



## **Pipe Laser**

### ***Model No. 40-6690***



# **Instruction Manual**

*Congratulations on your choice of this Pipe Laser. We suggest you read this instruction manual thoroughly before using the pipe laser. Save this instruction manual for future use.*

The 40-6690 pipe laser is an easy-to-use laser that provides underground contractors line, elevation, and grade control for installing storm, sanitary, or other gravity-flow drainage pipe. This system can also be used for tunneling, boring, pipe alignment, or any other application requiring line, elevation, and grade control.

The pipe laser emits a highly visible red beam of laser light in a direction at a predetermined (grade) for the alignment of gravity-flow pipe. The laser light is intercepted at the opposite end of the pipe by the pipe laser target. To align the pipe, position it so that the pipe laser's beam is centered in the target.

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

# Table of Contents

1. Kit Contents	7. Using the Product
2. Features and Functions	8. Self-Check & Fine Calibration
3. Safety Instructions	9. Technical Specifications
4. Location/Content of Warning Labels	10. Care and Handling
5. Location of Parts/Components	11. Product Warranty
6. Operating Instructions	12. Warranty Registration
	13. Accessories

## 1. Kit Contents

<b><u>Description for Model 40-6690</u></b>	<b><u>Qty.</u></b>
Pipe Laser	1
Rechargeable Battery pack	1
Alkaline Battery Pack (batteries not included)	1
6.4V Charger Adapter	1
12V Car Charger	1
Targets	2
Leg Sets	5
3rd Leg	1
Remote Control with 9V Battery	1
Instruction Manual with Warranty Card	1
Hard-Shell Carrying Case	1

## 2. Features and Functions

- Electric self-leveling
- Out of level indicator, laser beam will blink and LCD symbol will indicate out of level position
- Large grade range
- Quickly reset the line to the center position
- Stand by mode to conserve battery
- Operates with remote control
- Various leg sets and targets for different size pipe
- Waterproof

### 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



**DANGER**

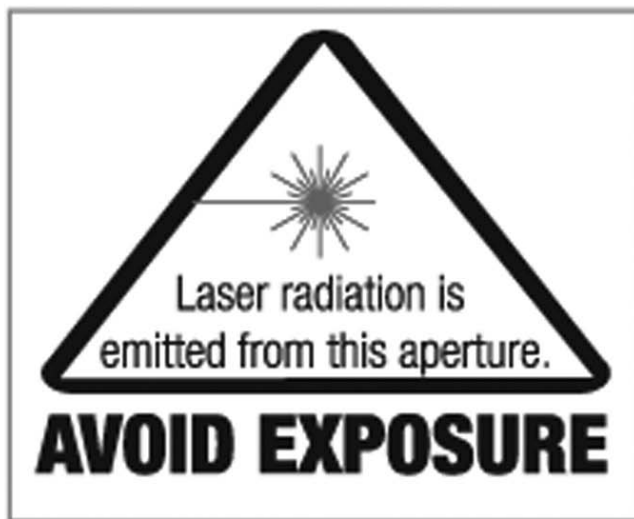
**LASER RADIATION  
AVOID DIRECT EYE  
EXPOSURE.**

 **MAXIMUM OUTPUT POWER  
< 5mW @ 625-645nm**

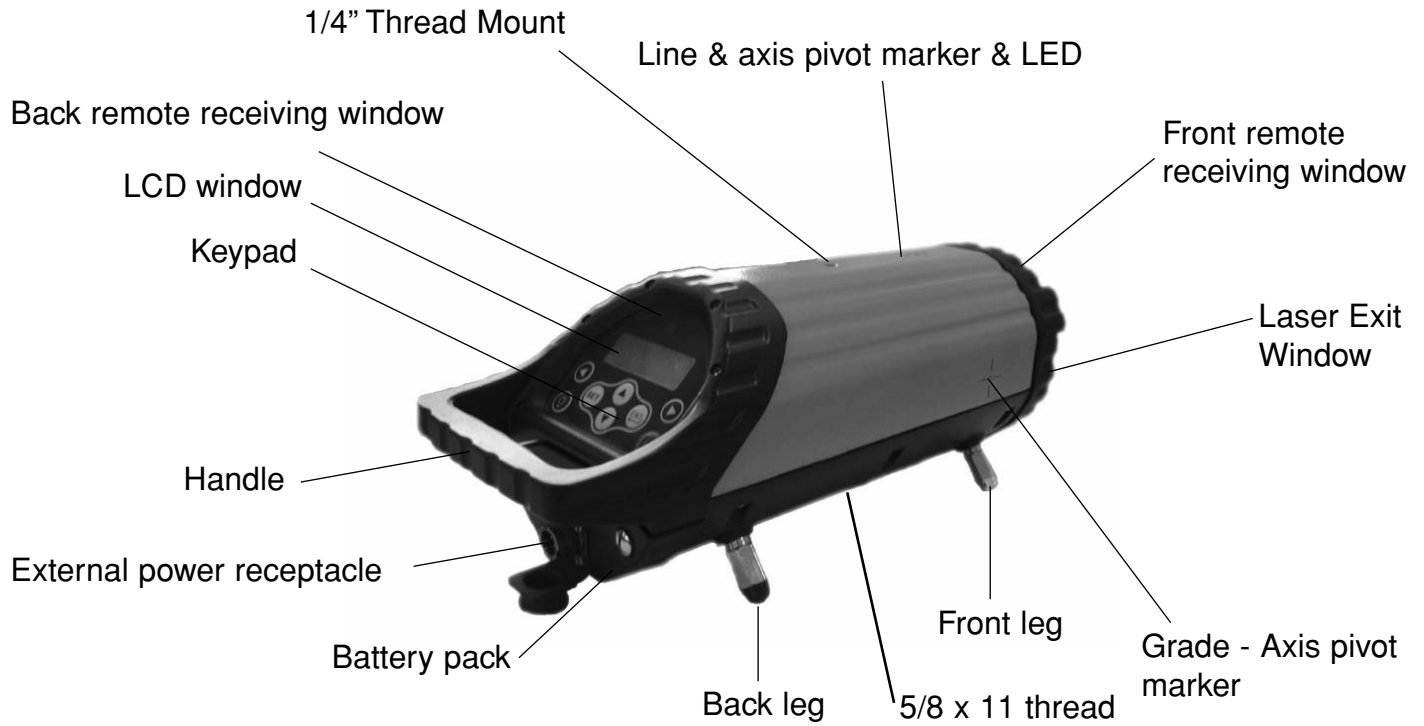
**CLASS IIIa LASER PRODUCT.  
THIS PRODUCT COMPLIES  
WITH THE APPLICABLE  
REQUIREMENTS OF 21CFR  
PARTS 1040.10 & 1040.11.**

Mfg. for Johnson Level & Tool Mfg. Co., Inc.  
6333 W. Donges Bay Rd., Mequon, WI 53092

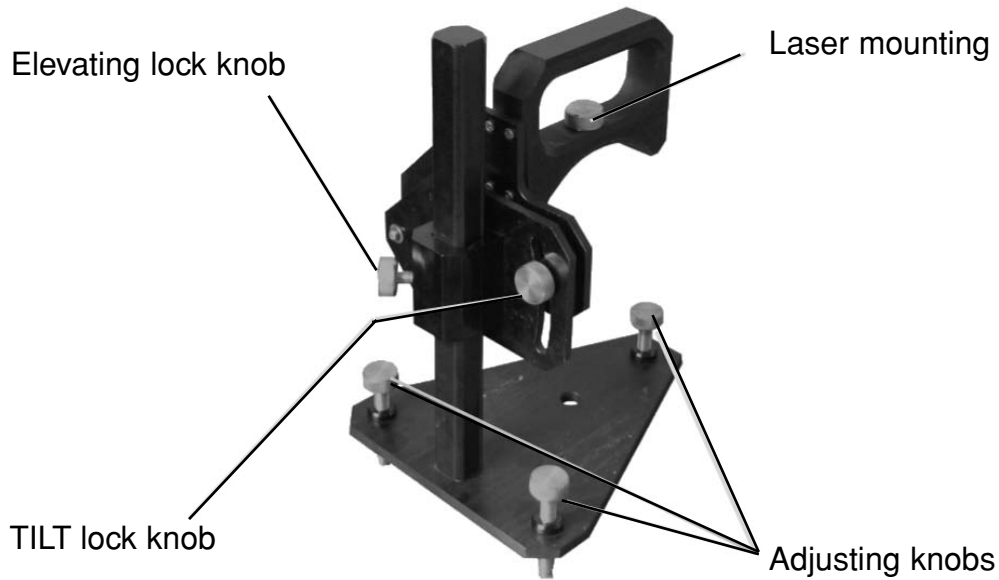
Manufactured in China by JLT05  
Date (m/y): \_\_\_\_\_



# 5. Location of Part/Components



Optional Adjustable Trivet Stand 40-6391



Accessories Included



Small and large targets



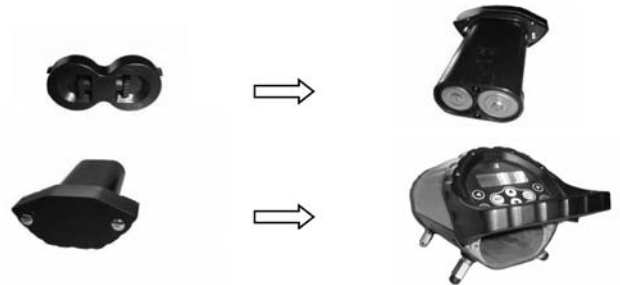
Various leg sets

## 6. Operating Instructions

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

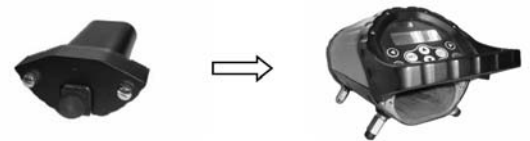
### Battery installation

a) Put 4 “D” alkaline batteries into the battery pack following the polarity direction indication. Put the alkaline battery pack cover back, and install the battery pack into the laser.



Alkaline battery box installation

b) Install the rechargeable battery pack into the laser.



Rechargeable battery box installation

### Recharging the battery pack

Plug the adapter into the charging port on the rechargeable battery. The adapter box charging LED is red during the charging process, and it will turn to green when the battery is fully charged.



Charging LED on adapter box



Charging the battery pack outside the laser



Charging the battery pack with rechargeable battery pack in laser

### Additional External Power Cables included

1) 12V adapter 2) Car adapter

**Note:** Recharge the battery when the battery indication shows low or no power.

### **Using the Optional 40-6391 Adjustable Trivet Stand:**

1. When a laser is to be set on a flat surface where the laser beam is not centered in the pipe, use model 40-6391 Trivet Stand.
2. Using this system, the elevation of the laser beam can be set by either measuring down from a grade offset hub outside the trench or up from the floor of the manhole to the beam.

The pipe laser can be fixed to the 40-6391 adjustable trivet stand as indicated by the picture below. Loosen the elevating lock knob to adjust the height, loosen the TILT lock knob to adjust the TILT angle.

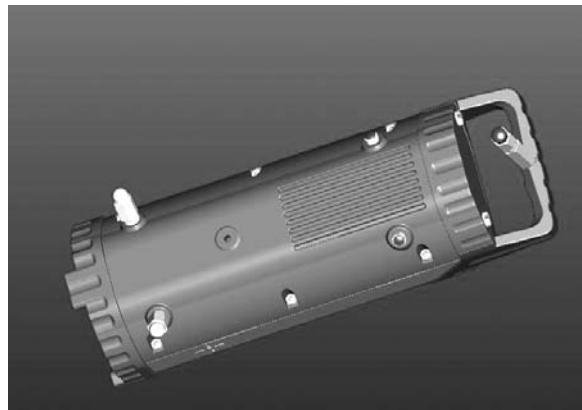


### **Laser Placement with leg sets:**

Choose the different size leg sets for different size pipe. (6" or 150mm (no legs), 8" or 200mm, 10" or 250mm, 12" or 300mm, 15" or 400mm, 21" or 500mm).

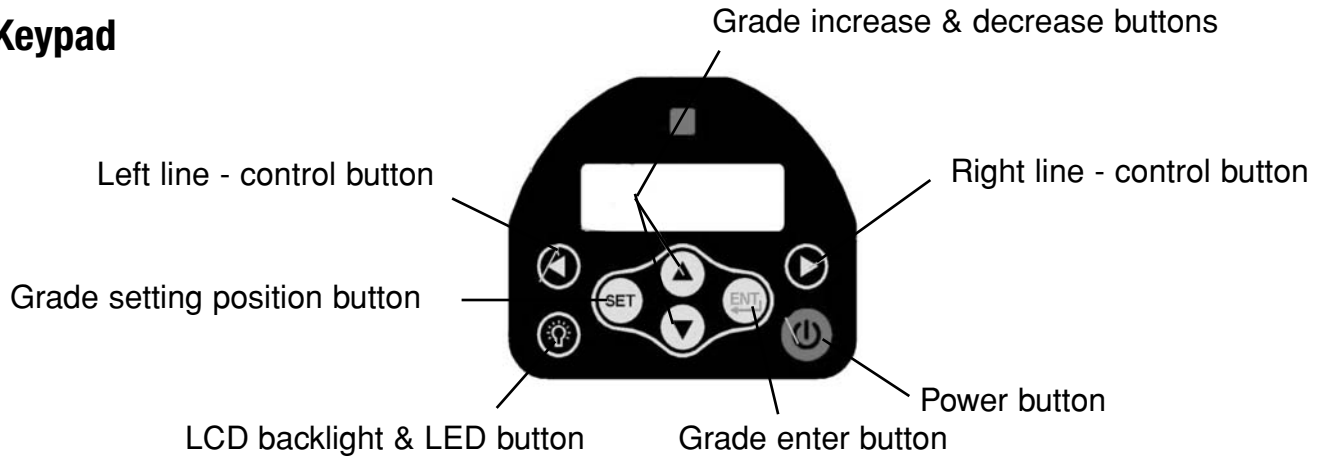
### **For 3 feet support of the pipe laser:**

Screw the silver adapter to the hole under the handle of the pipe laser. Attach one leg to the adapter and two legs to the front of the pipe laser as shown in picture.

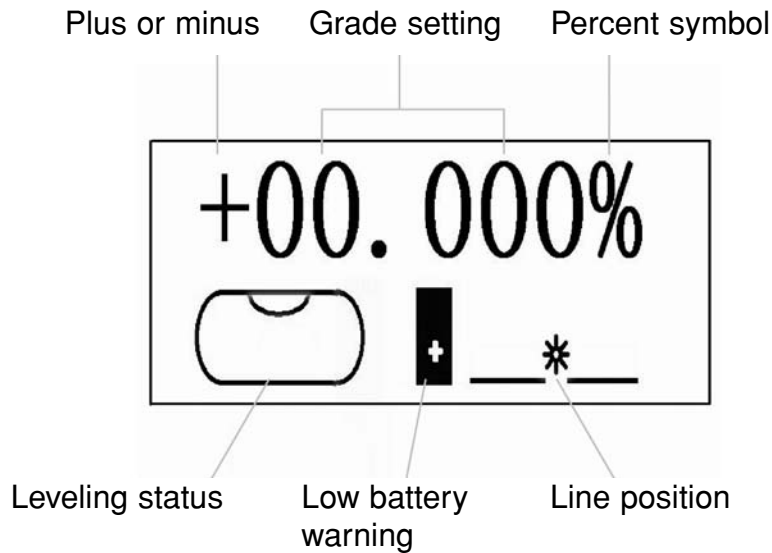


# 7. Using the Product

## Keypad




## Liquid Crystal Display (LCD)




## Keypad Operating Instructions

### Power button

Press the power button  to turn on and off the laser. The laser will electronically self level and display the last grade entered.

### LCD backlight and LED button

Power on the laser and press the LCD/LED button . The top green LED will turn on. The line-axis pivot marker and LED identifies the pivot point for the pipe lasers line system. The LED also allows you to align a transit over the top of the pipe laser.



## Left and Right line control buttons

With the laser powered on, press the left line control button to move the laser beam to the left and press the right line control button to move the laser beam to the right. The speed of the line movement increases as the line control button is held.

When the laser dot is moving, the LCD display will show the relevant laser dot position.

A \*---- symbol flashing means the laser dot is as far left as it can go.



A -\*--- symbol means the laser dot is on the left

A --\*-- symbol means the laser dot is centered

A ---\*- symbol means the laser dot is on the right

A ----\* symbol flashing means the laser dot is as far to the right as it can go.

## Center position

After the laser is turned on, pressing the left and right control buttons   simultaneously for one second, will reset the laser line to the center position.

- When the dot is moving to the center position, the LCD will display the following symbol.  $\rightarrow * \leftarrow$
- When the laser dot is centered, the LCD will display the following symbol.  $-- * --$

## Grade setting position button

Turn the laser on by pressing the power button. The laser will move to the last entered grade. Press the set button and the (+) or (-) symbol on the LCD will blink. Pressing the set button again will make the first digit blink. Each additional press of the set button will make the next digit to the right blink. When the last digit is blinking and the set button is pressed again, the (+) or (-) symbol will blink.

## Grade increase or decrease buttons

In the grade setting mode, with the desired digit blinking, change the grade value by pressing these buttons. Press the up button to increase the value of the digit. Press the down button to decrease the value of the digit. Holding the button in will change the value quickly.

Holding the   together will set the grade value to “0”.

## Grade enter button



After the desired grade has been entered on the LCD, press the grade enter button. The laser beam will move to the new grade value. When the laser is self-leveling, the grade value symbol will flash and will stop flashing when the laser is level.

## Out of level alarm (Front and back)


If the laser is placed beyond its self-leveling range, the laser beam will blink and the LCD symbol will blink. The laser will need to be repositioned within its self-leveling range as noted below.

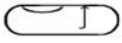
When LCD shows:   \* user needs to lower the handle side.


When LCD shows:   \* user needs to raise the handle side.

## Out of level (right and left)


The LCD has a bubble symbol which is used to indicate the right or left out of level status. If the laser is out of level to the right or left, it will effect its accuracy. Place the laser so the bubble symbol is centered.

 If the LCD symbol flashes, it means the left side of laser is beyond the allowed range and the left side needs to be lowered.

 If the LCD symbol does not flash, it means the left side of laser is high but still in the allowed range.

 This symbol means the laser is level and is in its idea accuracy and working status.

 If the LCD symbol does not flash, it means the ride side of laser is high but still in the allowed range.

 If the LCD symbol flashes, it means the right side of laser is beyond the allowed range and the right side needs to be lowered.

## Battery symbol

With the laser powered on, check the battery capacity symbol to note the power status on the LCD display.



Full battery, no need to charge




Low battery, laser can be used



No power, battery pack needs to be recharged or new alkaline batteries must be installed

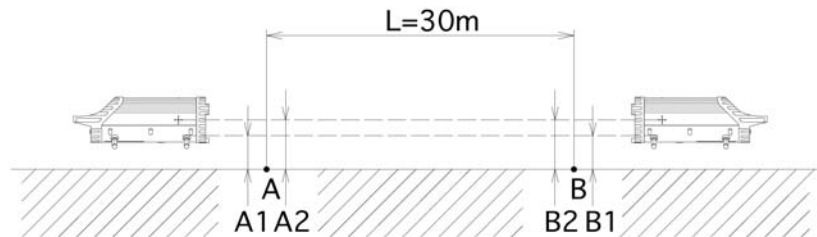
## Remote function

Included with the pipe laser is a remote control. The keypad function of the remote control is the same as the pipe laser, except the power button .

- Press the power button on the remote when pipe laser is turned on and the pipe laser will enter the sleep mode. The pipe laser saves the current data and powers down.
- The laser beam will be off in the sleep mode and the top LED will flash slowly. Press the power button on the remote again and it will power up the laser. If the laser is in the sleep mode for more than 30 minutes, it will power off automatically.
- Remote range: front (laser output window end) 165' or 50m, back (handle end) 35' or 10m.

## 8. Self-Check & Fine Calibration

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



- Find a road, parking lot, or level plane (slope should be less than 4" at 100'/30m).
- Pick 2 points (A and B) whose distance is about 100' or 30m between each other. The distance does not need to be measured exactly, mark the 2 points.
- Put the pipe laser behind point A, turn it on, and let it warm-up for 10 minutes.
- Set the grade to be 00.000%.
- Point the laser beam to go through points A and B, make sure the laser is in its self-leveling range.
- Accurately measure the height from the center of the laser beam point A and point B, note it as A1 and B1.
- Put the laser behind point B and let the laser beam go through points A and B making sure the laser is in its self-leveling range.
- Accurately measure height from the center of the laser beam to point A and point B, note it as A2 and B2.
- Calculate  $A2-A1$ ,  $B2-B1$ . If  $|(A2-A1) - (B2-B1)|$  is less than or equal to .118" or 3mm, the accuracy is good;
  - If the value of  $A2-A1$  is larger than the value of  $B2-B1$ , the laser beam is too high, and the user needs to adjust the laser line to be leveled.
  - If the value of  $A2-A1$  is smaller than the value of  $B2-B1$ , the laser beam is too low, and the user needs to adjust the laser line to be leveled.

## Accuracy Calibration

- Set the grade at +0.01 - +0.02%.
- Turn off the unit.
- Press and hold “left arrow” and “right arrow” keys.
- Press and release “power on/off” key when holding the “left arrow” and “right arrow” keys.
- Hold the “left arrow” and “right arrow” keys until “mem clear” shows on the screen.
- Recalibrate the laser until  $|A2-A1) - (B2-B1)|$  is equal or less than 3mm.
- When  $|A2-A1)-(B2-B1)|$  is greater than 6mm, you need to contact a Johnson® authorized repair center.

## 9. Technical Specifications

Laser Wavelength	635nm±10
Laser Classification	Class IIIa
Maximum Power Output	≤5mW
Grade Range	-20% to +40%
Grade Display	00.001%
Accuracy	±1/16” at 100’ (±5mm at 100m; ±10 arc sec)
Self-Leveling Range	± 5°
Left and Right Scan	± 4°
Power Supply	4 “D” alkaline batteries, rechargeable Ni-MH battery pack, 12V adapter, car adapter
Battery Life	Ni-MH: Approximately 64 hours continuous use Alkaline: Approximately 40 hours continuous use
Dimensions	5.19” x 14.96” (132 x 380mm)
Weight	13.2 lbs. (6 Kg)
Working Temperature	-4°F to 122°F (-20°C to +50°C)
IP Protection Class	68 nitrogen purged

## 10. 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.
- 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.

## 11. 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.

## 12. 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 side 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.**

## 13. 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.

