

# Bullet R1 Operation Manual

**WARNING: NEVER LEAVE THE ROASTER UNATTENDED DURING ROASTING!  
ALWAYS UNPLUG THE ROASTER AFTER IT HAS COOLED DOWN!  
ALWAYS DRINK FRESH COFFEE!**


Please read and follow the instructions below. If uncertain about any instructions, please contact a certified Aillio representative by phone (+886) 2 2508 0602 or email: support@aillio.com

The Bullet R1 is a high performance electric coffee roaster with a maximum capacity of 1kg. The Aillio Bullet R1 will be referred to as "R1".

[Click here for this manual in other languages](#)

## IMPORTANT SAFEGUARDS

When using electrical appliances, basic safety precautions should always be followed, including the following:

1. Read all instructions.
2. The temperature of accessible surfaces may be high when the appliance is operating. Do not touch hot surfaces as indicated by the "Warning Hot Surface" sticker:  -- Because contact may cause burns, please use handles or knobs instead. Always allows the Bullet R1 to completely cool before moving or servicing.
3. To protect against electrical shock do not immerse cord, plugs, or roaster in water or other liquid.
4. Unplug from outlet when not in use and before cleaning. Allow to cool before putting on or taking off parts.
5. Do not operate any appliance with a damaged cord or plug or after the appliance malfunctions or has been damaged in any manner. Return appliance to the nearest authorized service facility for examination, repair, or adjustment.
6. The use of accessory attachments not recommended by the appliance manufacturer may cause injuries.
7. Do not use outdoors.
8. Do not let cord hang over edge of table or counter, or touch hot surfaces.
9. Do not place on or near a hot gas or electric burner, or in a heated oven.
10. Do not point space heaters directly at the Bullet.
11. Always attach plug to appliance first, then plug cord into the wall outlet. To disconnect, turn any control to "off", then remove plug from wall outlet.
12. Do not use appliance for other than intended use.
13. The R1 operates at high temperatures, and must be kept away from flammable materials, including chemicals, fabrics, and paper.
14. The R1 must be placed on a heat resistant and slip proof surface that will not allow the roaster to slide. If in doubt, use a silicone mat under each foot of the R1.
15. Allow 10cm (4 inches) of space around the sides and front of the roaster.
16. Never use the Bullet R1 from within a cabinet.
17. Only use the Bullet R1 on a flat, level surface. If in doubt, use a leveler to determine the angle.
18. Never leave the Bullet R1 unattended during preheating and roasting. Also, do not leave the roaster unattended until 2 minutes after the cooling process has started, to ensure no fire is present.
19. Never operate the Bullet when the front plate is not properly attached.
20. There is a risk of the coffee beans catching fire during roasting.
21. The R1 is not a toy, and should not be used by children, or around children.
22. The R1 should be stored somewhere beyond the reach of children.
23. The smoke from roasting may be harmful. Please ensure adequate venting of smoke.
24. This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and

knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

25. Keep the appliance and its cord out of reach of children under 8 years. This appliance can be used by children over the age of 8 years old and persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
26. Children should be supervised to ensure that they do not play with the appliance.
27. Cleaning and user maintenance shall not be made by children without supervision.
28. The Bullet R1 is not intended to be operated by means of an external timer or separate remote-control system.
29. This appliance is intended to be used in household and similar applications such as: staff kitchen areas in shops, offices and other working environments; farm houses; by clients in hotels, motels and other residential type environments; bed and breakfast type environments.
30. Save these instructions

## Revisions

Version	Major changes
1.0	Initial release with the help of the community - thank you all for helping!
1.1	Added Revisions overview. Software section: Added description and pictures to driver installation
1.2	Added more solutions to problem solving section - software
1.3	Adding photos for service & setup
1.4	Added table of contents. Formatting of headings and figures
1.5	Corrected "Cooling the Beans" section
1.6	Added paragraph in Maintenance. How to clean the IR window
1.7	Added additional safety notice for UL compliance. Added instructions on how to unscrew the cover for the motor. Added link on how to clean the IR window
1.8	Added Venting section
1.9	New error messages for different FW versions. Added non critical errors
2.0	Added back to back explanation
2.1	Added explanation of the settings menu
2.2	Added picture to show the device manager in windows
2.3	Added paragraph in Maintenance on how to clean the exhaust pipe
2.4	Added paragraph in Maintenance on the use of compressed air
2.5	Added explanation to "ErC" error 1, during preheat or roasting
2.6	ErC 2 corrected to be drum temperature out of range
2.7	Most sections updated. Added information about the Infrared bean temperature sensor (IBT sensor)
2.8	Updated mechanical check
2.9	Added Only Service Authorized personnel are allowed to repair R1 (M.)
2.10	Removed chapter related to optional software data logging program (M.)
2.11	Added venting section
2.12	Added Chinese User Manual
2.13	Added fan calibration notice under Getting Started section
2.14	Added new steps and description under Critical Errors 6384 section and Fan calibration section.

2.15	Revised 20kg to 30kg under Roasting point 6 in the Important Safeguards section
2.16	Revised FA to F9 under the Seasoning the Drum point 6 in the Getting started section
2.17	Revised 3m to 2.5m under the Venting description in the Important Safeguards section
2.18	Revised Bullet R1 V2-110V Model / Input Voltage under Specification section from 100V~127V to 110V~127V
2.19	Added German User Manual
2.20	Added Japanese User Manual
2.21	Added French User Manual

## Alterations Service & Accessories

- Do not modify the R1.
- Do not disassemble R1. Only authorized service personnel are allowed to repair malfunctions.
- Unless recommended by Aillio, accessories must not change the operation of the coffee roaster or interfere with normal operation.
- Do not operate the Bullet R1 if not fully assembled. This includes connecting the chaff collector.
- Do not operate the coffee roaster if it is damaged or you suspect a malfunction.
- Do not attempt to service the roaster yourself. The use of accessory attachments other than those supplied or recommended by the manufacturer may cause hazards and can void your warranty.
- The fuses on the induction power board within the chassis beneath the drum are not replaceable. If the unit shuts down, or doesn't turn on, please do not open the PCB enclosure for self-repair, but go to authorized service for a complete appliance check.

## Electrical

- To avoid electric shock, do not operate the roaster in a wet environment or near water. Any cleaning should be with a moist or dry cloth and should only be performed when the roaster is cooled down and with the power cord disconnected. Please see the cleaning section.
- The power cord and USB cord must be arranged in such a way that they will not be tripped over, or able to pull the roaster off the table. Keep the cords away from the front part of the roaster, which may get very hot and can melt the wire.
- The Bullet needs a dedicated electrical circuit with ground (earth). Do not plug other appliances into this circuit.
- If an extension cord is needed, please make sure it meets the minimum requirements of power rating and is fully grounded (earthed). Do not connect other appliances to the extension cord.
- Always disconnect the power cord after the roaster has cooled down.

## Mechanical

- Never touch moving parts, and do not place hands or fingers inside the drum while the coffee roaster is connected to the mains.
- The coffee roaster is heavy, and care should be taken when moving the roaster. Only move the roaster when it is completely cooled down. Do not lift the coffee roaster by the legs, door handle or cords.

## Roasting

- When the coffee beans are dropped into the cooling tray, they are extremely hot, and should not be touched until they have cooled completely.



- The operating environment should be clean and free from dust and sand.
- The R1 is only intended for roasting coffee beans. Roasting other foods will void the warranty.
- After roasting has finished, the R1 will enter a cool down mode which will cool the drum. DO NOT disconnect the power until this cooling cycle has finished or you risk damaging the electronics.
- The Chaff Collector should ALWAYS BE INSTALLED while roasting and needs to be emptied and the filter cleaned after each roast.
- After roasting 30Kg and while the roaster is cool, remove chaff under the drum. Refer to cleaning instructions.

## Venting

During roasting, smoke is produced which should be vented to the outside or to a smoke suppression filter. If roasting in the kitchen, a powerful range hood can be used. Place the R1's air outlet directly underneath the range hood.

For fixed installations a pipe (not included) can be connected to the R1 to vent the smoke outside or to a filter. It is recommended to use a metal pipe or flexible hose with a diameter of 75mm (3 inches) or larger. If the pipe or hose is directly attached with an adapter, the length of the pipe / hose should not be longer than 2.5m. If the pipe / hose is longer, a suction fan should be placed at the end of the pipe / hose to ensure adequate airflow. Please be aware that the suction fan can affect the performance of the R1 by increasing the airflow, thus potentially removing too much heat.

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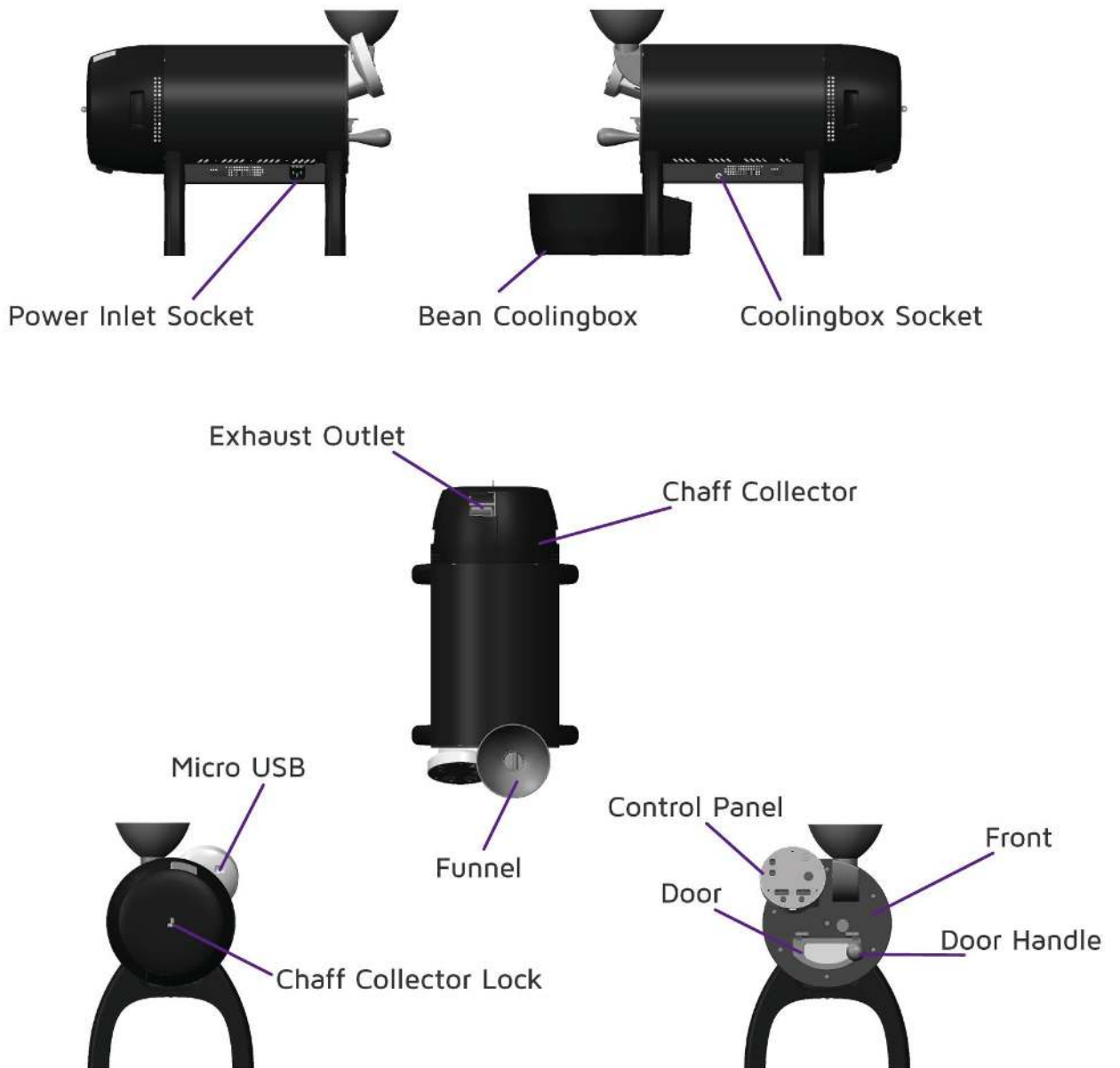
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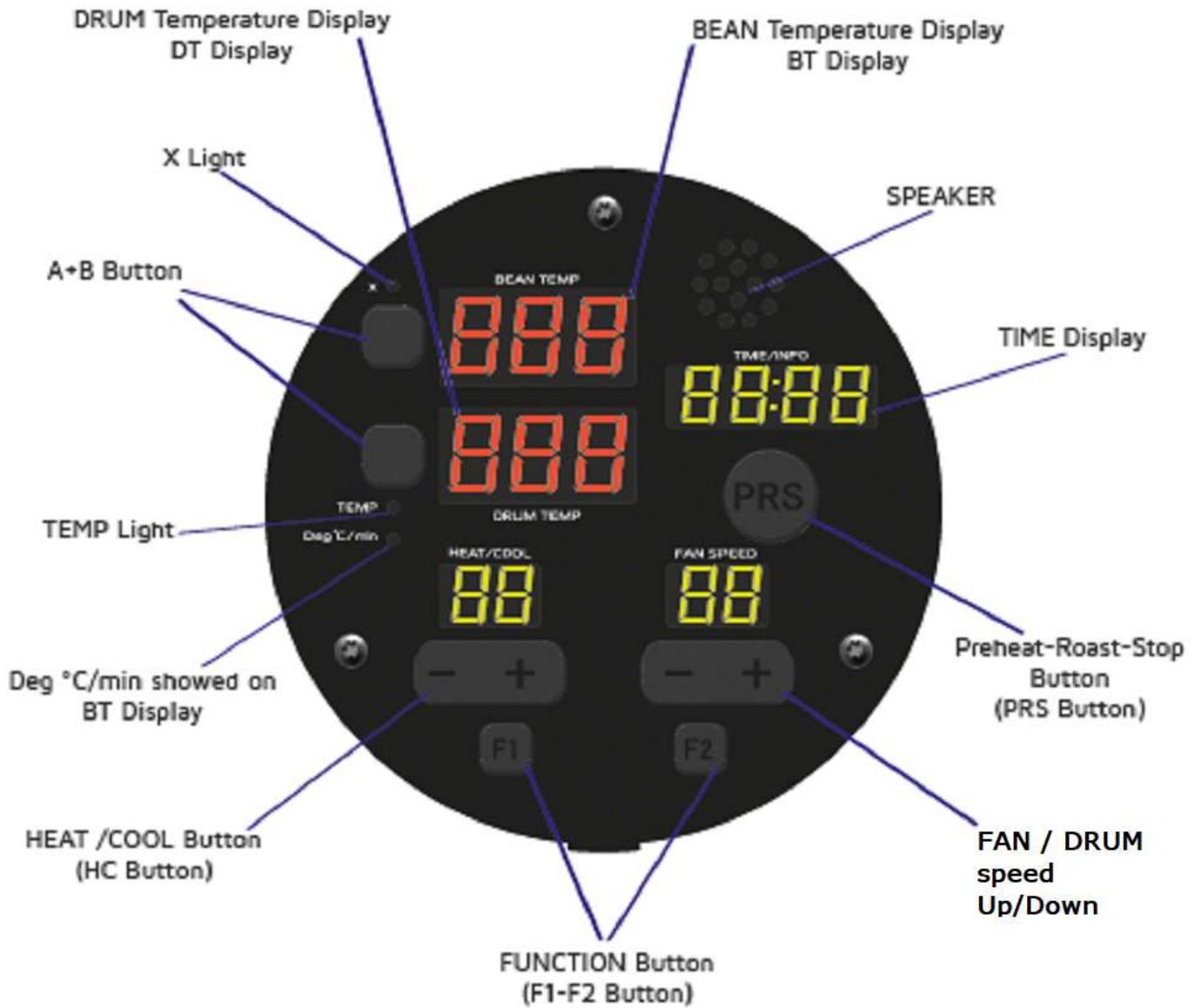
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# Getting started

## Roaster overview



## Control panel overview



## Control Panel Overview



## Unpacking and preparing the R1

### Mechanical Check

After receiving the R1, please inspect the packaging for any damage. If you are in doubt, please contact the shipping company, and document the damage.

After shipping or moving the roaster, there are a few things that should be checked before roasting can begin. The purpose of this check is to adjust drum to front plate clearance, pulley clearance, and belt tension.

- Make sure the Drum is in the most forward position as described in "Maintenance"
- Take off the chaff collector. Make sure the pulley set-screws are snug as described in "Maintenance"
- Plug in the roaster. Press PRS three times to enter Roast Mode and then set Heating to PO. Listen for any obvious metal against metal scraping sounds.
- If you see rust on the drum, do not be alarmed. It is normal for an unseasoned drum to oxidize and this will disappear during seasoning.

## Seasoning the Drum

Before you can roast any coffee for consumption, you will need to do a minimum of 3 roasts to season the drum. The oils from the coffee will help seal the steel drum so that it will not rust and it will create a more smooth surface inside the drum. The drum may not be fully seasoned until 5 to 10 roasts have been completed but after 3 seasoning roasts you can drink the coffee you roast. Each seasoning roast should be performed with 400-500g of green beans. (There is no need to use your 90+ coffees at this point:-) )

1. For newer models (V1.5 / V2.0) with the IBTS sensor the preheat should be set to 230°C (445°F). For the older model V1 the roaster should be preheated to 160°C (320°F).
2. Press PRS to start preheating
3. When the preheat temperature has stabilized at 230°C (160°C for the old model V1), press PRS and the control board will start to flash.
4. Add 400-500 g of beans, and this will start the roast.
5. Once the roasting has started, make sure the drum speed is set to D9 for fastest rotation by pressing F2 button and using the up and down buttons to set D9.
6. Roast the coffee on P7 all the way until after the end of the second crack when the coffee is dark and shiny. Instead of dumping the beans into the cooling tray, you can turn off the induction power (PO) at the end of the roast, and run the fans at F9 while keeping the beans in the drum for a few minutes. Then open the door and dump the beans.
7. Repeat this procedure at least 3 times

These beans are not for consumption! Trust us! Machine oil doesn't taste good!

It is very important to not heat the R1 to a higher preheat temperature than 230°C (160°C / (320°F for the old model V1) as the IR sensor will give a different measurement for non-seasoned drums.

### **IMPORTANT NOTICE**

- For R1 V1 it is important to clean the IR window on the inside of the front plate after seasoning. For V1.5 and V2.0 there is no IR glass to clean. See the maintenance section to learn how to do this.
- Drum speed should be set to D9 for the first 10 roasts. This is to prevent beans getting stuck and potentially pushing the door open. After about 10 roasts, the surface should have less friction and the drum speed can be lowered.
- For 220V CE certified Bullets, there is no need to calibrate the Exhaust Fan before seasoning. All CE certified units are fan calibrated out of the box.

# Operating the Bullet R1

## Operating modes

The PRS button controls the different cycles of the roasting process. Pressing this button will cycle through each roasting step.

### Off Mode

The roaster is ready to preheat. The power up and down buttons will select your preheating temperature.

If you have already completed a roast, the drum may rotate in this mode. Cooling fans are off, but pressing F2 will start the blower to cool down the R1 if the drum temperature is higher than 80°C (176°F).

### Preheating Mode

The roaster will start preheating to your desired setpoint. The display will show PH while heating to the setpoint and PH A once it begins to keep a steady temperature. Once ready after approximately 20-25 min, the R1 will automatically go to Charge Mode.

### Charge Mode

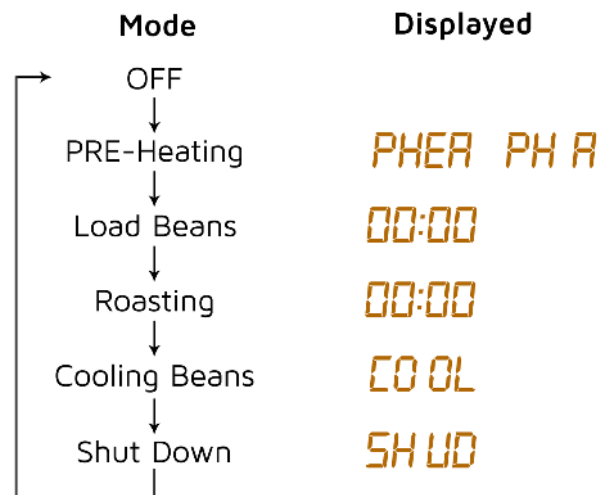
The R1 is ready to roast and you should pour the green beans into the roaster through the funnel. Once loaded, the R1 will automatically go to Roast Mode. While in Charge Mode, the R1 display will blink and it will say "Charge".

### Roast Mode

You are roasting coffee! The induction power, exhaust fan speed and drum speed can all be adjusted.

### Bean Cooling Mode

You must press the PRS button to enter this mode. The cooling tray fan will start and the blower will be set to program 7. The drum speed is set to the optimal speed to drop your beans into the cooling tray.



### PRS Button Cycles

## Shut Down Mode

You must press the PRS button to enter this mode. The cooling tray will turn off and the roaster will start cooling down. Once the drum temperature is below 80°C (176°F), the R1 will go back to the Off Mode. If you wish to begin another roast, press the PRS button to go to the Off Mode. The drum will continue rotating if above 120°C (248°F), but the exhaust fan will not run and cool down the R1.

## Back-to-Back Roasting

To start a new roast while the beans are still being cooled down, press F1 in the Bean Cooling mode. The clock display will show BAC indicating that you are doing a back to back roast. To begin again, set your preheat temperature and press PRS. To stop the cooling tray, press F2 to toggle to the C value, which is the speed of the cooling tray and press the down button to lower the speed. Once 0 is reached, the option to control the cooling tray will disappear and only Fan and drum speed will be available using F2.

## Settings Menu

In the settings menu you can change the following:

Celsius / Fahrenheit temperature reading, sound volume, default drum speed at roasting, default starting power at roasting, and default preheat temperature.

When the R1 is in Off mode, press F1 to enter and toggle through the menu. The clock display will tell you which menu item you are currently changing. To exit the menu keep pressing F1 until the Off appears in the clock display.

1. CEL / FAH is displayed. Press the A button to toggle between Celsius (CEL) or Fahrenheit (FAH), see fig. 11
2. SOU - Adjust the sound settings
3. drU - press the Fan speed buttons up/down to select the default drum speed when the roast starts, see fig. 13
4. Pro - press the HC buttons up/down to select the default power when the roast starts, see fig. 14
5. PH - press the HC buttons up/down to select the default preheat temperature when the R1 starts up, see fig. 15

## Fan Calibration

It is possible to re-calibrate the fans so each fan setting is more linear. If you change your fan motor then you will need to calibrate your fan again. If the A-01 error code is being triggered, please also try calibration first.

Below is an Exhaust Fan RPM chart for reference. The RPM readings of a calibrated Exhaust Motor should have similar values (+/- 10%) in the corresponding fan settings:

Fan Setting	Calibrated RPM
F1	600~
F2	800~
F3	1000~
F4	1300~
F5	1500~
F6	1700~
F7	1800~
F8	2100~
F9	2300~

To calibrate, please follow these steps:

1. Take off your chaff collector (note: NOT just the chaff filter)
2. Turn on the Bullet and go to the menu section 6 by clicking F1 until the clock LED shows 6.
3. Press the "A" button (top left button) If no calibration has been done before this should start the process.  
Or
4. Start the calibration process by clicking both fan Up(+) and Down(-) buttons at the same time.  
Now the calibration starts and this can take about 5 minutes to complete. When it is finished the Bullet will beep for two seconds and flash P8D.
5. After the calibration, you can toggle between un-calibrated or calibrated fan speeds by clicking the "A" button in menu 6. 3 dashes - - - is un-calibrated and P-d means calibrated.

\* For CE-certified 220V units. Follow these steps

1. Take off your chaff collector.
2. Take out the chaff filter from the chaff collector.
3. Open the chaff collector silicon plug.
4. Take off the bean chute plug.
5. Take out the tryer.
6. Place back the chaff collector.
7. Turn on the Bullet and go to the menu section 6 by clicking F1 until the clock LED shows 6.
8. Press the "A" button (top left button) If no calibration has been done before this should start the process.  
Or



9. Start the calibration process by clicking both fan Up(+) and Down(-) buttons at the same time.

Now the calibration starts and this can take about 5 minutes to complete. When it is finished the Bullet will beep for two seconds and flash P8D.

10. You can toggle between un-calibrated or calibrated fan speeds by clicking the "A" button in menu 6. 3 dashes - - - is un-calibrated and P-d means calibrated.



fig.11



fig.12



fig.13



fig.14



fig.15

## Roasting coffee

### Preparing a roast

1. Place the R1 on a suitable table and connect the cooling tray cable to the connector on the right side of the R1
2. If the R1 has been moved around, make sure the drum is at the most forward position by opening the door and pulling the drum forward toward the front plate. Make sure the drum is cool before doing so.
3. Connect the power cord to the Bullet first, then to the wall socket.
4. Ensure that the bean chute lid is in place.
5. Once the R1 is ready, it will indicate this by the display showing OFF (Fig. 1).



fig.2

### Preheating the R1

1. Set your desired preheat temperature by using the H/C buttons (Fig. 3). Refer to the table on page 34 for recommended settings.
2. Press the PRS button, which will start the preheating process (Fig. 4).



fig.3

The R1 will now preheat the drum to the temperature you have set. Once the temperature has been reached, it will maintain this temperature until beans have been charged, as detected by the bean temperature derivative (ROR) being below  $-20^{\circ}\text{C}$  ( $54^{\circ}\text{F}$ )

### Notice

Under some circumstances the R1 will not automatically enter Charge Mode. This can be caused by a low ambient temperature, excessive airflow around the R1, external exhaust flow which increases airflow etc. You can manually press the PRS to enter Charge mode in these cases. If the R1 has not entered Charge Mode after a period of 35 minutes, it is necessary to manually press the PRS button to enter the Charge mode.



fig.4

## Charging Beans

1. When the display starts flashing, the R1 is ready to start roasting (Fig.5).
2. Remove the bean chute plug and insert the funnel into the chute. The lip of the funnel should face backwards to cover the exhaust pipe.
3. Load all of the green beans into the R1 at the same time.
4. The R1 will automatically detect that the beans have been loaded and will change to Roast Mode and start the timer.
5. After all the beans are loaded, pull out the funnel and replace the bean chute plug.
6. Be careful not to press the PRS button until you want to finish the roast.

flashing

fig.5



## Notice

If you are roasting very small batches, the R1 might not be able to detect that the beans have been loaded. In this case, you can start the timer manually by pressing the PRS button.

fig.6

## Roasting

1. While roasting, you can control the heating, exhaust fan, and drum RPM. To change the heating, use the H/C buttons (Fig. 6, left). To control the exhaust fan, use the FAN buttons (Fig. 6, right). Please note that fan speeds 6-9 are strong enough to make the temperature drop dramatically and should be used with care.
2. The FAN buttons also control drum RPM. To change between the two, use the F2 button. Drum RPM is marked by a "d", and fan speed with an "F" (Fig 8).
3. The DT display can show the rate at which the bean temperature is going up or down. The display value is °C/min (°F/min). Some roasters also refer to this as rate of rise (ROR) (Fig. 7).
4. Bullets with the IBTS (V1.5 & V2.0) will by default show the IBTS temperature as the Bean Temp. The X-LED light above the A button will be ON when the temperature is from the IBTS and OFF when displaying the bean probe temperature. By pressing the A



fig.7







## Turning off the R1

Please note that it is important to allow the R1 to cool down after you are done roasting. Do not unplug the R1 until the display shows OFF, the drum has stopped rotating, and the temperature of the drum is less than 80°C (176°F). The exhaust fan setting can be increased in order to speed this up.

Before moving the R1, make sure to disconnect the cooling box USB cable and the power cord.

After every roast session, it is a good idea to empty the chaff collector and check to see if the filter basket needs cleaning. Disconnect the cable to the cooling box by unscrewing it, remove the basket, and empty the chaffs from the cooling box.

### **IMPORTANT NOTICE**

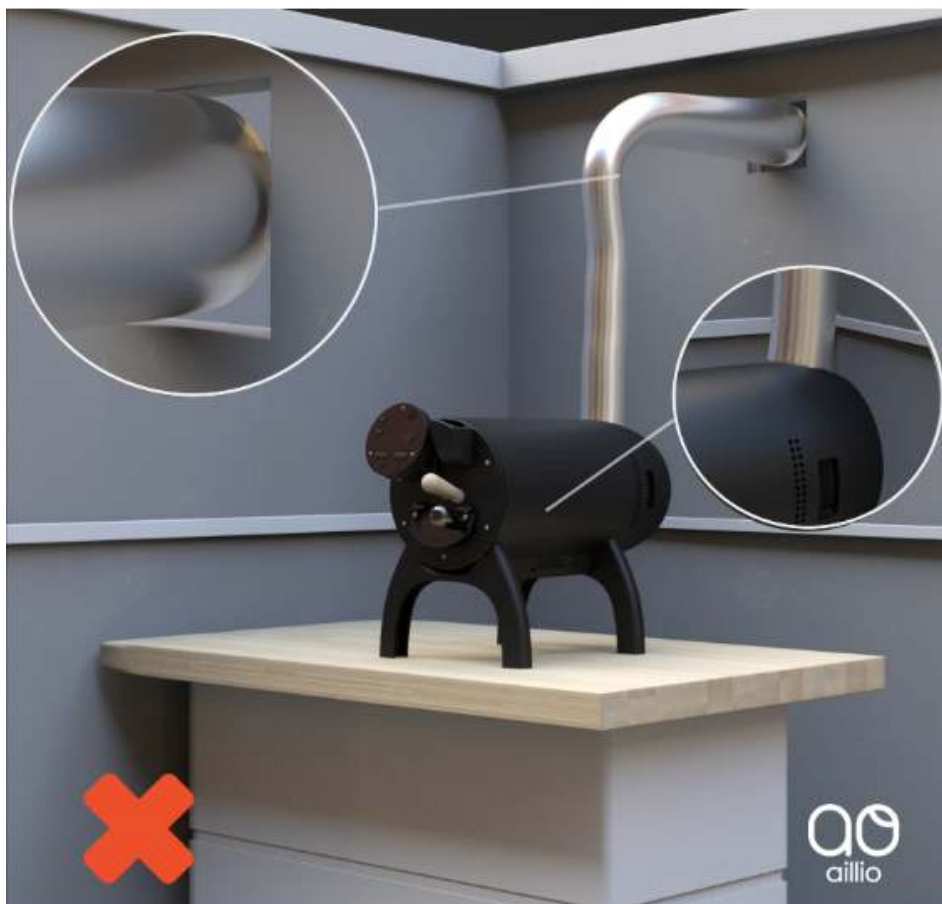
It is imperative to keep the R1 connected to the mains power while it cools down. This will keep the cooling fans running to cool both some sensitive mechanical parts as well as the electronics and the IBT sensor. Unplugging the R1 before it has completely cooled will damage it.

## Venting the Bullet R1

The wrong exhaust setup for the Bullet could potentially damage the roaster and void the warranty. Please take care to make sure that your exhaust system is functioning properly.

### Sealed Venting Setups

Whether active or passive, sealed venting solutions can sometimes create problems.



- In the example above, the sealed, passive vent to the outdoors is susceptible to shifts in the wind that could funnel air back into the roaster, potentially leading to inconsistent roasts, as well as chaff and overheating issues.





- In the next example, the sealed, active (with a fan) vent may pull too much air out of the Bullet when it is running. This, too, can affect the airflow within the Bullet and lead to inconsistent roasts.

## Open Venting Setups

An open venting setup is easier to manage effectively, as there is no risk of interfering with the Bullet's internal airflow.



- The example illustrated above is ideal. It is active (with a fan) and so not susceptible to conditions outdoors. (For tubing longer than 2.5 meters, an active fan is often needed to properly vent the Bullet R1.) Most importantly, there is also a gap between the vent and the exhaust, so that the Bullet's airflow remains unaffected.





- Another common way to vent the Bullet with a sealed connection is using an oven hood. This solution works well for light roasts. And because it's not venting to the outside or pulling a lot of air, the seal is no problem. Please understand that this kind of set-up will not work with long tubing -- keep it less than 2.5 meters.

# Maintenance

## Cleaning

To keep the R1 in prime roasting condition, there are a few cleaning procedures that need to be carried out on a regular basis.

### After every roast session

Empty Chaff Collector and Bean Cooling Box

- To release the chaff collector, pull the lock backwards with one hand while holding the chaff collector in the other and releasing it sideways from the R1
- Place it over a trash bin and open the silicone plug by pulling the tab.
- Give the chaff collector a few gentle knocks to release chaff from the inside ribs.
- Check to see if the filter basket needs cleaning. If it needs a cleaning, follow the steps below:
  - Remove the filter from its rubber seat with a gentle, twisting motion.
  - Use warm water and a brush to remove the chaff collected on the screen. When excessive oils accumulate inside the chaff collector, use an espresso backflush cleaner solution to remove them, then rinse them with water thoroughly.
- Replace by reversing the steps above.

### After 10kg

Clean the IR window on the inside of the front panel. Please note that this is only necessary if you have a V1 Bullet without the new IBTS. Bullets fitted with the IBTS do not require the IR window.

How frequently you need to clean the IR window depends on how dark you roast. If consistently roasting into 2nd crack, the IR window may accumulate soot and oil faster. The easiest way to clean the window is by removing the six screws from the front plate. Carefully lift off the front plate and check the amount of dirt on the IR window. The window should look shiny like a piece of glass. If not, use isopropyl alcohol on a piece of cloth or cotton swab to clean it. You can also use espresso backflush cleaner solution.

[Click here for a guide](#)

Only remove the IR window from its holder if you suspect there might be dirt behind it, as there is a high risk of damaging the glass. (If it's damaged, please contact us to upgrade to IBTS).

### SAFETY NOTICE

If the IR window is dirty, the drum temperature will not be measured correctly. This can lead to the R1 overheating, potentially damaging it. One indication of a dirty IR window



is when the temperature of the bean probe is close to the drum temperature during preheating.

## **After 30kg**

Remove the cooling box filter, chaff collector filter and exhaust fan impeller. Wash them in mild soap or an espresso backflush cleaner. Make sure the cooling box filter is dry before reinstalling it.

Vacuum chaff and beans that might be stuck under the drum. You can do so by opening the door and vacuuming at the edge of the drum.

The external parts of the R1 can be cleaned with a moist cloth or a small amount of alcohol sprayed onto a clean cloth. Make sure the roaster is unplugged while cleaning.

## **Exhaust pipe**

Depending on the volume roasted, you should inspect the exhaust pipe yearly to ensure that there is no buildup of chaff and oils. The cleaning can be done with a bottle cleaning brush. Taking out the exhaust pipe is not recommended and will void your warranty, as you risk damaging the insulation on top of the pipe.

## **Using Compressed Air**

DO NOT use a compressed airgun directly into the front of the roaster as you will damage the insulation tube. You can use compressed air on the back of the roaster, and it can also be applied in the air intake, next to the drum pulley.

# Problem solving

## Mechanical

**Symptom:** A grinding / metal-on-metal noise is heard when the drum starts rotating:

**Cause:** Drum or pulley is not aligned.

**Tools Needed:** Hex Key 2 & 3mm

**Solution:** Stop the roaster by holding down the PRS button for 3 seconds. The roaster will go back to OFF mode. If the drum is hot, let it cool down first. Once the drum is cooled, open the door, grab the diagonal triangle and pull the drum forward towards the front. When pushing the shaft from the front bearing, the shaft should be able to move about 1mm back, but should return to the front position by itself. If this does not happen, pull the drum as mentioned above. Start the preheat cycle to see if this has solved the problem.

If a grinding noise is still heard, remove the chaff collector and inspect the pulley, There should be a clearance of about 1mm from the pulley to the cover which holds the chaff collector. If the pulley is rubbing on the cover, make sure the drum is pulled all the way to the front, and then re-adjust the pulley by loosening the set screw.

If a noise is still heard, remove the front by unscrewing the 6 hex screws on the front. Add a larger shim to allow more clearance between the drum and the front plate. You can combine shims if needed

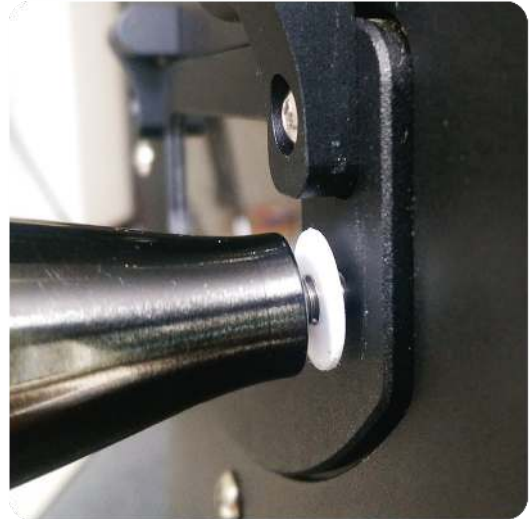


**Symptom:** A noise is heard when door is closed but not when it's open:

**Cause:** The set screw that holds the door handle is protruding and rubbing on the drum.

**Tools Needed:** Hex Key 2.5mm

**Solution:** Loosen the door handle and screw the set screw deeper into the handle so that it's flush with the back of the door.



**Symptom:** A loud (da da da da da da) noise is heard when the drum starts turning:

**Cause:** The belt is loose. (On Bullets without motor spring)

**Tools Needed:** Hex Key 3 & 4mm

**Solution:** Unmount the chaff collector and take off the right back cover by unscrewing the 4 hex screws that are in the same location as the alignment pins on the chaff collector. After the cover is off, loosen the two bolts that hold the drum motor. Pull the drum motor bracket to the right (when looking at the R1 from behind) and tighten the top screw first, then tighten the bottom screw. When you feel the two screws cannot be tightened further, stop. Reattach the cover by using a hex screwdriver with a straight head. Round headed drivers are very hard to use.



Remove 4x M4 Screws behind cover.  
Use a 3mm flat hex key



**Symptom:** The drum stop spinning after loading beans, but no thumping sound is heard

**Cause:** The motor pulley is not tight

**Tools Needed:** Hex Key 1.5, 3 & 4mm

**Solution:** Unmount the chaff collector and take off the right back cover by unscrewing the 4 hex screws that are in the same location as the alignment pins on the chaff collector (see the previous symptom). After the cover is off, loosen the two bolts that hold the drum motor completely and carefully take off the motor in its bracket. Re-align the motor pulley with the shaft so that the screw securing the pulley will touch the flat part of the shaft. Tighten and reassemble making sure to tighten the belt when mounting the motor bracket



## Electronics

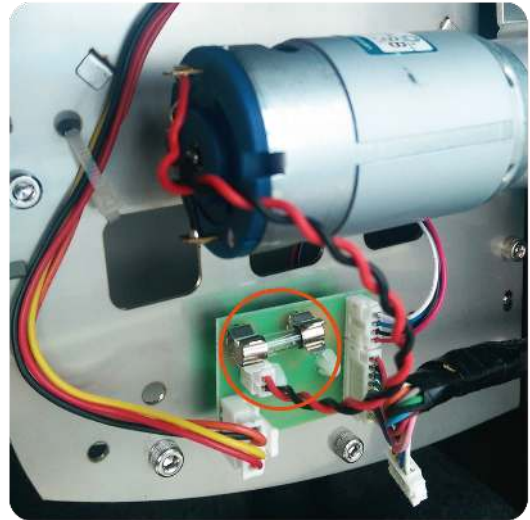
**Symptom:** Drum does not start turning, and no sound is heard:

**Cause:** Drum motor is faulty, or fuse is blown.

**Tools Needed:** Hex Key 3mm

**Parts Needed:** 1,6A, 20mm Fuse

**Solution:** Unmount the chaff collector and take off the right back cover by unscrewing the 4 hex screws that are in the same location as the alignment pins on the chaff collector. On the small PCB connected to the drum motor, there is a fuse. Inspect it and if blown, replace with a 1.6A 20mm fuse.



## Heating

**Symptom:** R1 Does not heat up the drum

**Cause:** See table below.

**Tools Needed:** Hex Key 2&2,5mm

<b>Symptom:</b>	<b>Cause:</b>	<b>Solution:</b>
Drum does not heat up	Power is set to P0	Set Power to P1-P9
	Power PCB Faulty	Contact us





# Basic guide to roasting coffee.

(If you have never roasted coffee, then this is the guide for you)

## The Basics of Coffee Roasting

The R1 is a classic solid drum roaster, which means it is the most common type of roaster used by professional coffee roasters.

Before beans can be added to a drum roaster, the drum must be preheated. When the drum is at the desired temperature, the beans can be loaded, and the roasting begins.

We can simplify the roasting process by looking at the three basic variables that have the biggest influence on how coffee is roasted: Preheat temperature, drum heating (how much heat is applied to the drum), and the exhaust fan suction. Together, these three variables will determine your roast profile. There is no “perfect” roast profile. Each roaster operator will treat beans differently, and thus will have their own profile. To generalize, most roaster operators will aim for a roasting time of 7-15min.

In the table below, you can see examples of preheat temperatures for different amounts of coffee.

We have users roasting as little as 100g at a time. This is probably too little for useful bean probe data, but still quite doable. We also have many users roasting up to 1kg or more at a time with good results, while others prefer to drop down to 700g or even 500g or 350g.

There are a lot of factors influencing this, including such things as the density of the beans (500g of dense beans will behave differently than 500g of less dense beans). And in fact, many of our users prefer different charge sizes based off the beans they happen to be roasting.

There is no real ‘sweet spot’ for the Bullet R1, but a 1kg charge of some beans may take longer to get to first or second crack than you would like, or you may have more difficulty controlling the roast with less head room, in which case we'd recommend dropping the charge weight down.

We also strongly advise you to pick a single batch size -- any size -- and stick with it for the vast majority of your roasts at the beginning. In this way there will be one less variable in your roasts and you will learn the nuances of individual beans and of the roaster settings a little more quickly.

These following setting suggestions are only meant as a starting point, and you are encouraged to experiment.



## Recommended Preheat Temps and Power Settings (Celsius)

Weight [g]	V1 Preheat Settings	IBTS Preheat Settings	Starting Power
350	160°C - 180°C	200°C - 240°C	P5-P7
500	175°C - 190°C	230°C - 275°C	P6-P8
750	185°C - 205°C	275°C - 310°C	P8-P9
1000	205°C	310°C	P9

## Recommended Preheat Temps and Power Settings (Fahrenheit)

Weight [g]	V1 Preheat Settings	IBTS Preheat Settings	Starting Power
350	320°F - 356°F	392°F - 464°F	P5-P7
500	347°F - 374°F	446°F - 527°F	P6-P8
750	365°F - 401°F	527°F - 590°F	P8-P9
1000	401°F	590°F	P9

### \*\*\* A Note About Preheat Settings on the Bullet R1 \*\*\*

As noted above, preheat settings will vary according to whether you have the Infrared Bean Temperature Sensor (IBTS) installed. Serial numbers 1425 and above all ship with the IBTS pre-installed. All other Bullets will need to purchase the sensor separately in order to use it. Again, these settings are suggestions and you are encouraged to experiment.

### \*\*\* A Note About Bean Temperature Readings on the Bullet R1\*\*\*

The original Bullet R1 (serial numbers below 1425) shipped with an infrared sensor for measuring drum temperatures during preheat, and also with a traditional bean temperature probe. These Bullets lack the IBTS and will only give one bean temperature reading during the roast.



For Bullets with Serial Numbers 1425 and above, and also for those who have purchased the Infrared Bean Temperature Sensor (IBTS) separately, there will be two bean temperature readings. One of the readings is from the traditional bean probe, the other is from the IBTS, which measures both drum temperature during preheat and bean temperature while roasting. You can now toggle between the two readings on your Bullet R1 by pushing the (A) button on the control panel. When the (x) light is on, it displays the temperature reading from the IBTS, which gives a more accurate reading than the original, traditional probe.

## **V2 Roast Recipe Example: 350g**

The following roast should finish in about 10 minutes or less.

**Roast Level:** Light

**Weight:** 350 grams

**Preheat:** 220°C

**Charge Settings:** Power 7, Fan 2, Drum 9

**Infrared Bean Temp@120°C:** Power 6, Fan 3

**Infrared Bean Temp@165°C:** Power 5

**Infrared Bean Temp@190°C:** Power 4

**Infrared Bean Temp@200°C:** Fan 4

**<First Crack Begins@196–204°C >**

**45–90 seconds after First Crack:** *End the Roast*

## Button function in each mode

Firmware up to and including V385

Buttons / Mode	PRS	F1	F2	PWR Up/Down	Fan Up/Down	A	B
<b>Off</b>	Start Preheat	Toggle through settings menu	Start stop exhaust fan (if drum temperature is higher than 80 deg) Useful for cooling off the roaster	Change preheat temperature			
<b>Preheat</b>	Go to Charge mode- overriding automatic change to Charge Mode						Toggle DT display
<b>Load</b>	Go to Roast Mode- overriding automatic change to Roast Mode						Toggle DT display
<b>Roast</b>	Go to Cool Beans Mode		Toggle between exhaust fan and drum speed	Change power setting	Change exhaust fan speed/ Change drum speed		Toggle DT display
<b>Cool Beans</b>	Go to Cool Drum Mode			Change cooling box Fan speed	Change exhaust fan speed		
<b>Shut down</b>	Go to Off Mode						

Firmware after V385

<b>Buttons / Mode</b>	<b>PRS</b>	<b>F1</b>	<b>F2</b>	<b>PWR Up/Down</b>	<b>Fan Up/Down</b>	<b>A</b>	<b>B</b>
<b>Off</b>	Start Preheat	Toggle through settings menu	Start stop exhaust fan (if drum temperature is higher than 80 deg) Useful for cooling off the roaster	Change preheat temperature	Change cooling tray fan speed (during back to back roasting)		
<b>Preheat</b>	Go to Charge mode- overriding automatic change to Charge Mode				Change cooling tray fan speed (during back to back roasting)		Toggle DT display between DT and RoR
<b>Charge</b>	Go to Roast Mode- overriding automatic change to Roast Mode				Change cooling tray fan speed (during back to back roasting)	Toggle between IBTS and Traditional Bean Probe (V1.5 and 2.0 only)	Toggle DT display between DT and RoR
<b>Roast</b>	Go to Cool Beans Mode	While connected to PC, this will mark first crack in RoasTime	Toggle between exhaust fan and drum speed	Change power setting	Change exhaust fan speed/ drum speed / cooling tray fan speed (during back to back roasting)	Toggle between IBTS and Traditional Bean Probe (V1.5 and 2.0 only)	
<b>Cool Beans</b>	Go to Cool Drum Mode	Start Back to Back roast	Toggle between exhaust fan /drum speed / cooling tray speed	Change cooling box Fan speed	Change exhaust fan speed/ drum speed / cooling tray fan speed (during back to back roasting)		
<b>Shut down</b>	Go to Off Mode						

# Error messages

## Critical Errors

When a critical error is found, the display for the bean temperature will show “ErC”. The induction will be forced off.

The corresponding error codes are shown in the clock display:

Error message	Description	What should I do
ErC 0001	Bean temperature exceeds 245°C (473°F) and the induction will stop heating	<ul style="list-style-type: none"> <li>• If you get the error during roasting you should finish your roast and let the Bullet cool down.</li> <li>• If you get the error during preheating or charge mode you should immediately cancel the preheat and go to the cooling mode to let the Bullet cool down. You should then check your IR glass and clean this.</li> </ul>
ErC 0002	Drum temperature exceeds 330°C IBTS FW 500+ /Non IBTS models 220°C (428°F)	Finish your roast as you normally would
ErC 0004 / 0008 / 0016	Ambient temperature is too high.	Finish your roast and let the R1 cool down before starting a new roast.
ErC 0032	Induction heating electronics is too hot and the power has been set to PO	Give the Bullet a minute to cool down and you can set the power again. Firmware 558 fixes this problem for most people. The error can also show up at very low temperatures with older firmware
ErC 0128	Dead man’s switch. No human presence for 3 min	Press any button to override and continue roasting. You must set the power and fan again.
ErC 0256 ( only Firmware before version 386 )	Input voltage was too low	Make sure your cable to the R1 is as short as possible and is rated for 10A for the 220V version and 15A for the 110V version.
ErC 0480	Small and Big coil fans are not spinning	Contact us for assistance
ErC 0512	Input voltage was too high	First make sure you have the latest firmware. Check if the drum can spin freely. This error

		can also occur if the bearing is not seated correctly in the front place, making the drum difficult to spin. If error persists then contact us.
ErC 1024 / 2048 / 3072	Bean probe failure	Make sure the bean probe is in the right connector on the control board. Contact us for a replacement part if yes and error persist.
ErC 4096	Induction cooling fan 1 (the big one under the lid) is not spinning.	Contact us for assistance
ErC 6384	<p>Induction cooling fan 2 (the small fan that is visible on the rear bottom of the Bullet chassis when removing the chaff collector) is not spinning.</p> <p>*CE version 220v Bullet only. If the chaff collector is not installed during Preheating, Roasting mode, or OFF mode while the temperature is still hot, the power of the induction cooling fan 2 would be cut and triggers ErC 6384. It could also be that the power cut protection switch has failed.</p> <p>*CE version 220v Bullet only. If the Chaff Collector is not installed when performing fan calibration.</p>	<p>Check that the fan is not being blocked, and is connected correctly to the small PCB near the drum motor. Check that wires have not been squeezed between the motor cover and the chassis.</p> <p>*CE version 220v Bullet only. Make sure to put back the chaff collector.</p> <p>*For CE version 220v Bullets, this error code will appear when taking off the Chaff Collector to calibrate the fan. To successfully calibrate the fan, please take the Chaff Filter out of the Chaff Collector and open the Chaff Plug. Take the Bean Chute plug and Tryer off the Bullet. Place the Chaff Collector back on to proceed a successful calibration.</p>
ErC 6864	IBTS fan RPM is too slow/stops completely.	Check that the fan is not being blocked, and is connected correctly to the IBTS PCB. It is ok if it only happens right after you plug in the power. It means the fan takes a bit longer to get up to speed. If the error shows up in any other mode, please contact us.
Err 0001	No communication with the induction module. Happens at startup. Most likely because a connector is loose on the	Remove the cover plate on the control board. Remove the 4 black screws securing the PCB

	control board. If you recently took off the front plate you might accidentally have pulled out the connector.	module. Carefully pull out the module and check that all connectors are in place. Reassemble.
Err 0002	Drum Temp too high. If you have V1.5 or V2.0 or updated to the IBTS, then if the micro fan does not start up, the firmware will revert back to the old type Drum Temp sensor with a lower temperature limit.	If using IBTS, check the connectors to the sensors. Make sure the small fan is spinning.



## Warnings

When a non-critical error (warning) is found the clock display will show “A” followed by the warning code. The induction will not be forced off and you can continue roasting..

The corresponding error codes are shown in the clock display:

Attention message	Description	What should I do
A-01	<p>Exhaust fan is locked and cannot turn.</p> <p>Since Firmware 553 this warning will also occur if the RPM for the exhaust fan is below 400 RPM</p> <p>*CE version 220v Bullet only. If the chaff collector is not installed during Cooling Mode, the power of the Exhaust Fan would be cut and trigger A-01. It could also be that the power cut protection switch has failed.</p>	<p>Take off the Chaff collector and make sure nothing is preventing the fan from turning. Calibrate your exhaust fan. See section <a href="#">Settings Menu</a></p> <p>*CE version 220v Bullet only. Make sure to put back the chaff collector.</p>
A-02	<p>“Dead man’s switch” alarm after two minutes of roasting above a bean temperature of 160 deg C, and no input from the keypads were detected</p>	<p>Press any key on the keypad and the alarm will stop.</p>
A-04	<p>Input voltage low warning</p>	<p>Make sure your cable to the R1 is as short as possible and is rated for 10A for the 220V version and 15A for the 110V version. This error can also occur if the bearing is not seated correctly in the front place, making the drum difficult to spin. If error persists then contact us.</p>
A-05	<p>Errors A-01 and A-04 at the same time.</p>	
A-08	<p>Chaff filter is blocked or an external fan is making the exhaust fan spin too quickly. When the exhaust fan cannot suck enough air it will begin to stall. This means the RPM on the fan will increase. In cooling mode on F7 setting the R1 will compare the RPM to a threshold. If it’s above this threshold it could indicate that the chaff filter is blocked.</p> <p>Another way for the RPM to be too high is if an external fan is directly connected to the R1, and it is causing too high an airflow.</p>	<p>Make sure the chaff collector filter is clean. It is possible to stop this warning by changing the fan setting to anything but F7 in cooling mode.</p>

# Specifications

- **Roast Capacity:** Maximum 1000g, Minimum 200g (fastest roasting for 1kg is 8-10min - to FC)
- **Monthly Capacity:** 100kg
- **Roast time:** 0-59min
- **Maximum temp:** Bean: Max 244°C
- **Roast Mode:** Manual, Recorded Profile
- **Temperature Sensors:** Infrared Drum and Bean Temperature Sensor & Bean Temperature Probe
- **Control Display:** Bean Temperature, Drum temperature or Bean temperature Rise °C/ min. Time
- **Heating:** 9 Steps (350W-1500W) patented direct drum induction heating
- **Fan:** 10 Steps
- **Control Panel Display:** Temp: Bean & Drum, 3 digits each. Time: 4 digits, Power & Fan 2 digits
- **Computer Interface:** USB Micro, Logging of all data. Roaster can be controlled from PC
- **Computer Software:** Available at no cost for Windows 7/8/1/11, Mac OS
- **Temperature Units:** °C or °F can be chosen
- **Protection:** Electronics over temperature. Heater over temperature protection. Fan lock protection on all fans.
- **Fault logging System:** Status is monitored on all major components.
- **Drum:** Multi vane, 5.9L solid carbon steel drum
- **Heating System:** Patent Pending, variable power direct induction heating
- **Exhaust Fan:** 78mm removable aluminum centrifugal fan for easy cleaning
- **Bean Loading:** Through funnel
- **Bean Ejection:** Manual
- **Bean Cooling Tray:** Detachable. Fan Cooling. Connected to underside of roaster
- **Chaff Collector:** Detachable. Empty every 2-3kg of roasting
- **Bullet R1 V2-220V Model / Input Voltage:** 200V-240V. 50Hz-60Hz
- **Bullet R1 V2-110V Model / Input Voltage:** 110V-127V. 50Hz-60Hz
- **Power Requirement:** 1500W
- **Operating ambient temperature:** Tested for use at room temperature (25°C)
- **Size:** L: 59cm W 31cm: H:42cm (L:75cm including bean cooler)
- **Size shipping box:** L: 66cm W 38cm: H:51cm
- **Weight:** 17.6 kg (Shipping weight 21 kg)
- **Warranty:** 2 years

**Country of origin:** Made in Taiwan, designed and engineered in Denmark.

## **This manual in other languages**

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**[Thai user manual](#)**

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