

# PRESSURE COOKER WITH DIGITAL DISPLAY AND CONTROL

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**Abstract:** Pressure cooker is a utensil which help us to cook the food by using water and cooking liquid. Pressure cooker helps us to cook a food faster than other utensil and it consumes less energy and helps us to save LPG, Electricity and most important thing is a time. It reduces cooking efforts. In this project we are implementing such a system that continuous monitor status of cooker.

**Keyword:** - ATmega328 microcontroller, a Hall Effect sensor, magnet and pressure.

## I. Introduction

The old pressure cooker are very slow in pressure. It took a very much time to cook the food. Now a days advanced pressure cookers are available in market with a feature such as preset cook time, display temperature and display whistle count but these advanced pressure cooker are having high cost, so a common man can't afford this advanced pressure cooker. So we have implemented a system with similar feature that can be implemented on our regular pressure cooker. This system is cost effective and easy to use and implement in day to day life. So that a common man easily implement in all kitchen like home, hotel, restaurant, mess and canteen etc.

## II. Literature survey:-

This literature review focus on history and generation of pressure cooker which has been used until now.

1. In 1679, the French physicist Denis Papin, better known for his studies on steam, he invented the steam digester in an attempt to reduce the cooking time of food. His invented airtight cooker used steam pressure to raise the water's boiling point, thus food cooks much more quickly.
2. In 1681, London's scientist Papin presented his invention to the Royal Society, but the Society's members consider his invention as a scientific study.
3. In 1864, Georg Gutbrod of Stuttgart began manufacturing pressure cookers. These pressure cookers made of tinned cast iron.



Fig 1. Tinned cast iron pressure cooker

4. In 1918, Spain presented a patent for the pressure cooker to Jose Alix Martinez from Zaragoza. Patent under the name of "express cooking pot", under patent number 71143 in the Boletín Oficial de la Propiedad Industrial.
5. In 1924, the first pressure cooker recipe manual was published, written by José Alix and titled "360 formulas de cocina Para guisar con la 'olla express or 360 recipes for cooking with a pressure cooker.
6. In 1938, Alfred Vischer presented his invention, in New York City. His pressure cooker was the first one designed for home use, and its success led to competition among the countries American and European manufacturers. At the 1939 New York World's Fair, the National Pressure Cooker Company, later renamed National Presto Industries, introduced its own pressure cooker.

### First generation:

These cookers known as "old type" pressure cookers, these operate with a weight-modified or "jiggler" valve, which releases pressure during operation. Some people consider them loud because sometimes the valve rattles as excess in steam is released. Pressure cookers typically offer only one pressure level. Some newer pressure

cookers allow the operator to change the weight of the valve, thus changing the pressure.

The first-generation cookers, with the addition of new safety features such as a mechanism which prevents the cooker from being opened until it is completely depressurized.

### Second generation:

The second generation pressure cooker operate with a spring-loaded valve that is often hidden from view in a proprietary mechanism. This generation is changed by two or more pressure settings. Some of these pressure cookers do not release any steam during operation and instead of this they use a rising indicator with markings to show the pressure level. These only release steam when the pan is opened, or as a safety precaution if the heat source is not reduced enough when the pan reaches the required cooking pressure. Others use a dial that the operator can advance by a few clicks to change the pressure setting or release pressure. These release steam during operation this is also called as venting.



Fig 2. Second generation pressure cooker.

### Third generation/ Electric pressure cookers:

After the stove-top pressure cookers, in 1991-invented the electric pressure cookers, called the "third generation" pressure cookers.

These cookers include an electric heat source that is automatically regulated to maintain the operating pressure. They can also include a spring-loaded valve. This type of pressure cooker cannot be opened with a cold water quick-release method and should be operated with caution when releasing vapour through the valve, especially while cooking foamy foods and liquids such as lentils, beans, grains, milk, gravy, etc.



Fig 3. Electric pressure cooker

An electric pressure cooker with advanced features like integrates a timer.

Depending on cooking control capability, there are three generations of electric pressure cookers.

First-generation, with mechanical timer. There is no delayed cooking capability.

Second-generation, with digital controller. Delayed cooking becomes possible and the controller shows a countdown timer when working pressure is reached.

Third-generation, with smart programming, which includes pre-set cooking times and settings based on heating intensity, temperature, pressure and duration.

Survey with the help of papers:

“Automatically Controlled 2-Vessel Pressure-Cooker Test-Equipment”

- 1] K. Ogawa
- 2] J. Suzuki
- 3] K. Sano

NTT Musashino Electrical Communication Laboratory, Tokyo

In this paper design of proposed method is based on highly accelerated humidity test for plastic encapsulated IC reliability short-term evaluation. 2-Vessel pressure cooker test (PCT) equipment capable of controlling relative humidity and temperature independently and of keeping sample free from water droplet condensation, has been designed.

“Double assembly line balancing method for a manufacturing of a digital rice cooker”

- 1] Patawee Phiphatsomporn
- 2] Pisut Pongchairerks

In this paper there are three simple algorithm for assembly line balancing method. These are DLCR, DRPW and DMFT algorithm. This paper also introduce four instance generated from the real data from the manufacturer of digital rice cooker.

**III. Objectives: -**

The main objective of this project is implement a system in a low cost. This system having features like a digital pressure cooker so this pressure cooker is affordable to all common people. The main intension of this project is to save energy, time and fuel.

**Block diagram description and Working:-**

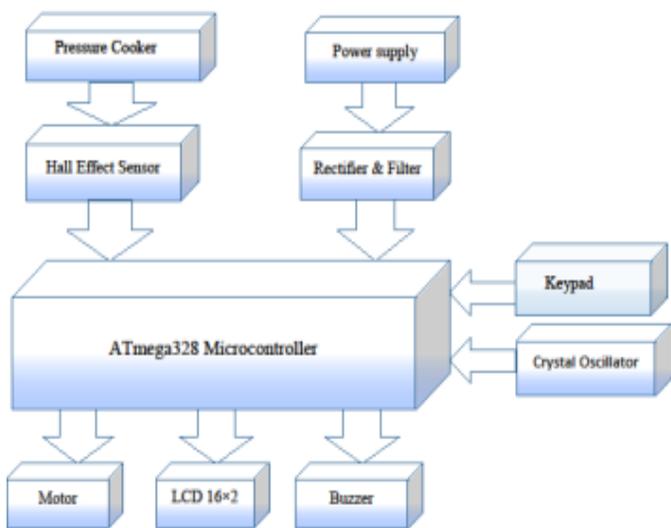


Fig. 4 block diagram of proposed system

First of all, power supply is given to the system. Then turn ON gas. Boiling process will be starts inside pressure cooker. Due to boiling whistling occurs, the whistling cause’s movement of whistle in upward direction which results in releasing steam pressure from pressure cooker. Then as per user requirement number of whistle count can be given with the help of keypad.so user can see the respective number of count on LCD display. This whistle count is stored in ATmega328 microcontroller.

Magnet is placed at the top of the whistle which generates magnetic field around it. When movement of whistle takes place Hall Effect sensor sense the presence of magnetic field. This will cause change in voltage across Hall Effect sensor. This voltage is processed by ATmega328 and count 1 is shown by LCD display. As the count reaches to 3, buzzer will blow loudly and for each whistle next onwards buzzer will blow loudly. As the required number of whistle is equal to count of whistle then gas will be automatically turn OFF with the help of motor.

**IV. Flow chart:-**

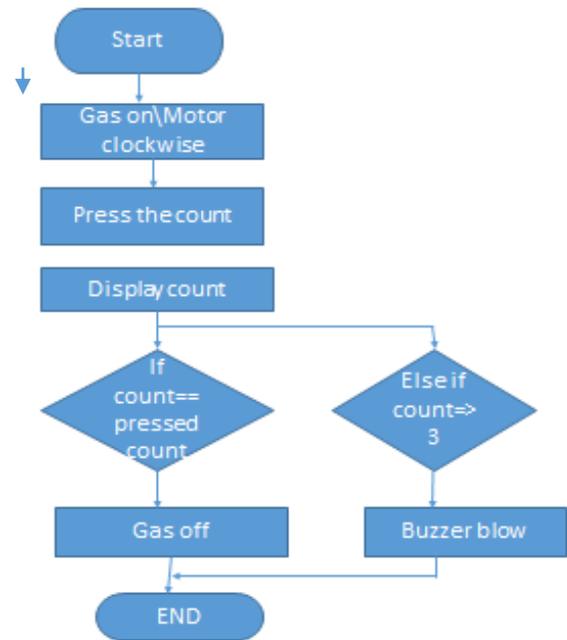


Fig. 5 Flow chart of proposed system.

**V. How effective our system**

Table-1 Comparison

Sr. No.	Parameter	Proposed System	Advanced Pressure Cooker
1)	Operating voltage	9 to 12 volts DC	240 volt AC
2)	Size	Can vary according to cooker size	Fixed size
3)	Handling	Easy to handling	Complex for handling
4)	Cost	Cost effective	Costly
5)	Operator Specialization	No special knowledge required for system operating	Special knowledge required for system operating

**Conclusion:-**

Pressure cooking is a quick and convenient way to cook healthy and delicious food. Our proposed system is easy process to counting the whistles so that the system becomes like a digital pressure cooker. In case of at the time of cooking if no one is presence in kitchen at that time announce of buzzer will aware the person indicating that the food is cooked and ready to serve. It gives accurate counting of whistles.

**Future scope:**

The system can be modified with the use of speaking voice alarm. One more modification is measuring a pressure generated inside pressure cooker and display it, also provide a buzzer to indicate a danger situation.

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