 1/4" (6 mm), contact your local service center.

Care and Handling

CAUTION
Use of control or calibration procedures other than those specified here in may result in hazardous radiation exposure.

1) The LT300 is a precision instrument that must be handled with care. Avoid shock and vibrations.

2) After use, it's recommend that you wipe the laser dry and store in a dry place. Do not store the laser in its case if the laser or the case are wet.

3) Do not store the laser at temperatures below -4°F (-20°C) or above 176°F (80°C); the electronic components could be damaged.

4) To maintain the precision of your laser, check and adjust it regularly.

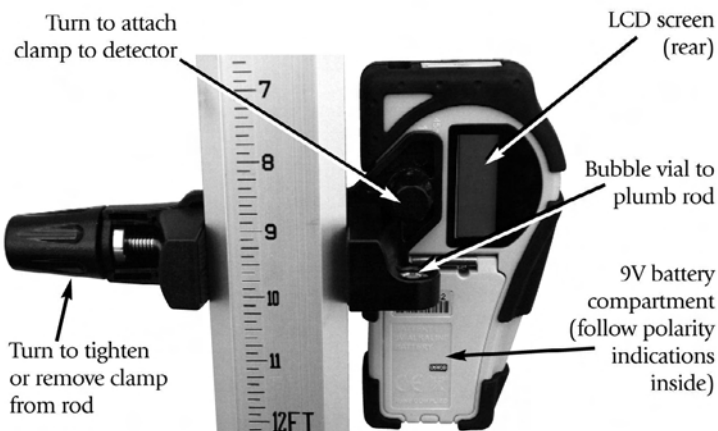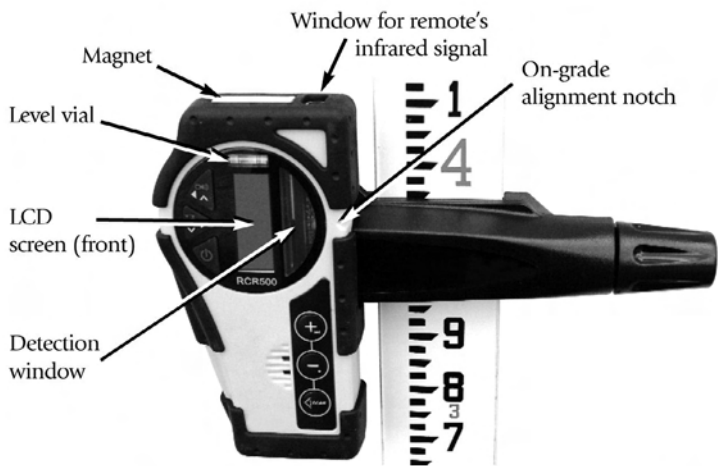5) Keep the glass lighthouse of the laser clean with a soft cloth and glass cleaner.

Warranty

Your LT300 laser is guaranteed to be free of manufacturing defects for a period of one year. Any abnormal usage, or if the instrument has been subjected to shock, will void this warranty. Under no circumstances will the liability of the manufacturer exceed the cost of repairing or replacing the instrument.

Disassembling the laser by other than qualified technicians will void the warranty. Specifications are subject to change without notice.

ACCESSORIES

Combination detector and laser remote control

For grade rod or handheld applications. Also can use the magnet mount to attach to metal studs for exterior curtain wall alignment or to ceiling grids for acoustical ceiling leveling.
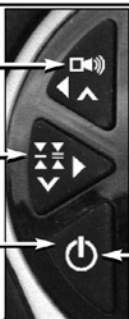

Magnet

Window for remote's infrared signal

Level vial

On-grade alignment notch

LCD screen (front)

Detection window

Turn to attach clamp to detector

LCD screen (rear)

Bubble vial to plumb rod

9V battery compartment (follow polarity indications inside)

Turn to tighten or remove clamp from rod

Upper Keypad

Detector mode (red keys)	Remote mode	Scanning mode
Choice of sound level	◀ Move square shot to the left (vertical mode)	Aim scanning left
Choice of accuracy	▶ Move square shot to the right (vertical mode)	Aim scanning right
On/Off	Change to remote mode	⌃ and ⌄ are used for calibration or to set manual grade
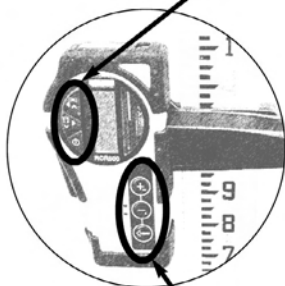
Lower Keypad

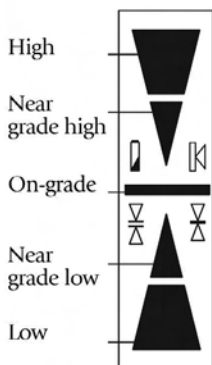|	Remote mode	Scanning mode
+	Increase rotation speed/move non-rotating point right	Increase scanning angle
−	Decrease rotation speed/move non-rotating point left	Decrease scanning angle
SCAN	Start/Stop scanning mode	Start rotation mode

Calibration section of manual explains function of secondary small symbols.

LCD Display

High		
Near grade high		Low battery	**Battery status**
On-grade		Blinking: Normal volume	
Near grade low		Solid: Loud	
Low		No horn: Mute	

Standard   Fine   **Accuracy**

(Default mode)

Using the Detector

1) Press the On/Off key to turn on the detector.

2) Press the middle key to select the accuracy (deadband).

3) Press the top key to select the sound level.

4) Turn the detection window towards the laser beam, and move the detector up or down according to the information given on the LCD display. There are five channels of information, or grade indicators. A down arrow indicates you must move the detector down to reach the laser reference; an up arrow, move it up. When a horizontal line appears on the display, the detector is at the same level as the laser beam.

5) Press the On/Off key to turn the detector off. It will automatically shut off after ten minutes if not used (and give a warning beep).

6) Keep the detection window clean, using a soft cloth and glass cleaner.

Remote control mode

If in detection mode, press On/Off to change to the remote control functions. If the detector is not on, press any key (except the On/Off) to use it as a remote control for the laser.

The remote can be used to stop or start rotation, increase or decrease rotation speed, and move the beam or square shot. It also controls scanning and electronic calibration.

Specifications:

Range*	500 ft. (150 m) in detection mode;
	100 ft. (30 m) in remote mode
Accuracy*	Fine: ± < 1/16″ (1 mm)
	Standard: ± 1/8″ (2.5mm)
Battery life	50 hrs; 9V alkaline
Environmental	Waterproof (IP66+)
Size	6″ x 3.25″ x 1.5″; .35 lbs.
	(15 x 8 x 3.5 cm; .2 kg)

* Varies with laser used. Actual accuracy depends on beam diameter and distance to the laser.

Tripods

The LT300 laser can be mounted on a 5/8-11 flat head tripod. You can also use a tripod with an elevating column to adjust the height of the laser.

Other accessories

- Laser-enhancing glasses improve the visibility of the laser beam in bright light conditions.

- Red magnetic target improves the visibility of the laser beam in bright conditions. Quickly attaches to any metallic surface.

- SM200 universal mount: Use as wall mount or to set laser in vertical mode on a tripod. Spring-activated mechanism for height changes and quick setups; fine adjustment screw for precise positioning.

WARRANTY

The manufacturer warrants its measuring instruments against all manufacturing defects for a period of one year from date of purchase. If during the warranty period, the product is considered as defective by the manufacturer, the latter will decide whether to repair or exchange the product. The only obligation and sole recourse of the buyer will be limited to this repair or exchange. The manufacturer, the distributor, or the retailer will in no case be responsible for any incident or consequence, damage, etc. relative to the use of those instruments.

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

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