

# Electronic Self-Leveling Horizontal & Vertical Rotary Laser *Model Nos. 40-6526, 40-6529, 40-6544*



# **Instruction Manual**

Congratulations on your choice of this Electronic Self-Leveling Horizontal & Vertical Rotary Laser. We suggest you read this instruction manual thoroughly before using the instrument. Save this instruction manual for future use.

This tool emits one rotating laser beam plus one plumb beam and is ideal for laying out indoor or outdoor construction projects.

This is a Class Illa laser tool and is manufactured to comply with CFR 21, parts 1040 .10 and 1040 .11 as well as international safety rule IEC 285.

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Tinted Glasses		1
Instruction Manual with Warranty Card		1
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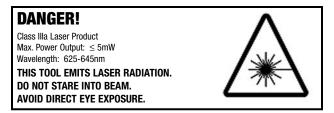
### 2. Features and Functions

- Large electronic self-level range: The unit works when within ±5°. When beyond the ±5° leveling range, the laser beam flashes, rotation of the beam stops, and an audible alarm activates.
- Vertical and horizontal working modes: electronic self-leveling in both horizontal and vertical mode with one rotating laser beam and one 90° split beam.
- Two rotational speeds: 200 and 500 RPM
- Scan function adjusts the scan size and direction.
- Out-of-level alarm ensures the working accuracy.
- Fine self-calibration function
- In "Tilt Mode" the laser will stop rotating and flash when bumped to ensure work accuracy.
- Slope function allows the user to perform slope in both X & Y axis.
- Dust and rain resistant

### 3. Safety Instructions

Please read and understand all of the following instructions, prior to using this tool. Failure to do so, may void the warranty.

#### Model 40-6526 & Model 40-6529

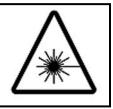




#### Model 40-6544



Class Illa Laser Product Max. Power Output:  $\leq$  5mW Wavelength: 522-542nm THIS TOOL EMITS LASER RADIATION. DO NOT STARE INTO BEAM. AVOID DIRECT EYE EXPOSURE.



### ATTENTION

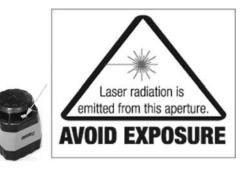


### IMPORTANT

- · Read all instructions prior to operating this laser tool. Do not remove any labels from tool.
- Do not stare directly at the laser beam.
- . Do not project the laser beam directly into the eyes of others.
- Do not set up laser tool at eye level or operate the tool near a reflective surface as the laser beam could be projected into your eyes or into the eyes of others.
- Do not place the laser tool in a manner that may cause someone to unintentionally look into the laser beam. Serious eye injury may result.
- Do not operate the tool in explosive environments, i.e. in the presence of gases or flammable liquids.
- Keep the laser tool out of the reach of children and other untrained persons.
- Do not attempt to view the laser beam through optical tools such as telescopes as serious eye injury may result.
- Always turn the laser tool off when not in use or left unattended for a period of time.
- Remove the batteries when storing the tool for an extended time (more than 3 months) to avoid damage to the tool should the batteries deteriorate.
- Do not attempt to repair or disassemble the laser tool. If unqualified persons attempt to repair this tool, warranty will be void.
- Use only original Johnson<sup>®</sup> parts and accessories purchased from your Johnson<sup>®</sup> authorized dealer. Use of non-Johnson<sup>®</sup> parts and accessories will void warranty.

### 4. Location/Content of Warning Labels





### 5. Location of Part/Components



# 6. Operating Instructions

**IMPORTANT:** It is the responsibility of the user to verify the calibration of the instrument before each use.

#### Notes:

- Always check to make sure that the laser is in the off position (when power indicator lamp is not lit) before removing and replacing batteries.
- Both Ni-MH (40-6529 & 40-6544) and "C" alkaline batteries (included in 40-6526 only) can be used in the unit's battery compartment.

#### Alkaline Battery Installation

Put 4 "C" alkaline batteries into the alkaline battery pack according to polarity direction, then insert the battery pack into the laser.



Insert the rechargeable battery into the laser.



#### Charging the Rechargeable Batteries

Insert the charger into an AC outlet and into the rechargeable battery pack, the rechargeable battery is now charging. The charger indication light is red when it is charging, and it turns green when the battery is full.



Charging directly to rechargeable battery pack



Charging to the laser



#### Note:

When the power indicator light is flashing on the laser, the battery is low. Charge the rechargeable battery every two or three months if the laser will be unused for a long period of time.

#### **Before Using Your Laser**

When you charge the new battery or one which has not been used for long periods of time, it may not reach full charge until after you have discharged it fully in use and recharge it several times.

#### Instrument Usage

- Put in Ni-MH rechargeable battery pack, or 4 "C" alkaline batteries (not included, except in 40-6526), or connect the 6.4V DC battery adapter to the unit's power jack.
- 2. Place the laser on a platform or tripod, connecting with tripod to the 5/8" screw thread at the bottom of the instrument.

**Note:** If the laser is inclined beyond the self-leveling range, the laser will deliver an audible alarm. You will need to re-position the laser inside of its self-leveling range.

 Press power button to turn power on, and press operation buttons on control panel or use remote control (not included with 40-6526)

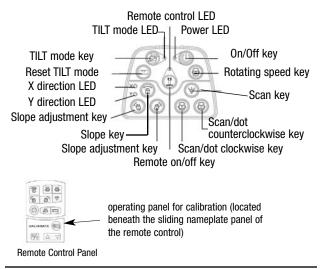
to adjust to your desired working status. (Note: Remote will  $\underline{not}$  power unit  $\underline{on.}$ )

4. After finishing operation or before moving the instrument, turn the power off.

## 7. Using the Product

Place the unit on a relatively level surface like a tripod, floor, etc during operation.

### **Operating Panels**



#### Power On/Off

- 1. Press the power button to power on. The power indicator LED will light up and the instrument will automatically level itself, with rotation occurring once the unit is level.
- Press the power button again to power off.
- 3. Pressing the red power button on the remote will power down the laser beam and rotating beacon, but does not power off the laser. The power indicator LED will flash twice.

#### Low Battery Indicator

If the battery indicator LED is blinking, it means the battery is low. To ensure operation, replace batteries or charge the rechargeable Ni-MH battery pack.

#### Alarm If Beyond Range

If the laser is inclined beyond its auto-leveling range of ±5°, it will deliver an audible alarm, rotation will stop and the laser beam will flash. You will need to re-position the laser within its self-leveling range.

#### Tilt Mode

After turning on the laser, the laser will self-level and begin to rotate. The TILT symbol LED will blink for 30 seconds after the laser begins to rotate. During these 30 seconds if the laser is moved, the laser will stop rotating, re-level and begin to rotate again. After 30 seconds, the TILT symbol LED will stop blinking and will become solid. If the laser is moved when the TILT symbol LED is solid, the laser will stop rotating. The laser beam will blink on and off and the TILT symbol LED will blink guickly alerting the user that the height of instrument may have been changed. Pressing the level vial button





on the laser keypad or remote will allow the laser to re-level and start rotating again and the TILT mode will repeat.

### Speed Adjustment

After unit electronically self-levels, it rotates at its highest speed (500rpm). Press the speed adjustment button (see figure) on either the laser keypad or remote to change the rotating speed to its low speed (200rpm).

Note: During the self-leveling sequence, this key is not functional.

#### Scan Mode

- 1. Press the scan mode button (see figure) on either the laser keypad or remote to activate scan mode.
- 2. With the second press of this button, the unit emits a shorter bright laser line.
- 3. With the third press of this button, the unit emits a bright laser point.
- 4. To return to rotating, press the speed adjustment button.

#### **Rotating the Scan Line**

- 1. Press the clockwise button on either the laser keypad or remote and the scan line moves to the right.
- 2. Press the counter-clockwise button and the scan line moves to the left.

#### **Slope Mode**

 Press the slope mode button once (see figure) on either the laser keypad or remote to enter into the X-direction slope mode. The X LED will turn on. This will put the laser into dual axis slope mode and the self-leveling motors will be turned off.

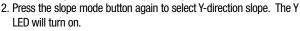








- Press the button pointing to the left to shift the slope angle down to the left facing the laser.
- Press the button pointing to the right to shift the slope angle down to the right facing the laser.



- Press the button pointing to the left to shift the slope angle down to the front of the laser facing the laser.
- Press the button pointing to the right to shift the slope angle down to the back of the laser facing the laser.
- 3. Another press of the slope mode button changes back to X-direction slope selection. Pressing and holding the button returns the unit to normal operation.
- 4. Hold the slope mode button in for three seconds to enter single slope mode. X is the default axis. The X-axis LED is on and the Y-axis LED is flashing. Push the slope button again to slope the X-axis. The laser will continue to self-level in this mode. Pressing and holding the button returns the unit to normal operation.

#### Notes:

- When the unit is in TILT mode, pressing the slope mode button and entering the dual axis mode will exit you from the TILT mode and go into the slope mode.
- When using the laser in the single slope mode, the slope feature can be used and the laser is self-leveling. When using the slope mode in X-direction the X-axis LED is on and the Y-axis LED is flashing. When the laser is positioned on its side in the vertical mode, the vertical laser line can be moved to the left or right.



#### **Timed Auto-off Function**

Turn the unit on using the power button on the laser keypad. Press the power button once on the remote control. The unit is now in sleep mode. The rotating beacon and laser beam will be powered down.

If the unit is in sleep mode for 30 continuous minutes, the unit turns off automatically. With a second press of the power button on remote control, the unit exits sleep mode and enters self-level mode.

#### **Remote Control Shield Key**

The remote control function is on when the laser is turned on and the remote control LED is on. Press this key and the



remote control LED goes off. The laser does not receive a remote control signal.

#### Using the Laser in the Vertical Mode

Set the laser on a flat surface with the keypad facing up.

#### **Detector Usage**

For use outside or in areas with heavy ambient lighting.

The 40-6715 (model 40-6529 only) laser detector is an indispensable accessory when using rotary laser levels. The main function of the detector is to detect the position of the laser signals that are transmitted by rotary lasers. This detection quickly and precisely provides the user with the horizontal and vertical references.

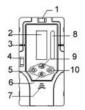
This product features high sensitivity, a double-faced display, low power consumption, good reliability and easy manipulation. It can be used with most types of rotating laser levels.

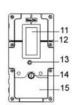
#### 1. Technical Specifications

Detecting accuracy:	Fine: ±0.039" (±1mm)
	Coarse 1: ±0.098" (±2.5mm)
	Coarse 2: ±0.394" (±10mm)
Automatic Shut-off:	6 minutes ±1 minute
Power Supply:	9V battery, 30 hrs continuous use
	(with LCD illumination off)
Sound indicator:	slow short beep, rapid short beep and continuous sound
LED display:	down arrow, up arrow, horizontal on grade bar
Dimensions:	6.30" x 3.35" x 1.10" (160 x 85 x 28mm)
Weight:	1 lb. (0.45kg)
Others:	Rain and dust resistant

#### 2. Components

(a) Exterior Instruction





- 1) Horizontal vial
- 2) Front display window
- 3) Front on grade mark
- 4) Vertical vial
- 5) LED key
- 6) Power key
- 7) Beeper
- 8) Reception window
- 9) Fine/Coarse accuracy key
- 10) Beeper key
- 11) Back display window
- 12) Back on grade mark
- 13) Bracket screw thread
- 14) Battery cover screw
- 15) Battery cover

(b) Display

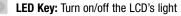


- 1. Power on symbol
- 2. Low battery indicator
- 3. Fine/Coarse symbol
- 4. Beeper symbol
- 5. Position indication arrows



Power Key: Turn on/off the power

Fine/Coarse Accuracy Key: Switch detecting accuracy

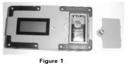


Volume Key: Cycles between high, low and off

#### 3. Operation Guide

- (a) Battery Installation
  - Open the battery cover door by turning the battery cover screw

counter-clockwise. Put the battery into the battery case noting the polarity shown in the battery compartment.

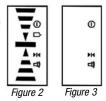


- Put the battery cover door back, and tighten the screw.
- Note: 1) Remove the battery when the unit is being stored for a long time.2) When the low battery indicator is displayed, change the battery soon.

#### 4. Operating Instructions

#### Power On

Press the power key to turn the unit on. The LCD display will illuminate all the indicator segments for 0.5 second (Fig.2). When the indicator segments are no longer illuminated, the detector is ready for use. **Note:** The LCD display will still have the



power, detection and sound indicators illuminated (Fig. 3).

#### Fine/Coarse accuracy key

Power on and press the fine/coarse accuracy key, the unit will cycle between three accuracy options: fine, coarse 1, coarse 2. The accuracy

- W
- H



symbol displayed on the LCD will change.

#### Volume Key

Power on and press the volume key, the unit will cycle between a

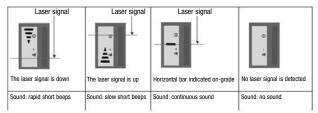
high sound, low sound and mute. The sound symbol displayed on the LCD will change accordingly.



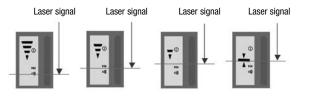
**Note:** There will be two beeps when turning the unit on and off. There will be one beep when changing functions.

#### **Detecting Laser Level Signals**

While detecting laser signals, the LCD will display as follows: (take the set-up state of high sound and fine detection as an example)



When the laser signal is near the on-grade mark, the displayed up and down arrows will decrease as the distance to the on-grade mark decreases.



 When detecting a horizontal laser signal, it is important to have the bubble vial centered, as the deflection of the receiver will influence its receiving accuracy.



- When detecting a vertical laser signal, it is important to have the bubble vial centered, as the deflection of the receiver will influence its receiving accuracy.
- 3. Keep the reception window facing the laser while detecting.
- 4. Hold the unit stable while detecting.

#### LED Function

Power on and press the LED key, the LCD will now be backlit.

#### Automatic Shut-off Function

When the unit does not receive a laser signal for 6 minutes, the unit will power off automatically.

#### Low Battery Display Function

When the battery sign blinks on the LCD, the battery is low and needs to be replaced. If the battery is very low, the unit will power off automatically. Replace the battery.

#### Rod Clamp

Connecting to the rod clamp.

Connecting to the grade rod.

#### 5. Detector Maintenance

 Keep the unit, particularly the reception window, clean. If it does get dirty, use a cloth to wipe it clean.









### 8. Self-Check & Fine Calibration

**IMPORTANT:** It is the responsibility of the user to verify the calibration of the instrument before each use.

It is recommended that the laser must be self-checked before operation. If the accuracy is found beyond tolerance, the user can make fine adjustments according to the directions as follows.

#### X & Y Direction Accuracy Self-Check

- 1. Note the X & Y direction on top of the laser.
- 2. Place the unit on a platform or tripod that is 10' away from one wall and 50' away from another wall indoors, with the X direction facing the wall head-on. Turn the unit on.
- 3. Mark on the wall where the beam hits the short shot (10') and mark it X= and the long shot (50') and mark it X-.
- Turn the instrument 180° being careful not to change the HI (height of the instrument). Mark on the wall short shot X- and long shot X=.
- Measure the vertical distance between X= and X- at the long shot. If X= and X- are more than 1/16" apart at 50', the unit is out of calibration. Note: If there is a vertical distance at the short shot, the HI was changed when the laser was rotated 180°.
- 6. Turn the instrument by 90° and place it on the platform, with the Y-direction facing the wall. Perform Y-direction self-check with the same method as X-direction self-check, and mark point Y- and point Y= by turns.



 If point Y- and Y= are within 1/16" at 50', the accuracy is within tolerance.

#### Fine Calibration Using the Remote Control

The following procedure is only valid when adjusting out errors that are less than 1/2" over 100 ft. Errors larger than 1/2" at 100 ft. must be done by a qualified technician. Reference section 12 for further information.

- 1. Access calibration mode by simultaneously pressing the power 🔘 button and TILT 🖉 button.
- 2. While continuing to hold the TILT button, release the power button until the X and Y LED's blink three times, then release the TILT button.
  - Note, the head of the laser is rotating and the X axis LED is flashing. The unit is now in calibration mode and all other operations will be performed with the unit's remote control (remote control 40-6740 not included in the 40-6526).
- Slide down the lower cover of the remote control to access the operation panel for the calibration. Multiple presses of the X/Y button toggles calibration control between X axis and Y axis (as indicated via the X and Y LED's located on the laser keypad).

 Once the desired axes have been selected, the UP arrow and DOWN arrow buttons are used to adjust the position of the laser plane.

#### **X-Axis Calibration**

- 1. Place the unit into calibration mode as discussed above.
- 2. Position the unit so that the X axis is directed to the two walls.
- 3. Press the X/Y is button on the remote control to toggle calibration control to the X axis.
- Press UP arrow and DOWN arrow buttons, conversely to adjust the laser height to coincide with the zero position of the target. The zero position is half way between X= and X- at the long shot.
- 5. Press the ENTER button on the remote control to accept the calibration value, noting that the X LED goes "OFF".
- 6. After calibration is completed, make sure to power off the unit and then power on again to activate the calibration.

#### **Y-Axis Calibration**

- 1. Place the unit into calibration mode as discussed above.
- 2. Position the unit so that the X axis is directed to the two walls.
- 3. Press the X/Y 🥙 button on the remote control to toggle calibration control to the Y axis.
- Press UP arrow and DOWN arrow buttons, conversely to adjust the laser height to coincide with the zero position of the target. The zero position is half way between Y= and Y- at the long shot.

- 5. Press the ENTER button on the remote control to accept the calibration value, noting that the Y LED goes "OFF".
- After calibration is completed, make sure to power off the unit and then power on again to activate the calibration.

#### **Z-Axis Check/Calibration**

- 1. Place the unit on a level surface with the Y direction facing the far target.
- 2. Mark the wall where the laser hits.
- 3. Turn the laser "OFF" then "ON" again.
- 4. Place the unit so the Z axis is facing the far target.
- 5. Measure the difference between the line and the dot.
- 6. It should be between 3 3/8" and 3-1/2". If it is less the 3 3/8" or greater than 3 1/2", place unit in calibration mode.
- Press UP arrow and DOWN arrow buttons conversely to adjust the laser height to coincide with the zero position of the target.
- 8. Press the ENTER button on the remote control to accept the calibration value, noting that the Y LED goes "OFF".
- After calibration is completed, make sure to power off the unit and then power on again to activate the calibration.

# 9. Technical Specifications

Laser Wavelength	635nm±10nm (Model 40-6526 & 40-6529) 532nm±10nm (Model 40-6544)
Laser Classification	Class Illa
Maximum Power Output	≤5mW
Accuracy	±1/8"/100 ft. (±1mm/10m)
Interior Range	Up to 200 ft. (60m) diameter depending upon light conditions (Model 40-6526 & 40-6529) Up to 400 ft. (120m) diameter
	depending upon light conditions (Model 40-6544)
Exterior Range	Up to 1500 ft. (460m) diameter (40-6526 & 40-6529) with red detector (not included in 40-6526)
	Up to 1200 ft. (365m) diameter with green detector (not included in 40-6544)
Remote Range	Up to 200 ft. (60m) diameter with remote
Slope	±5°
Self-Leveling Range	±5°

Power Supply	Rechargeable NiMH battery pack and 6.4V adapter (included in Model 40-6529 & 40-6544) 4 - "C" alkaline batteries (included in Model 40-6526)
Battery Life	Approx. battery life 24 hours continuous use with rechargeable battery pack, 40 hours with 4 "C" alkaline batteries
Dimensions	8.62" x 6.29" x 7.95" (219mm x 160mm x 202mm)
Weight	4.4 lbs (2Kg)
Working Temperature	14°F to 113°F (-10°C to +45°C) (40-6526 & 40-6529) 32°F to 104°F (0°C to +40°C) (40-6544)
Center Screw Thread	5/8" – 11
Rotation Speeds	200 and 500 RPM
Laser Beam Modes	0°, 30°, 60°
IP Protection Class	54

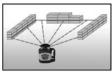
# **10. Application Demonstrations**



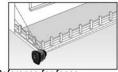
Plumb reference for ceiling installation



Reference for window installation

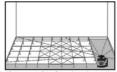


Reference for retaining wall installation



Reference for fence

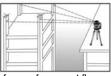




Reference for flooring installation



Reference for squaring and leveling



Reference for cement floor installation



Reference for trim installation and locating ceiling fixtures

### 11. Care and Handling

- This laser unit is a precision tool that must be handled with care.
- Avoid exposing unit to shock vibrations and extreme temperatures.
- Before moving or transporting the unit, make sure that the unit is turned off.
- Remove the batteries when storing the unit for an extended time (more than three months) to avoid damage to the unit should the batteries deteriorate.
- Always store the unit in its case when not in use.
- Avoid getting the unit wet.
- Keep the laser unit dry and clean, especially the laser output window. Remove any moisture or dirt with a soft, dry cloth.
- Do not use harsh chemicals, strong detergents or cleaning solvents to clean the laser unit.

### 12. Product Warranty

Johnson Level & Tool offers a three year limited warranty on each of its products. You can obtain a copy of the limited warranty for a Johnson Level & Tool product by contacting Johnson Level & Tool's Customer Service Department, as provided below, or by visiting our web site at www.johnsonlevel.com. The limited warranty for each product contains various limitations and exclusions.

Do not return this product to the store/retailer or place of purchase. Non-warranty repairs and course calibration must be done by an authorized Johnson® service center or Johnson Level & Tool's limited warranty, if applicable, will be void and there will be NO WARRANTY. Contact one of our service centers for all non-warranty repairs. A list of service centers can be found on our web site at www.johnsonlevel.com or by calling our Customer Service Department. Contact our Customer Service Department for Return Material Authorization (RMA) for warranty repairs (manufacturing defects only). Proof of purchase is required. **NOTE:** The user is responsible for the proper use and care of the product. It is the responsibility of the user to verify the calibration of the instrument before each use.

For further assistance, or if you experience problems with this product that are not addressed in this instruction manual, please contact our Customer Service Dept.

In the U.S., contact Johnson Level & Tool's Customer Service Department at 888-9-LEVELS.

In Canada, contact Johnson Level & Tool's Customer Service Department at 800-346-6682.

### **13. Warranty Registration**

Enclosed with this instruction manual you will find a warranty registration card to be completed for your product. You will need to locate the serial number for your product that is located on the bottom of the unit. PLEASE NOTE THAT IN ADDITION TO ANY OTHER LIMITATIONS OR CONDITIONS OF JOHNSON LEVEL & TOOL'S LIMITED WARRANTY, JOHNSON LEVEL & TOOL MUST HAVE RECEIVED YOUR PROPERLY COMPLETED WARRANTY CARD AND PROOF OF PURCHASE WITHIN 30 DAYS OF YOUR PURCHASE OF THE PRODUCT OR ANY LIMITED WARRANTY THAT MAY APPLY SHALL NOT APPLY AND THERE SHALL BE NO WARRANTY.

## 14. Accessories

Johnson<sup>®</sup> accessories are available for purchase through authorized Johnson<sup>®</sup> dealers. Use of non-Johnson<sup>®</sup> accessories will void any applicable limited warranty and there will be NO WARRANTY. If you need any assistance in locating any accessories, please contact our Customer Service Department.

In the U.S., contact Johnson Level & Tool's Customer Service Department at 888-9-LEVELS.

In Canada, contact Johnson Level & Tool's Customer Service Department at 800-346-6682.