

# JOHNSON<sup>®</sup>

## Self-Leveling Rotary Laser Model No. 40-6519



## Instruction Manual

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

This is a Class IIIa laser tool and is manufactured to comply with CRF 21, parts 1040.10 and 1040.11 as well as international safety rule IEC 285.

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### 1. Kit Contents

<b>Description</b>	<b>Qty.</b>
Self-Leveling Rotary Laser	1
“AA” Alkaline Batteries	6
Wall/Ceiling Mount	1
8' Grade Rod	1
Elevating Tripod	1
Detector with 2 “AA” Alkaline Batteries	1
Tinted Glasses	1
Target	1
Instruction Manual	1
Hard-Shell Carrying Case	1

## 2. Features and Functions

- Self-leveling with magnetically dampened compensation system.
- If laser is out of its self-leveling range, rotation stops and alarm sounds.
- Projects (1) a horizontal laser plane and a vertical plumb beam or (2) a vertical laser plane with a simultaneous 90° split beam.
- Laser rotation speed is 200rpm (Low), 400rpm (Medium), 600rpm (High).
- Illuminated vial for alignment in vertical plane.
- Water and dust 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.

### **DANGER!**

Class IIIa Laser Product  
Max. Power Output:  $\leq 5\text{mW}$   
Wavelength: 625-645nm

**THIS TOOL EMITS LASER RADIATION.  
DO NOT STARE INTO BEAM.  
AVOID DIRECT EYE EXPOSURE.**

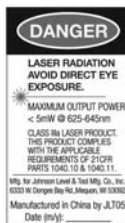


**ATTENTION****IMPORTANT**

- 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® parts and accessories purchased from your Johnson® authorized dealer. Use of non-Johnson® parts and accessories will void warranty.

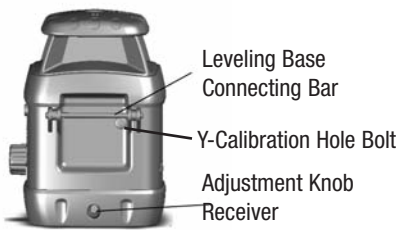
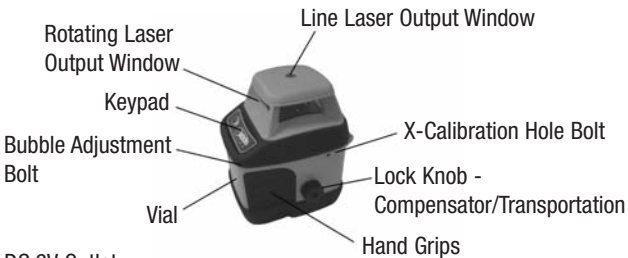


## 4. Location/Content of Warning Labels

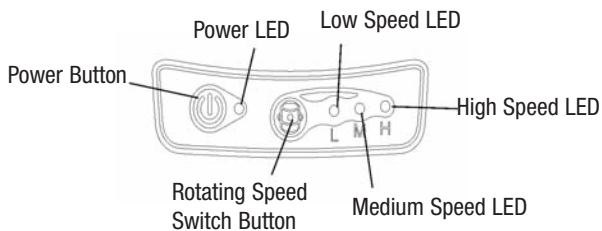




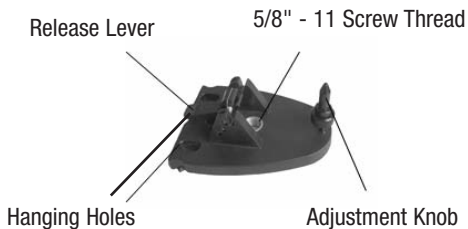
## 5. Location of Part/Components



## Keypad



## Leveling Base



## 6. Operating Instructions

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

### Battery Installation

**Note:** Always check that the compensator lock knob is in the “Off” position before removing and/or replacing batteries.


1. Unscrew the battery cover screw in a clockwise direction to open the battery cover.
2. Insert six “AA” alkaline batteries into the battery compartment according to the polarity illustrated inside.
3. Close the battery cover.
4. Screw in the battery cover screw in a counter-clockwise direction to lock the battery cover.





## 7. Using the Product

### Power On/Off the Laser


Press the  button to power on/off the laser. The rotating speed will be set to high.

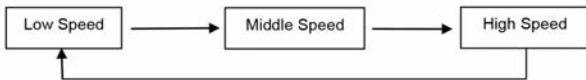
Power LED: Lighted LED indicates power is on.

Extinguished LED indicates power is off.

Flashing LED indicates low batteries – if flashing, please change the batteries.

### Change Rotating Speed

Press the  button to change the rotating speed from high (600 rpm), to medium (400 rpm) and to low (200 rpm). When changing the rotating speed, the corresponding LED will illuminate.



### Notes:


- When starting the unit, the laser will be in high-speed mode.
- Low speed is recommended for indoor use to give the best beam visibility.
- High speed is recommended when used with a detector.



## Manual vs. Self-leveling Operation

1. Turn the lock knob counter-clockwise to the “Off” position to lock the compensator. The laser will be operating in manual mode and will not be self-leveling.
2. Turn the lock knob clockwise to the “On” position to unlock the compensator and allow the laser to self-level.



3. Place the laser on a relatively smooth, flat and level surface.
4. Set the lock knob to the “On” position.
5. Press the  button to power on the laser.
6. Laser must be within  $\pm 3^\circ$  of level for the self-leveling feature to function properly. If the laser is tilted to exceed its self-leveling range, it will stop rotating and will sound an intermittent beeping sound.

## Leveling the Laser for use in Vertical Mode (Bubble Level Adjustment)

1. Turn the lock knob counter-clockwise to the “Off” position to lock the compensator. The laser will be operating in manual mode and will not be self-leveling.



2. While holding the laser by the hand grips, insert the horizontal vial adjustment knob into the adjustment knob receiver.

3. Gently press the leveling base connecting bar receiver into the laser's connecting bar until the clip spring is activated.



4. Place the leveling base with attached laser on a relatively smooth, flat and level surface.



5. Turn the adjustment knob to center the bubble in the vial.



Bubble Centered

### Notes:

- While the laser is in the horizontal status (manual mode), set the lock knob to the “Off” position.
- After operating or before moving the unit, always power off the laser and set the lock knob to the “Off” position. This ensures no damage can happen to the laser assembly during transport.
- If you plan to store the laser for more than 3 months, remove batteries from the laser and detector.

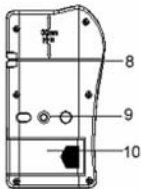
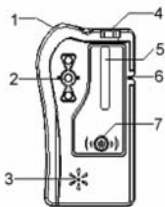
## Detector Usage

### 1. Technical Specifications

Detecting accuracy	$\pm 1.5\text{mm}$ (<50m) $\pm 2.5\text{mm}$ (>50m)
Turn-off timer	6 min $\pm 1\text{min}$
Power	2 "AAA" Batteries
Battery life	45 hours of continuous use
Sound function	Short sound and solid sound
LED indication	Upper red, middle orange, middle green, down red
Size	4.645" x 2.637" x 0.984" (118mm x 67mm x 25mm)
Weight	0.253 lbs. (115g)

### 2. Components

#### (a) Structure



- 1) Holding Cord
- 2) Signal Indicator
- 3) Horn
- 4) Horizontal Vial
- 5) Detecting Window
- 6) Reference Front Marker
- 7) Power Key
- 8) Reference Back Marker
- 9) Connection Port
- 10) Battery Door

### (b) Display



When first turning the detector on, the middle signal indicator turns red first and then turns green. If the horn gives two short sounds and the unit powers off automatically, it means that the battery voltage is low and it is necessary to replace the battery immediately. When turning the power on and the down signal indicator flashes, it means that the battery is low and it is necessary to replace the battery soon.



Power Key: Turn on/off the instrument

## 3. Operation Guide

### (a) Battery Installation

1. Open the battery cover and put the batteries into the battery case according to the polarity shown in the battery slot.
2. Snap the battery cover back.








**Note:** Take the batteries out when the unit is not in use for a long time.



#### 4. Detecting Methods

1. This unit can detect a red rotating laser beam.
2. Press the Power Key once , the middle signal indicator will quickly turn red first and then turns green. It will beep once to indicate that the instrument is ON.

While detecting, the signal indicators show as follows:

The lower red LED is on	The upper red LED is on	The middle LED is orange	The middle LED is green	All LEDs are off
 <p>Laser Line</p> <p>The laser beam is up</p>	 <p>Laser Line</p> <p>The laser beam is down</p>	 <p>Laser Line</p> <p>The laser beam is close to center</p>	 <p>Laser Line</p> <p>The laser beam is exactly to center</p>	 <p>No laser beam is detected</p>
<b>Sound:</b> Single short sound	<b>Sound:</b> Single short sound	<b>Sound:</b> Single short sound	<b>Sound:</b> Solid sound	<b>Sound:</b> No Sound

#### Note:

1. While detecting a horizontal laser beam, it is necessary to have the horizontal bubble vial centered, as the tilt of the detector will influence its receiving accuracy.



2. Keep the detecting window facing the rotating laser.
3. Keep the detector still while detecting the laser beam.



4. When the laser beam is centered, mark at the front reference marker.

5. When the detector does not receive a laser signal for 6 minutes, and there are no buttons pushed during these 6 minutes, the middle signal indicator will turn green first and then turn red. The horn will give two short sounds and the unit will power off automatically.

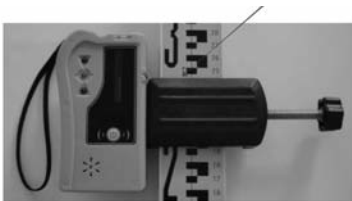


### **5. Accessories Usage**

- Connecting to the grade rod bracket



- Connecting to the grade rod





## **6. Maintenance**

- Keep the detector, particularly the detecting window, clean. If unit becomes dusty, use a clean cloth to gently wipe it clean.
- Avoid knocking the unit over or allowing it to fall on the ground.
- Although the detector is rain resistant, you should avoid submerging the unit in water or other liquids. If unit comes into contact with water or other liquids, wipe it dry immediately.
- Do not use unit around fire or expose it to fire in any way.







## 8. Laser Placement



Use on any near level surface to set a reference



Attach to tripod through 5/8" screw thread in the laser base



Attach to leveling base to use vertically



Attach to tripod through 5/8" screw thread of the leveling base to use vertically





## 9. Application Demonstrations

The 40-6519 can be used for many applications. Some ideas to enhance the utility of your new laser include:

- Installing wood or metal stud walls. Use horizontally to mark reference heights on the stud walls for electrical outlets or other items. Use vertically to set plumb, or to layout the location of the wall's bottom plate.
- Use to lay out tile. The laser can be used both horizontally or vertically to align wall and floor tile in all directions.
- Use the laser vertically to align the ends of shelving, cabinets, or stacked photos.
- Use the laser horizontally to level shelving, level cabinets, or level and align rows of photos.
- Use the laser to align tape for pinstriping or other marking of walls.
- Use the laser outdoors with a detector to grade an area, build retaining walls (horizontal and vertical mode), layout fencing or posts level (horizontal mode) or straight (vertical mode).
- Use to install drop ceilings










## 10. Troubleshooting Guide

Symptom	Possible Cause	Solution
Laser will not turn on	Vertical position: Compensator unlocked	Lock compensator for vertical operation
	Batteries missing or depleted	Change the batteries
	Polarity reversed	Check polarity
Laser turns off after a short time	Batteries depleted	Change or charge the batteries
Laser will not spin	Batteries depleted	Change the batteries
Flashing or Beeping	Laser is beyond leveling range	Place on surface within 3° of level
	Laser is out of calibration	Perform calibration check and calibrate laser if needed
Laser is not accurately reading level	Compensator locked	Unlock compensator to self-level
	Laser is out of calibration LESS THAN 1/2" per 10m	Calibrate laser (procedure in the manual) or return to Johnson dealer for calibration
	Laser is out of calibration MORE THAN 1/2" per 10m	Return to Johnson dealer for service





<b>Symptom</b>	<b>Possible Cause</b>	<b>Solution</b>
Laser will not calibrate	Laser core parts may be misaligned beyond the limit of field calibration	Return to Johnson dealer for service
Laser light appears dim	Batteries are weak Improper battery type  Speed too high (indoor)  Ambient temperature too high/low	Replace batteries  Ensure high quality Alkaline batteries are used  For indoor operation, operate on lowest speed to produce the most visible beam  Ensure temperature is within operating range listed under specifications
Beam is difficult to detect with laser detector	Speed too low	Turn laser onto high speed







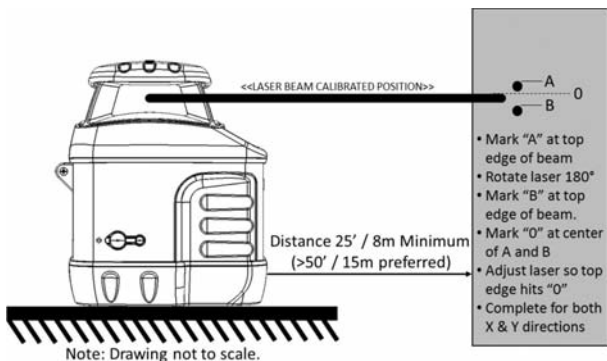
## 11. Calibration

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

### X- and Y-Direction Accuracy Verification

1. Note X- and Y-direction as indicated on the top of the laser.
2. In an indoor setting, place the laser on a level platform at least 25' away from a wall. Position the laser so the X-direction is facing the wall.
3. Press the  button to power on the laser.
4. Set the lock knob to the "On" position to unlock it.
5. Press the  button to change the rotating speed to Low.
6. Mark any point along the top edge of the beam where the beam hits the wall as Point Ax. (Note: This test should be done indoors with dim lighting. It is critical that the laser mark is easily seen.)
7. Rotate the laser 180 degrees.
8. Mark a point where the top edge of the beam hits the wall as Point Bx. This point should be in the same vertical plane as point Ax (directly above, below, or on top of point Ax).
9. Mark the center point between points A and Bx as Point Ox.
10. If the distance between point Ax and Point Bx is more than 3/16" at 25', the laser is out of calibration. Calibrate the laser by following the steps in the Accuracy Calibration section below. If this distance is < 1/16" at 25', proceed to step 11 to check the Y-direction accuracy.





11. Position the laser so the Y-direction is facing the wall.
12. Perform Y-direction self-check using the same method as the X-direction (steps 6-10 above) and mark Point Ay, By, and Oy.
13. If the distance between points Ay and By is more than 3/16" at 25', the laser is out of calibration. Calibrate the laser by following the steps in the Accuracy Calibration section below. If this distance is < 3/16" at 25', and your X-axis is also within the tolerance listed in Step 10, then your laser is in calibration.

### Accuracy Calibration

1. **Note:** The laser should be turned off and the compensator must be unlocked prior to making any adjustments
2. Remove the adjustment-hole bolts with a #1 Philips screwdriver, and adjust the X direction fine-adjustment bolt in the instrument core with a 3mm hex wrench until the top edge of



the laser line is within  $\frac{3}{32}$ " of Point 0. Loosening this screw will bring the laser line UP as viewed when the X-axis is pointed towards the wall. Tightening the adjustment bolt will bring the laser line DOWN in this orientation.

3. After adjusting the X-direction, adjust the Y-direction using the same method. Loosening the Y direction adjustment bolt will bring the laser line UP the wall in the direction of the Y-axis, tightening will bring the laser line DOWN the wall.
4. After the laser is calibrated, reinstall the adjustment-hole bolts and complete the steps above for X & Y direction accuracy verification to confirm the changes you have made.



Remove the adjustment-hole bolt



Adjust the fine adjustment bolt

### Accuracy Self-Check for Plumb Beam

1. After completing the above steps to field adjust the rotary laser output, double check the plumb beam output. Because the optics for the plumb beam are shared with the optics for the rotary, if the rotary is in calibration, the plumb beam should also be in calibration, so this step is really a redundant check; no further adjustment to the plumb beam is possible.
2. Place the instrument horizontally on a rotating tripod head so that the plumb beam strikes the ceiling. The higher the ceiling,







- the more accurate the check will be. We recommend a minimum height of 10'; 25' is preferred.
3. Mark the point on the ceiling where the plumb beam hits.
  4. Rotate the laser 90 degrees and again mark the spot where the plumb beam hits.
  5. Repeat step 4 twice, resulting in a total of 4 marks on the ceiling.
  6. The four points should form a circle. Measure its diameter. If this diameter is less than 3/16" at 25', the laser is in calibration. If the plumb beam is out of calibration, and the rotary beam is within calibration, the laser must be serviced by an authorized Johnson dealer. No further user adjustments are possible. If both rotary and plumb beams are out of calibration, follow the steps above for Accuracy Calibration.



### **Vial Calibration**

1. Adjust the laser so that it projects a perfectly vertical beam on the wall. Mark two points on the wall and use a known calibrated bubble level to validate that beam is vertical. If the vial on the laser reads level, no further adjustments are needed.
2. If the vial needs adjustment, use a screwdriver to remove the vial level adjustment bolt cover.
3. Insert a 2.5mm hex wrench into the adjustment hole to adjust the screw.





4. Rotate the hex wrench to center the bubble. Tightening (clockwise rotation) will move the bubble AWAY from the adjustment screw. Loosening will move the bubble TOWARDS the adjustment screw.
5. After the vial is calibrated, reinstall the vial adjustment bolt cover.



Remove vial adjustment  
bolt cover



Calibrate the vial using  
2.5mm hex wrench





## 12. Technical Specifications

Laser Wavelength	635nm $\pm$ 10nm
Laser Classification	Class IIIa
Maximum Power Output	$\leq$ 5mW
Accuracy	$\pm$ 3/16"/50 ft. (3mm/10m)
Interior Range	Up to 200 ft (60m) diameter depending on light conditions
Exterior Range	Up to 800 ft (240m) diameter with detector (included)
Self-Leveling Range	$\pm$ 3°
Power Supply	6 "AA" alkaline batteries (included)
Battery Life	Approx. 25 hours continuous use
Dimensions	5.7" x 4.2" x 6.2"
Weight	2.9 lbs. (laser only); 3.1 lbs. (laser and leveling base)
Working Temperature	14°F to 113°F (-10°C to +45°C)
Tripod Thread	5/8" – 11
Rotation Speeds	200 rpm, 400 rpm, 600 rpm
IP Protection Class	54





## 13. 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.

## 14. 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](http://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](http://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.

## 15. Warranty Registration

Please register within 30 days of purchase. Registering ensures we have your information on file for warranty service even if you lose your receipt, and lets us contact you if there is ever a product recall. We will never sell your information and only send you marketing information if you opt-in.

To register, go to [www.johnsonlevel.com/register](http://www.johnsonlevel.com/register).





## 16. Accessories

Johnson® accessories are available for purchase through authorized Johnson® dealers. Use of non-Johnson® 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.

