

## Device Operation and Required Specifications

### Basic Requirements:

- **Temperature Sensor (MAX6675):** The heater must shut off completely when the temperature exceeds 450°C.
  - **Weight Sensor (HX711):** Used as a safety condition during operation.
  - **Electric Door Lock:** Controlled using a relay.
  - **Induction Heater:** Controlled via a relay and operates according to the duration set from the user interface.
  - **Cooling Fans:** Operate based on a set duration, connected to a power MOSFET on a PWM pin (you choose the specific pin) for speed control.
  - **Touch Screen:** Used for system control and displaying the graphical interface.
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### Device Operation Mechanism:

Upon powering the device:

- The user interface appears with the device logo.
- If the screen is not touched within two minutes, the logo remains displayed.
- When the screen is touched, a main menu appears with three options:
  - Person
  - Clothes
  - Surrounding

When selecting one of the options, three heating options and three time options appear. Upon selection, instructions are displayed along with **Start** and **Cancel** buttons.

At the bottom center of the screen, there is also a **Safe Mode** button of the same shape and size as the others.

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## Operating Settings:

Each option has specific heat and time settings, using the following parameters to define intensity and heating duration:

Option	Parameters (X, Y, Z)
Low Heat	X = 110, Y = 25
Medium Heat	X = 120, Y = 30
High Heat	X = 130, Y = 35
Time 2.5 minutes	Z = 150
Time 5 minutes	Z = 300
Time 8 minutes	Z = 480

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## Details for Each Mode:

### 1. “Person” Mode

#### Instructions:

- Remove clothing hangers.

- Place incense in the designated compartment.

#### **Operation (Z):**

- Keep the lock closed and turn on the induction heater for X seconds.
- At second 30, unlock the door to allow the person to enter.
- **Notification:** Prompt the person to enter.
- If the scale does not detect a value  $> 0$  within 15 seconds  $\rightarrow$  heater turns off and X and Z are paused until entry.

When the person enters, the system checks weight:

- **More than 50 kg:** Operation continues.
- **Between 0 and 50 kg:**
  - Turn off the heater within 5 seconds.
  - **Notification:** Warning that the person is underage and the device will not operate.

Once weight exceeds 50 kg:

- Start fans after 10 seconds at 15% PWM.

#### **Work Cycle:**

- After X seconds, heater turns off for Y seconds.
- Heater turns on for Y seconds.
- Heater off for Y seconds, then on again for Y seconds, and the cycle repeats until Z ends.

#### **On Exit:**

- If scale reads 0 kg, turn off the heater after 5 seconds.

- Lock closes after 10 seconds.
  - Fans run for 1 minute at 80% PWM.
  - **Notification:** Cycle complete and warning not to touch the incense chamber for 10 minutes.
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## 2. “Clothes” Mode

### Instructions:

- Hang the clothes.
- Close the door.
- Fill and close the incense compartment.

### Operation (Z):

- Check weight:
  - **0 kg:** Lock closes and operation begins.
  - **Weight detected:** Unlock until weight returns to 0.

Start heating for X seconds.

### Work Cycle:

- After X seconds, heater turns off for Y seconds.
- Heater on for Y seconds.
- Heater off for Y seconds, then on again for Y seconds, and the cycle repeats until Z ends.
- Fans run from the end of X until the end of Z at 10% PWM.

### After Z ends:

- **Notification:** Prompt to collect clothes and confirm cycle completion, with a warning not to touch the incense chamber for 10 minutes.
  - Fans run for 1 minute at 80% PWM.
  - Lock closes after 10 seconds if not already closed (if weight remains 0).
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### 3. “Surrounding” Mode

#### Instructions:

- Ensure incense is placed in the compartment.

#### Operation (Z):

- Check weight:
  - **0 kg:** Operation continues.
  - **Weight detected:**
    - Heater does not operate.
    - Lock does not close.
    - **Notification:** Person detected inside.

Close the lock.

Start the heater for X seconds.

#### Work Cycle:

- After X seconds, heater turns off for Y seconds.
- Heater on for Y seconds.
- Heater off for Y seconds, then on again for Y seconds, and the cycle repeats until Z ends.

**30 seconds before Z ends:**

- Heater shuts off regardless of current cycle state.

**After Z ends:**

- Fans run for 1 minute at 80% PWM.
  - Lock closes after 10 seconds if not already closed (if weight remains 0).
  - **Notification:** Cycle complete and warning not to touch the incense chamber for 10 minutes.
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**Safe Mode:**

- Heater does not operate.
- Lock is open.
- Fans are off.
- Exit button to return to main menu.