10. CHECK AND ADJUSTMENTS

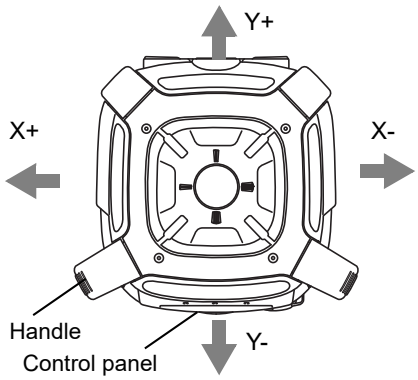
Please perform check and adjusting regularly. First check, and then make adjustments accordingly.

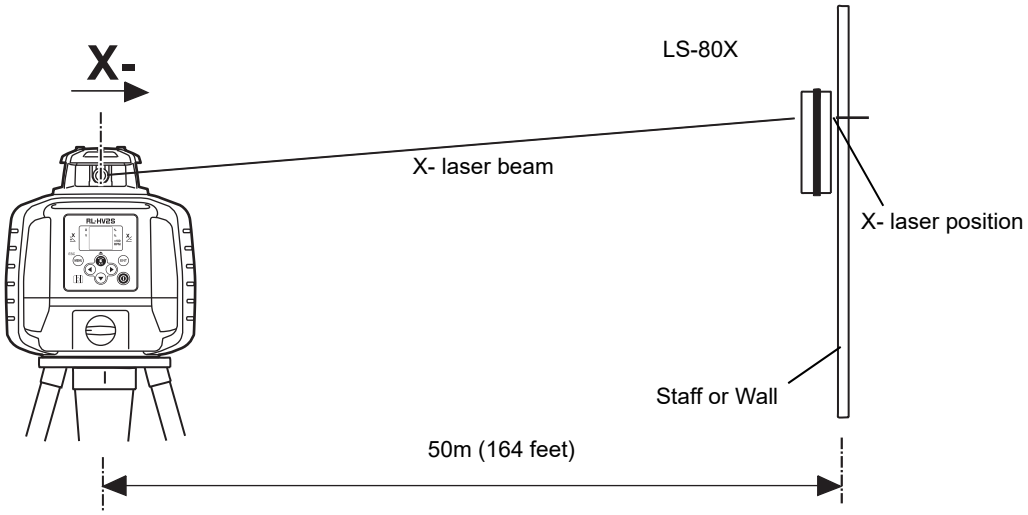
10.1 Check and Adjust Horizontal Rotation

■ Horizontal Rotation Grade Error

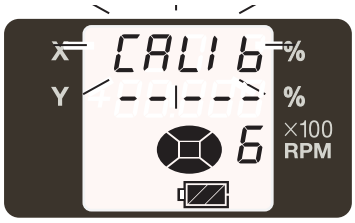
PROCEDURE Checking

1. Set up tripod approximately 50 meters away from a wall, and set the instrument on level with the X- facing the wall.



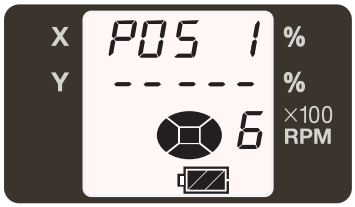


2. While pressing the XY key, turn on the power. (Only the RL-HV is operable).
   [CaLIb] will blink on the X axis screen. *1)



3. Press the ENT key.

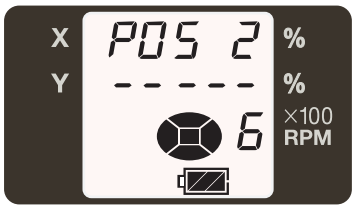
   The screen will be in the X-axis check and adjusting mode.
   Self-leveling on the RL-HV is complete and the laser will emit.



4. Turn the LS-80X to the high precision mode.

5. Detect the center of the laser beam on the wall with the LS-80X and mark it. (X1)

6. Press the (ENT) key.

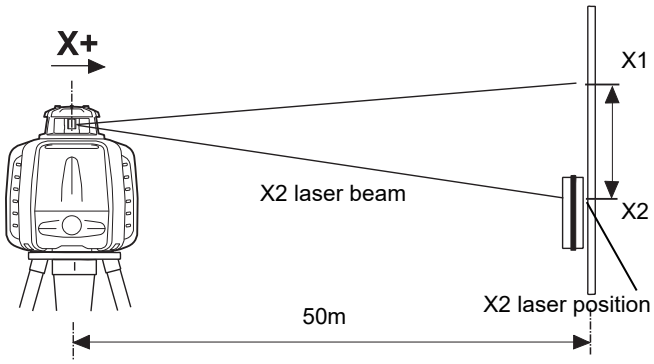


7. Loosen the centering screw and rotate the RL-HV 180°, and tighten the screw to secure. The RL-HV X+ surface will face the wall. When rotating the RL-HV, ensure that the instrument height is not misaligned.

   The RL-HV self-leveling is complete and the laser will emit.

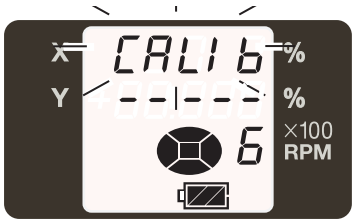
8. Detect the center of the LS-80X laser beam on the wall and mark (X2).

   If the difference in height of the two laser beam marks (X1 and X2) is less than 5 mm, no adjustment is required. Turn off the power. If the difference is more than 5 mm, follow adjusting steps for horizontal rotation.
   ☞ " PROCEDURE Adjusting"

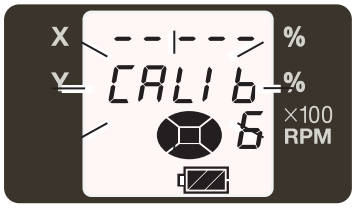


9. Perform check on the Y axis after the adjustment for the X axis is complete.

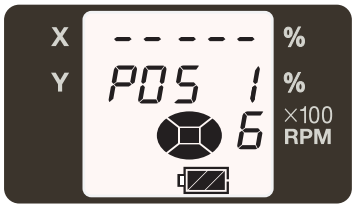
   When checking and adjusting the Y axis direction, press the (▼) key.



   Press the (ENT) key.



   The screen will switch to the Y axis check and adjusting mode.



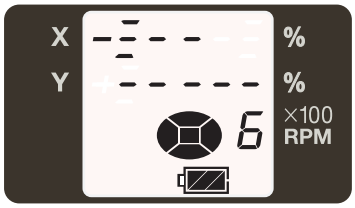
• A difference between X1 and X2 is more than 40 mm (±90"), it is outside of the adjustment range. Contact your local dealer.

PROCEDURE Adjusting

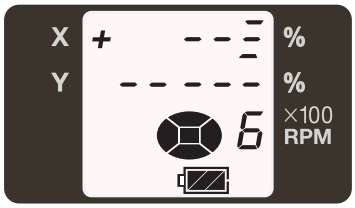
1. According to step 8 of the horizontal rotation check, press the ◀ ▶ keys* to move the laser beam between X1 and X2.

   When adjusting the Y axis direction, press the XY ▼ keys.

   ☞ *Display during arrow key operation

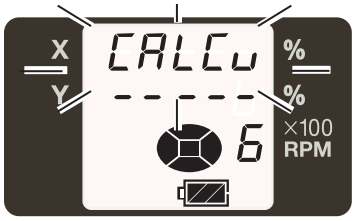


OR

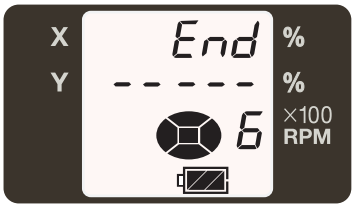


2. Press the ENT key.

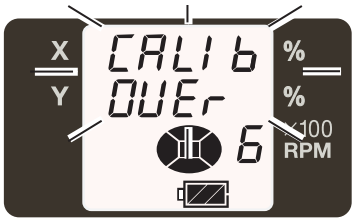
   RL-HV is calculating the correction value. Do not touch the RL-HV until [End] is displayed. (If you touch it, you will need to readjust.)



   • Adjustment for X axis is complete.
   Turn off the power.

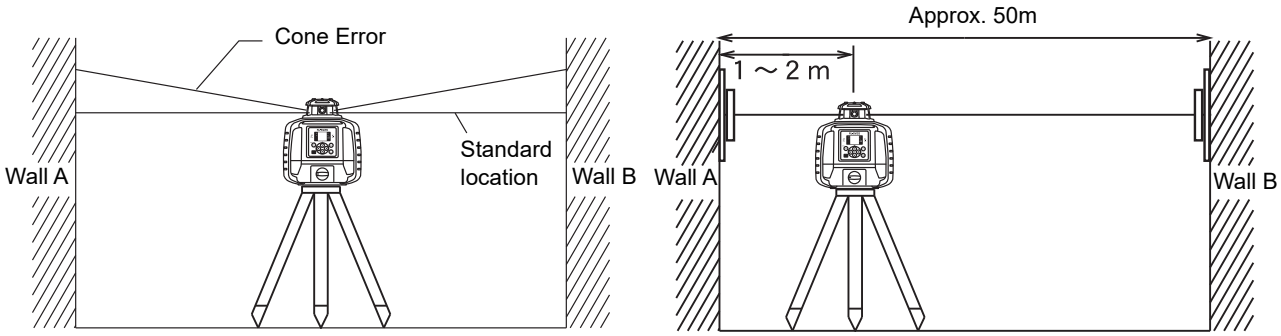


   • Exceeding the range of adjustment.
   ☞"9. ERROR DISPLAYS"



■ Horizontal Rotation Cone Error

• Perform the following check after completing the check for "■ Horizontal Rotation Grade Error".



1. Set up the laser centered between two walls approximately 50 m (164 ft) apart. Orient the instrument so one axis, either X or Y, is facing the walls. Grade should be set to 0% in both axes.

2. Locate and mark the position of the RL-HV beam on both walls using the LS-80X.

3. Turn off the RL-HV and move the RL-HV closer to wall A (1 m to 2 m /3 ft to 6 ft).
   Do not change the axis orientation of the RL-HV. Turn the RL-HV on.

4. Again locate and mark the position of the RL-HV beam on both walls using the LS-80X.

5. Measure the distance between the first and second marks on each wall.

   If the difference between each set of marks is less than ±5 mm (±7/32 of an inch), no error exists.

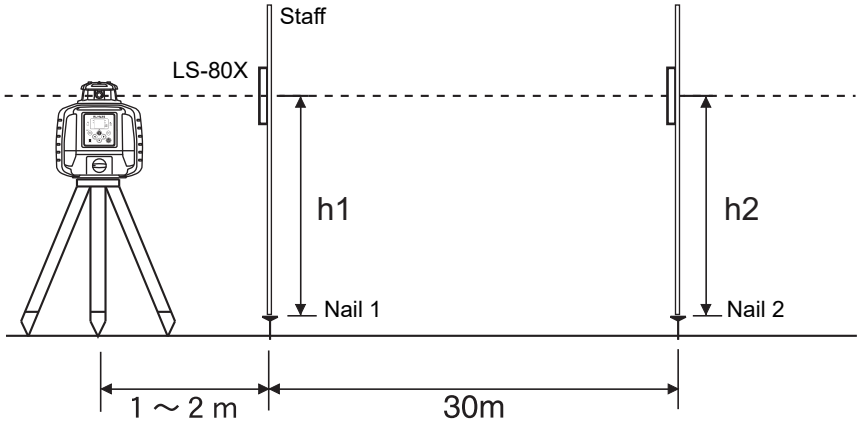
• If the difference between [wall A]-side and [wall B]-side exceeds ±5 mm (±7/32 of an inch), contact your local dealer.

■ Grade Setting Error

- Perform the following check only after completing "■ Horizontal Rotation Grade Error" and "■ Horizontal Rotation Cone Error".

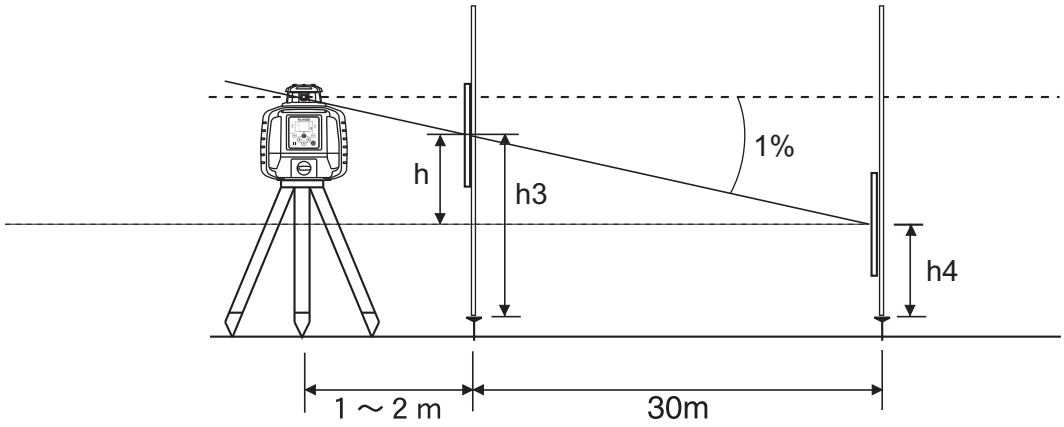
PROCEDURE Checking

1. Setup the X- side facing the staff as shown in the figure.
   Securely position Nail 1 and Nail 2 exactly 30m apart.



2. Turn on power for the RL-HV and verify the staff height of Nail 1 and Nail 2 at grade setting of 0% with LS-80X and record.
   At this time the staff height for Nail 1 and Nail 2 should recorded as h1 and h2 (mm). Check the LS-80X is set at high7 precision.

3. Set X axis grade to +1.000%.
   Align read the elevation of the laser beam in millimeters at Nail 1 and Nail 2. Designate these elevations as “h3” at Nail 1, and “h4” at Nail 2.



4. Using the elevation readings for h1, h2, h3 and h4, complete the equation below.

$$X(\%) = \frac{h}{30000(mm)} \times 100 = \frac{(h2-h4)-(h1-h3)}{30000} \times 100$$

If the calculated result is the range of 0.990% - 1.010%, the instrument is normal.
If the calculated result for either axis is out of the range, contact your local dealer.
Repeat the procedure aligning the “Y” axis on the line created by Nail 1 and Nail 2.

10.2 Vertical Calibration

■ Checking Calibration

1. Turn on the power for the LS-80X and move into high precision mode.

2. Install the LS-80X on a beam 10 meters or higher above the floor, as shown in the diagram.

3. Hang the plumb bob from the LS-80X indicator to the floor (Point A).

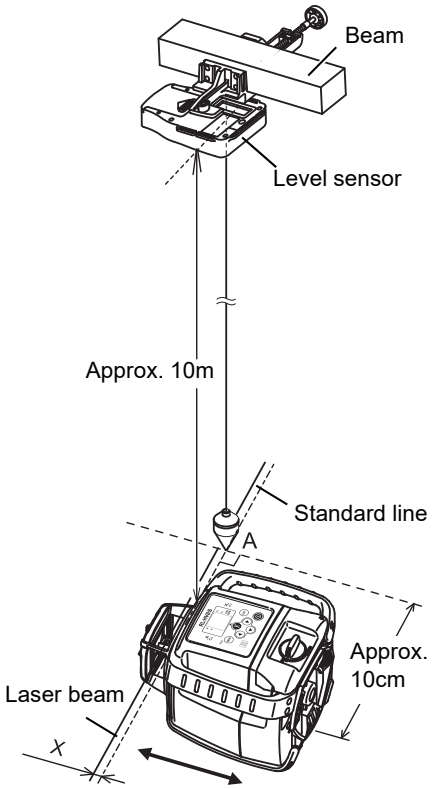
4. Mark the standard line on the floor perpendicular to the direction of the beam where Point A crosses.

5. Set up the RL-HV for vertical rotation at the position shown in the diagram and turn on the power.

6. Maintain the level of the standard line on the floor and laser beam, and move the RL-HV to the direction of the arrow.
   Ensure that the laser beam is at the LS-80X indicator position (check with the buzzer sound from the LS-80X).

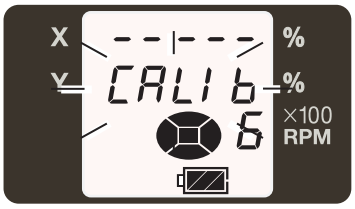
7. Measure the difference X between the standard line and laser beam.

   If X is within 1 mm, no adjustment is required. If the difference exceeds 1 mm, move on to the next adjustment.

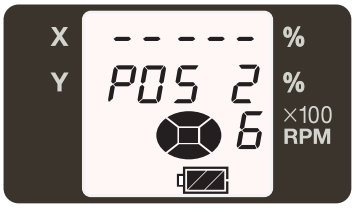


■ Vertical calibration and adjustment

1. While pressing the XY key, press the ⏻ key.



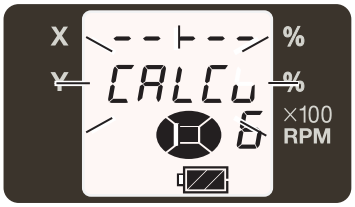
2. Press the ENT key.
   Move the RL-HV in the direction of the arrow to align the standard line and laser beam.



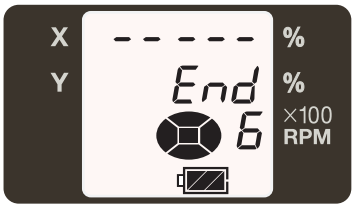
3. Press either the XY key or the ▼ key to align the laser beam with the LS-80X indicator position. (check with the buzzer sound from the LS-80X)

4. Press the (ENT) key.

   The RL-HV is calculating the correction value.
   Do not touch the RL-HV until [End] is displayed. (If you touch it, you will need to readjust.)



   When the screen on the right is displayed, the adjustment is complete. Turn off the power.



Note

• If [CALIb OVEr] is displayed: ☞ "9. ERROR DISPLAYS"