AGATEC

GAT 220
OPERATION MANUAL

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1 General information

Congratulations on purchasing your **GAT220**. We hope that this versatile and user-friendly laser will assist you for many years to come.

Although it is easy to use, we recommend that you read this manual to ensure that you enjoy hassle free operation and get the best out of your laser.

GAT220 Laser Overview

High Impact Strength ABS Housing

1. Mounting base with 5/8 x 11 thread. Suitable for use with domed or flat head tripods.
2. Keypad. See 1-4 for details.
3. Rotating laser head.
4. Removable metal head guard.

1-1 Description

The **GAT220** is an automatic levelling, visible laser that can be used for horizontal levelling.

Advanced features include:

- User-friendly interface
- Automatic self-levelling in horizontal mode
- Easy Electronic calibration
- Weight only 1.5kg
- Useable with alkaline or rechargeable batteries
- Removable metal head guard.
- High Impact Strength ABS Housing

1-2 Potential Operational Hazards

The **GAT220** is a Class 3a/3r visible laser and is manufactured to comply with the International Rules of Safety standard IEC285.

Although the power of the emission of the beam does not exceed 5mW in Class 3a/3r, the following precautions are recommended:

- DO NOT stare directly at the beam

- DO NOT set up the laser at eye level
- If necessary warn surrounding workers or passers by of the laser
- Wear protective eye glasses

1-3 Technical Specifications

Recommended Range	300 m diameter
Accuracy	2.4mm at 30m
Levelling Accuracy	0.008% +/- 2.4 mm at 30 m.
Levelling Range	+/- 7%
Rotation speed	0-60-150-300-450-600 rpm
Visible Laser Diode	635 nm < 2mW (Class 3a/3r)
Power Supply	2 D Size alkaline batteries or rechargeable batteries
Charging time	15 hours
Battery life	40 hours with optional rechargeable batteries. 160 hours with alkaline batteries
Weight	1.5 Kg
Size	19.5 x 21 x 14 cm
Environmental	Weather resistant (rain and dust – IP64)

1-4 GAT220 Keypad Overview
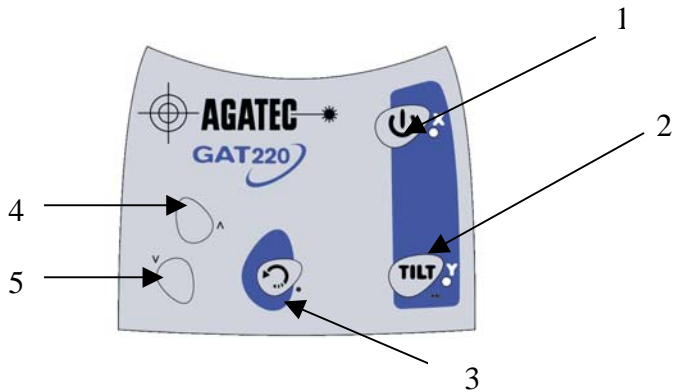
1. On / Off / *X axis calibration indicator* /
   Low battery
2. Tilt / H.I Alert / *Y axis calibration
   indicator* / *Change calibration axis*
3. Increase speed control */ Save calibration
   data* / *Enter calibration mode.*
4. *Move beam up*
5. *Move beam down*

*Italics correspond to indicate the keys used in
   CALIBRATION MODE ONLY.*

2 How to use your GAT220 Laser

See 1-4 for a keypad overview.

When first turned on the laser will conduct a self-test. The beam will then blink while the laser is self-levelling. Once it has levelled the head will start to rotate.

2-1 Tilt Key

Tilt: H.I Alert mode. The Tilt function is also known as the H.I (height of the instrument) Alert. This feature stops the laser automatically and sounds an alarm if the laser is jarred or moved, preventing inaccurate readings.

To activate this function push the Tilt key (2) after turning the instrument on. The H.I Alert feature is available 30 seconds after the instrument has self-levelled.

The red light indicator near the Tilt key will blink when operating in this mode. The LED will blink fast when the laser is still self-levelling. The LED will blink slowly when the laser is levelled and when the Tilt function is on.

If the laser is disturbed, the head will stop rotating and the red light will be on continuously. If this occurs turn the laser off, wait 5 seconds, and turn it on again after checking that the beam is still at its original reference.

2-2 Horizontal set-up

1. The **GAT220** laser can be used directly on the ground or on a standard 5/8x11 threaded tripod.
2. Press the On/Off key on the laser keypad to switch the laser on. It will start its automatic levelling.
3. To select the H.I Alert [(Tilt), press on the 'Tilt' button (2)]. Remember that the Tilt function will be active 30 seconds after the **GAT220** has finished its self-levelling.
4. To increase the rotation speed of the head, press on (3). Five different rotations speeds are available. You can choose the most appropriate speed for the ambient light conditions which you re working in.
5. To turn the laser off, press on On/Off key (1).

NOTE: It is very important to take care around the set-up area and to check that your laser has not been moved. This will help to ensure that your settings and readings are accurate.

2-3 Rotation Speeds

Your **GAT220** is equipped with a visible laser diode. It may be necessary to adjust the rotation speed according to the ambient light conditions. To do this press key (3) on the laser keypad to adjust to the desired speed. The different rotation speeds available are 60, 150, 300, 450 and 600 rpm.

The laser beam is more visible at slower speeds. It is possible to stop the rotation and point the

beam manually to view the beam over a long distance at a point.

2-4 Removable Head Guard

The previous model GAT lasers from Agatec (France) manufactured up to 2004 had proud heads to give uninterrupted 360-degree reception to the receiver. The current new models provide a head guard to provide protection in the unlikely event the laser is dropped.

The guard can be simply removed by 4 screws (Hex key provided) – replace the screws back into the body for safekeeping and store the guard

3 Power

3-1 Installing Alkaline Batteries

1. Remove the battery cap located on the rear of the instrument by using a coin or a screwdriver to undo the screw. Do this gently.
3. Insert two alkaline batteries (D size or LR20) ensuring that the polarity (+ or -) is correctly aligned. (See picture above, also indicated in base of battery holder)

3. Replace the battery cap using a coin or screwdriver. Again do this gently, do not over tighten.

3-2 To replace alkaline batteries

When battery power is low, the laser head will stop rotating and the LED located near the on/off key will remain on to indicate low battery power.

Replace both alkaline batteries using the above (3-1) process ensuring that the polarity is correctly aligned.

3-3 Using rechargeable batteries

If your **GAT220** is equipped with a rechargeable battery, the batteries must be charged for 15 hours before first use of the instrument.

1. Insert the charger plug into the jack connector on the battery pack. This is located at the rear of the instrument.
2. Plug the charger into an electrical outlet (240 volts)
3. Charge it for 15 hours. DO NOT OVERCHARGE. DO NOT charge the battery for more than 20 hours.

3-4 Recharging the batteries

The **GAT220** can be charged when working, if electricity is available on the jobsite. Simply plug the charger in and continue working. If the battery is flat you can also

replace it with alkaline batteries while
waiting for the battery to charge up again.

For optimum battery life it is recommended
to re-charge the battery after it has completely
run out. MAXIMUM CHARGING TIME IS
20 HOURS. DO NOT EXCEED THIS.

Ensure that you store and charge the **GAT220**
in a cool and dry place. Damage can occur if
the laser and/or the battery is allowed to
become too hot or become damp.

4 Checking and Adjusting your GAT220

**THIS CHAPTER IS VERY IMPORTANT.
Here are a few simple instructions to check your
GAT220 for correct calibration. Remember that
the laser is a precision instrument and that it is
important that you keep it calibrated and in
proper condition**.

**The accuracy of your job is completely your
responsibility and you should regularly check
your instrument and before each job, no matter
how big or small.**

**Follow the directions below for checking each
axis for calibration. If the laser needs to be
calibrated, follow the instructions below or take
it to a professional service centre**.

**If your GAT220 has been dropped or is
suspected of having a calibration error return it
to your dealer for a calibration check.**

4-1 Horizontal checking

1. Place the laser on a flat surface 30 meters from a wall. Position the laser so that the X-axis is facing the wall.
2. Turn the laser on. When the laser is levelled, stop the rotation so that the beam is at a point.
3. Mark the location of the beam on the wall (X).
4. Rotate the unit 180°. After the laser has levelled, mark the location of the beam near the first mark (X')
5. Both measurements must be at the same place. At 30 meters, the marks should be no more than 2.4 mm apart. This is +/- 0.008% (+/- 8 mm at 100 meters)
6. If the marks are not close enough, the X-axis needs to be calibrated.
7. Make a mark on the wall halfway between X and X'. This mark will be the X calibration point.
8. To check the Y-axis, turn the unit 90° in order that the Y-axis is facing the wall. Repeat steps 2 and 3 and mark the beam (Y)
9. Rotate the unit 180°and mark the location of the beam again (Y').
10. Both marks Y and Y' must be at the same place. At 30 meters, the marks should be no more than 2.4 mm apart. This is +/- 0,008% (+/- 8 mm at 100 meters).
11. If the marks are not close enough, the Y-axis needs to be calibrated.
12. Make a mark on the wall halfway between Y and Y'. This mark will be the Y calibration point.

X and Y Axis Calibration General Information

The laser must be calibrated to bring the beam to the center of the two marks you have defined as above (4-1).

The calibration of the **GAT220** is easily done using the laser keypad.

X axis calibration

1. To switch your **GAT220** to the calibration mode, turn it off.
2. Turn your laser in order that the X or X' axis is facing the wall on which you have made the X mark.
3. Then, simultaneously press on the keys On/Off (1) and Speed Control (3).
4. After a few seconds, release the On/Off key (1). When the X LED (1) is lit.
5. Release the Speed control Key (3) when the X LED (1) indicator is still on.
After releasing the key (3), the X LED (1) will blink fast to inform you that your **GAT220** is ready to be calibrated on the X-axis.
6. Press on key (4) to move the beam up or the key (5) to move the beam down.

Important:
- **The head does not rotate during the calibration procedure; turn the laser head by hand to place the beam into the required position on the target.**
- **DO NOT keep pressing the up or down key. ONE PRESS of the key is EQUIVALENT to 1MM UP OR DOWN.**

Allow 10 seconds for the change to complete before pressing again (The beam stops flashing).

If Y-axis does not have to be calibrated, you can save the X calibration information by pressing the Speed control key (3) on the keypad.

If you think you have made a mistake during this process, press on On/Off key (1) to turn off and come back to the prior calibration.

If Y-axis has to be calibrated, change the calibration axis by pressing the Tilt key (2). The Y LED indicator will blink to inform you that the Y-axis is ready to be calibrated.

Y axis calibration

1. Be sure that the Y LED indicator is blinking on the laser keypad.

    If not:
    - Turn off the GAT220
    - Simultaneously press the on/off key (1) and Speed control Key (3)
    - After a few seconds, release the on/off key (1) when Led (1) is on
    - When Led (1) is still on, release the Speed control Key (3)
   - Press on the tilt key (2) in order that the Y led indicator (2) is blinking

2. Rotate your laser so that the Y-axis is facing the wall (where you have noted the Y and Y' marks).

3. Wait until the **GAT220** has levelled (10 seconds).
4. Move the beam halfway between the Y and Y' marks you have made during step 4-1. Use the key (4) to move the beam up or the key (5) to move the key down.
5. To save the data, press the speed control key (3).
6. To switch off the laser without saving the information, press the on/off key (1).

4-2 Checking for Cone Errors

1. Set up your **GAT220** 1 meter from a wall (A) or a pole and 30 meters from another wall or pole (B).
2. Turn the laser on.
3. When the laser is levelled, stop the rotation and mark the location of the beam (center of the beam) on the near wall (A) using the detector if ambient light conditions are too bright.
4. Mark the location of the beam (center of the beam) on the far wall (B) in using the detector if ambient conditions are too bright.
5. Now place the laser 1 meter from the opposite wall (B'). When the **GAT220** has self-levelled, line up the beam on the previous mark (B).
6. Mark the location of the beam on the wall near the first mark (A') using the detector if ambient light conditions are too bright.
7. Compare the two measurements. If the difference between aa'-bb' is more than 7

mm, contact your local professional
service center to examine your laser.
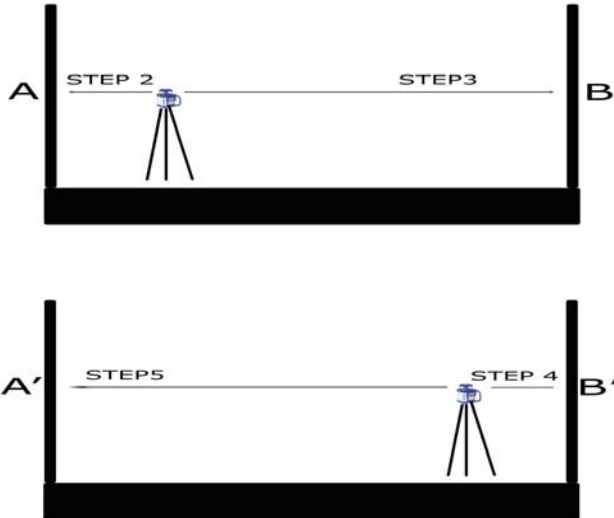
5 Care, Handling and Maintenance

CAUTION: The use of controls, adjustments
or performance of procedures other than
those specified herein may result in
hazardous radiation exposure. If you are
unsure in any way, take your laser to a
professional service centre.

The **GAT220** is a precision instrument, which
must be handled with care. Avoid shock and
vibrations. Always store and transport the
laser and its accessories in the carrying case.

Although your **GAT220** is weather resistant, you must always keep your laser and its accessories dry and clean after use. This will help to maintain battery life and general instrument condition.

Do not store your laser at temperatures below –20°C or above +80°C; electronic components could be damaged if this temperature range is not followed.

Do not store your GAT220 in its case if the instrument or the case is wet. Ensure that the case and the instrument are both completely dry before sealing the case.

To maintain the precision of your **GAT220**, check it and adjust it regularly.

Keep the lenses of the apertures dry and clean. Use a soft cloth and glass cleaner to do this.

Remember to only charge the NiCAD battery when it is completely empty or very close to being so. Recharging batteries that are still useable will shorten their lifespan and reduce their capacity.

ABOVE ALL take good care of your **GAT220** and it will return this care by serving you well in the field for many years.

6 Warranty

The **GAT220** Laser is guaranteed against manufacturing defects for a period of one year. Any incorrect usage, subjection to shock or any other misuse or mistreatment will void this warranty. Under no circumstances will the liability of the manufacturer exceed the cost of repairing or replacing the instrument.

Disassembling the instrument by other than a qualified technician or technicians will also void this warranty.

Specifications are subject to change without notice.

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.

7-1 CR1-E Detector　　　**Fully Waterproof
and
Dustproof to IP-67**

RECEPTION　WINDOW

ON/OFF

LCD DISPLAY

CLAMP

BATTERY PORT
(REAR)

BATTERY DOOR CATCH

Specifications

Operating distance	150 meters
Capture window size	4cm
Accuracy	+/- 0.75mm
Sound	3 settings (high,low,off)
Power	2 AA batteries
Dimensions	11cm x 3cm x 5.5cm

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Operation

1. Press the on/off button once to turn on. Press and hold on/off button to turn off.
2. Press the on/off button briefly to change between high, low and off sound settings.
3. Turn the capture window towards the laser beam and move the detector up or down according to the information given on the LCD display. An arrow facing down will inform you that you have to move the detector down. An arrow facing up will inform you that you have to move the detector up. When a horizontal line appears on the display, the detector is at the same level as the laser beam.
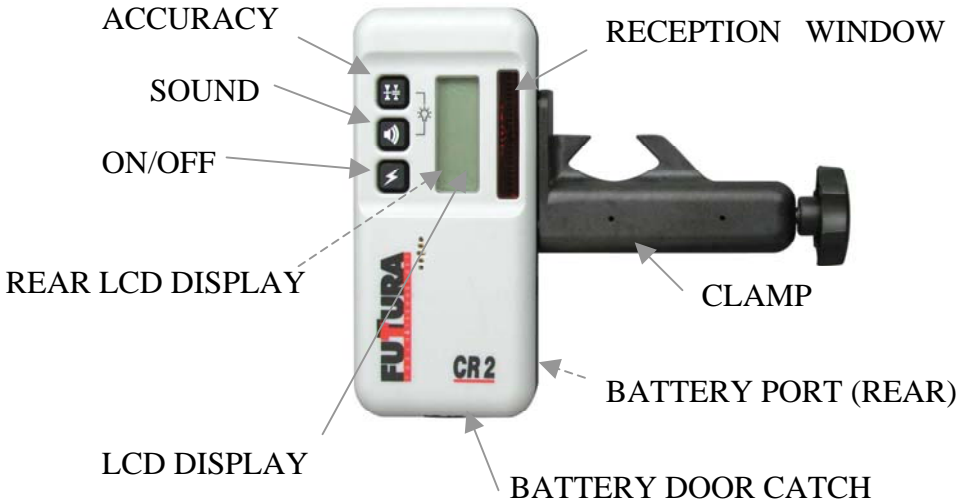
Batteries

The catch for the battery cover is located on the underside of the instrument. Prise the catch open with a screwdriver or similar object. Remove batteries and then insert new ones ensuring that you correctly align the polarity of the batteries (+ or -). Close the battery door.

For further information see Cody Corporation brochure **#7**

7-2 CR2 Detector

**Fully Waterproof
and
Dustproof to IP-67**

ACCURACY

SOUND

ON/OFF

RECEPTION   WINDOW

REAR LCD DISPLAY

CLAMP

BATTERY PORT (REAR)

LCD DISPLAY

BATTERY DOOR CATCH

CR2

Specifications

Operating	600m Radius
Capture window size	5cm
Sound	3 settings (high, low, off)
Power	2 AA batteries
Accuracy Settings	Fine, Medium Wide
Dimensions	11cm x 3cm x 5.5cm

Operation

1. Press the on/off button once to turn on. Press and hold to turn off.
2. Press the sound button briefly to change between sound settings. A speaker symbol will appear at the bottom of the screen to indicate volume setting.
3. Press accuracy button briefly to change between accuracy settings. Arrows will appear at the bottom of the screen to indicate the accuracy mode.
3. Press sound and accuracy buttons simultaneously to turn on/off the screen illumination function for working in low visibility conditions. (front and rear)
4. Turn the capture window towards the laser beam and move the detector up or down according to the information given on the LCD display. An arrow facing down will inform you that you have to move the detector down. An arrow facing up will inform you that you have to move the detector up. When a horizontal line appears on the display, the detector is at the same level as the laser beam.

Batteries

The catch for the battery cover is located on the underside of the instrument. Prise the catch open with a screwdriver or similar object. Pull the plastic tab up to remove batteries. Replace batteries ensuring that the tab is underneath and the polarity is correctly aligned. (+ and -).

For further information see Cody Corporation brochure **#7**

7-3 Tripods

The GAT220 laser can be mounted on a 5/8x11 threaded flat or dome head tripod. You can also use a tripod with an elevating (telescopic) column to adjust the height of the laser.

7-4 Other Accessories

- Laser Glasses: Improve the visibility of the laser beam on vertical surfaces in bright conditions. DO NOT LOOK DIRECTLY INTO THE BEAM.

- Red Magnetic Targets: Improve the visibility of the laser beam in bright conditions. Will quickly attach to any metal surface providing an easy to see reference point.

Calibration Record

GAT220 Serial Number: _____

Receiver Serial Number: _____

DATE	WORK DONE	NEXT DUE	SIGN

Agatec Authorised Reseller