A Project Report

On

"AUTOMATIC SEED DRILL MACHINE"

By

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Under the guidance of

Prof. S.B. LAHANE

Submitted in partial fulfillment of the requirement for the degree of Bachelor of Technology (Mechanical)

Department of Mechanical Engineering
CSMSS Chh. Shahu College of Engineering, Aurangabad

Year 2022-23

CERTIFICATE

This is to certify that the project/seminar report entitled

"AUTOMATIC SEED DRILL MACHINE"

Submitted by

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B.Tech. (Mechanical)

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INDEX

LIST OF FIGURE

ABSTRACT

Aim of the project is to develop a mechanical system for sowing the seeds in agriculturelands without more efforts. The mechanical system includes two main mechanisms which are the drilling system and Seed storage and sowing mechanism. The drilling mechanism is use to prepare the soil for the sowing and further use. The drill teeth go under the soil and carve it in certain pattern to prepare it for sowing. The preparation of the soil is very important because it plays a major role in seed germination. Before the crop is grown, three major steps are carried out for the preparation of soil, namely ploughing, levelling, and manuring. The process of inserting or burning the seeds inside the soil is called sowing. Seeds should be sown at a particular depth, and proper distance or intervals should be maintained between the seeds. The seeds should be free from diseases and viable to get a high-yield crop.

INTRODUCTION

A seed drill is a device used in agriculture that sows seeds for crops by positioning them in the soil and burying them to a specific depth while being dragged by a tractor. This ensures that seeds will be distributed evenly.

The seed drill sows the seeds at the proper seeding rate and depth, ensuring that the seeds are covered by soil. This saves them from being eaten by birds and animals, or being dried up dueto exposure to the sun. With seed drill machines, seeds are distributed in rows; this allows plants to get sufficient sunlight, nutrients, and water from the soil.

Before the introduction of the seed drill, most seeds were planted by hand broadcasting, an imprecise and wasteful process with a poor distribution of seeds and low productivity. Use of a seed drill can improve the ratio of crop yield (seeds harvested per seed planted) by as much as nine times. The use of seed drill saves time and labor.

Some machines for metering out seeds for planting are called planters. The concepts evolved from ancient Chinese practice and later evolved into mechanisms that pick up seeds from a binand deposit them down a tube.

Seed drills of earlier centuries included single-tube seed drills in Sumer and multi-tube seed drills in China, and later a seed drill by Jethro Tull that was influential in the growth of farmingtechnology in recent centuries. Even for a century after Tull, hand sowing of grain remained common.

Many seed drills consist of a hopper filled with seeds arranged above a series of tubes that canbe set at selected distances from each other to allow optimum growth of the resulting plants. Seeds are spaced out using fluted paddles which rotate using a geared drive from one of the drill's land wheels. The seeding rate is altered by changing gear ratios. Most modern drills useair to convey seeds in plastic tubes from the seed hopper to the colters. This arrangement enables seed drills to be much wider than the seed hopper — as much as 12m wide in some cases. The seed is metered mechanically into an air stream created by a hydraulically powered onboard fan and conveyed initially to a distribution head which sub-divides the seeds into the pipes taking the seeds to the individual colters.

Before the operation of a conventional seed drill, hard ground has to be plowed and harrowedto soften it enough to be able to get the seeds to the right depth and make a good "seedbed",

providing the right mix of moisture, stability, space and air for seed germination and root development. The plow digs up the earth and the harrow smooths the soil and breaks up any clumps. In the case that the soil is not as compacted as to need a plow, it can also be tilled by less deeply disturbing tools, before drilling. The least interruption of soil structure and soil fauna happens when a type of drilling machine is used which is outfitted to be able to "direct drill"; "direct" referring to sowing into narrow rows opened by single teeth placed in front of every seed-dispensing tube, directly into/ between the partly composted remains (stubble) of the last crop (directly into an untilled field).

The drill must be set for the size of the seed used. After this the grain is put in the hopper on top, from which the seed grains flow down to the drill which spaces and plants the seed. This system is still used today but has been updated and modified over time in many aspects; the most visible example being very wide machines with which one farmer can plant many rows of seed at the same time.

A seed drill can be pulled across the field, depending on the type, using draft animals, like bullocks or by a power engine, usually a tractor.

Seeds sown using a seed drill are distributed evenly and placed at the correct depth in the soil.

HISTORY

While the Babylonians used primitive seed drills around 1400 BCE, the invention never reached Europe. Multi-tube iron seed drills were invented by the Chinese in the 2nd century BCE. This multi-tube seed drill has been credited with giving China an efficient food production system that allowed it to support its large population for millennia. This multi-tubeseed drill may have been introduced into Europe following contacts with China. In the Indian subcontinent, the seed drill was in widespread use among peasants by the time of the Mughal Empire in the 16th century.

The first known European seed drill was attributed to Camillo Torello and patented bythe Venetian Senate in 1566. A seed drill was described in detail by Tadeo Cavalina of Bologna in 1602. In England, the seed drill was further refined by Jethro Tull in 1701 in the Agricultural Revolution. However, seed drills of this and successive types were both expensive and unreliable, as well as fragile. Seed drills would not come into widespread use in Europe until the mid to late 19th century, when manufacturing advances such as machine tools, die forging and metal stamping allowed large scale precision manufacturing of metal parts.

Early drills were small enough to be pulled by a single horse, and many of these remained in use into the 1930s. The availability of steam, and later gasoline tractors, however, saw the development of larger and more efficient drills that allowed farmers to seed ever larger tracts in a single day.

Recent improvements to drills allow seed-drilling without prior tilling. This means that soils subject to erosion or moisture loss are protected until the seed germinates and grows enough tokeep the soil in place. This also helps prevent soil loss by avoiding erosion after tilling. The development of the press drill was one of the major innovations in pre-1900 farming technology.

Seed-counting machines can be an integral part of a seed drill.

NEED OF SEED DRILL MACHINE

In older methods of planting, a field is initially prepared with a plow to a series of linear cuts known as furrows. The field is then seeded by throwing the seeds over the field, a method known as manual broadcasting. The seeds may not be sown to the right depth nor the proper distance from one another. Seeds that land in the furrows have better protection from the elements, and natural erosion or manual raking will cover them while leaving some exposed. The result is a field planted roughly in rows, but having a large number of plants outside the furrow lanes.

There are several downsides to this approach. The most obvious is that seeds that land outside the furrows will not have the growth shown by the plants sown in the furrow since they are too shallow on the soil. Because of this, they are lost to the elements. Many of the seeds remain on the surface where they are vulnerable to being eaten by birds or carried away on the wind. Surface seeds commonly never germinate at all or germinate prematurely, only to be killed by frost.

Since the furrows represent only a portion of the field's area, and broadcasting distributes seeds fairly evenly, this results in considerable wastage of seeds. Less obvious are the effects of overseeding; all crops grow best at a certain density, which varies depending on the soil and weather conditions. Additional seeding above this will actually reduce crop yields, in spite of more plants being sown, as there will be competition among the plants for the minerals, water, and the soil available. Another reason is that the mineral resources of the soil will also deplete at a much faster rate, thereby directly affecting the growth of the plants.

CLASSIFICATION OF SEED DRILL

1. **According To Power Source**
    1. Bullock Drawn Seed Drill
    2. Tractor Drawn Seed Drill

2. **According to the type of seed metering done animal drawn seed drill.**
    1. Manually metered seed drill.
    2. Mechanically metered seed drill.

- In manually metered seed drills a person drops the seeds in furrows , in mechanicallyMetered seed drills a mechanical device called seed metering mechanism is used to meter the seeds.

- There are many design of bullock seed drills and tractor drawn seed drills which areused for sowing…

Fig. CLASSIFICATION OF SEED DRILL

COMPONENTS OF SEED DRILL

FRAME:

The frame in a seed drill is the structural framework that holds all the components of the machine together. It provides support, stability, and organization to the various elements of the seed drill. Here are some key uses and functions of the frame in a seeddrill:

Structural Support: The frame serves as the backbone of the seed drill, providing structural integrity and strength. It holds all the components in place and ensures that they remain properly aligned and functional during operation.

Component Attachment: The frame provides attachment points and mounting locations for different components of the seed drill, such as the seed box, covering device, seed tubes, metering mechanisms, and other parts. It allows for secure and precise positioning of these components, ensuring their proper functioning.

Weight Distribution: The frame helps distribute the weight of the seed drill evenly, both for stability during transport and for effective operation in the field. It ensures that the weight is distributed appropriately across the machine, preventing imbalance or excessive stress on any particular area.

Maneuverability: The frame design of a seed drill often includes features that facilitate ease of maneuverability. It may have wheels or other mechanisms for transport and navigation across the field. The frame's design considers factors such as turning radius, ground clearance, and overall maneuverability to enhance efficiency during field operations.

Operator Safety: The frame may incorporate safety features to protect the operator during use. It can provide shielding or guards to prevent contact with moving parts, rotating components, or other hazards associated with the seed drill.

Modular Design: Some seed drill frames are designed to be modular, allowing for customization and flexibility. Farmers can modify or add components to the frame based on their specific requirements, such as attaching additional seed boxes, fertilizerattachments, or other accessories.

Fig. Frame

SEED BOX

The primary uses of the hopper (or seed box) in a seed drill machine include:

Seed Storage: The hopper serves as a container for holding a large quantity of seeds. It allows farmers to load a significant amount of seeds at once, reducing the frequencyof refilling during the sowing process.

Seed Dispensation: The hopper is equipped with mechanisms to dispense the seeds from the container into the seed tubes or distribution system of the seed drill. These mechanisms regulate the flow rate of seeds, ensuring a controlled and even distributionacross the field.

Seed Protection: The hopper protects the seeds from external elements such asmoisture, dust, and pests. It helps maintain the quality and viability of the seeds until they are sown in the field.

Seed Variety Management: By utilizing a hopper, farmers can easily switch between different seed varieties. They can empty the hopper and refill it with a new type of seed,allowing for efficient sowing of different crops or seed varieties without cross- contamination.

Convenience and Efficiency: The hopper streamlines the sowing process by providing a centralized location for seed storage and dispensation. It allows for continuous operation without the need for frequent manual seed handling, saving time and effort.

Fig. Seed Box

COVERING DEVICE:

Here are some key aspects and uses of the covering device in a seed drill machine:

Soil Coverage: After the seeds are dropped or dispersed from the seed box, the covering device helps to bury them at the desired depth within the soil. It typically consists of discs, furrow openers, or other mechanisms that create a furrow or trench inthe soil and cover the seeds as the machine moves forward.

Depth Control: The covering device allows for the adjustment of the seeding depth. Farmers can set the desired depth based on the crop requirements, soil conditions, andother factors influencing seed germination. This ensures that the seeds are placed at anappropriate depth for optimal growth.

Soil Firming: In addition to covering the seeds, the covering device may include elements like press wheels or packing wheels that help in firming the soil around the seeds. This improves seed-to-soil contact, promotes moisture retention, and enhances seed germination rates.

Seed Protection: The covering device helps protect the seeds from exposure to externalfactors such as sunlight, wind, and birds. By burying the seeds in the soil, it reduces therisk of seed damage or predation, improving the chances of successful germination andestablishment.

Uniform Seed Placement: The covering device ensures that the seeds are covered uniformly across the entire sowing width. It helps maintain consistent seed spacing anddistribution, leading to even crop emergence and reduced competition among plants.

Fig. COVERING DEVICE

TRANSPORT WHEEL :

The transport wheel in a seed drill machine is a specialized wheel or set of wheels thatare primarily used for transporting the machine from one location to another, such as between fields or to storage. It is designed to provide easy mobility and maneuverabilityduring transportation. Here are some key uses and functions of the transport wheel:

Mobility: The transport wheel allows for convenient movement of the seed drill machine. It enables farmers or operators to easily transport the machine from one fieldto another, reducing the need for additional equipment or vehicles for relocation.

Maneuverability: The design of the transport wheel ensures smooth navigation and maneuverability, even on uneven or rough terrains. It enables the operator to steer and control the direction of the seed drill machine during transportation, making it easier tonavigate tight spaces or obstacles.

Weight Distribution: The transport wheel, along with other wheels or axles on the seed drill, helps distribute the weight of the machine evenly. This balanced weight distribution ensures stability and prevents excessive stress on any specific area, reducing the risk of damage during transportation.

Ground Clearance: The transport wheel is typically designed to provide sufficient ground clearance. It helps prevent the seed drill machine from getting stuck or damagedwhen moving over uneven surfaces, such as bumps, rocks, or furrows in the field.

Transport Lock: Some seed drill machines feature a transport lock mechanismassociated with the transport wheel. This mechanism allows the operator to secure the wheels in a fixed position, preventing them from rotating or pivoting during transportation. It enhances stability and reduces the risk of accidental movement.

Storage Convenience: The transport wheel makes it easier to store the seed drill machine when not in use. By enabling smooth movement, it allows operators to position the machine in a designated storage area or shed without much effort.

Fig. Transportation Wheel

DRILLER

The driller in a seed drill machine is a critical component responsible for creating furrows or channels in the soil where the seeds are sown. It plays a key role in preparing the seedbed and facilitating precise seed placement. Here are some important aspects and uses of the driller in a seed drill machine:

Furrow Creation: The driller consists of blades or discs that cut through the soil, creating furrows or channels. These furrows provide a designated space for the seeds to be deposited, ensuring proper seed-to-soil contact.

Depth Control: The driller allows for the adjustment of the seeding depth. Farmers can set the desired depth based on crop requirements, soil conditions, and other factors influencing seed germination. This control ensures that the seeds are placed at the optimal depth for successful establishment.

Furrow Opening: The driller not only cuts through the soil but also helps in opening and widening the furrow. This action ensures that there is enough space for the seeds to be sown without getting crowded or buried too deep.

Precision and Uniformity: The driller ensures precise seed placement and uniformity of seed distribution. It helps maintain consistent seed spacing and depth across the sowing width, promoting even crop emergence and minimizing competition among plants.

Seed Protection: By creating furrows, the driller helps protect the seeds from being exposed on the soil surface. It reduces the risk of seed predation by birds, wind dispersal, or other factors that may hamper seed germination.

Soil Management: The driller can contribute to soil management practices. Some seed drill machines are equipped with additional features such as coulters or tines attached to the driller. These components may help with soil cutting, residue management, or seedbed preparation, ensuring optimal conditions for seed placement.

Operational Efficiency: The driller enables efficient and continuous sowing operations. It allows for a controlled and consistent flow of seeds, minimizing seed wastage and optimizing the use of seed resources.

Fig. Driller

SEED METERING MECHANISM

The mechanism which pick up seed box and delivers them in to the seed tube is called seed metering mechanism. or the mechanism of seed drill or fertilizer distributor which deliver seeds or fertilizers from the hopper at selected rates is called seed metering mechanism.

Seed metering mechanism may be several types

I) Fluted feed type

II) Internal double run type

III) Cell feed mechanism

IV) Brush feed mechanism

V) Augur feed mechanism.

VI) Picker wheel mechanism.

VII) Star wheel mechanism

FLUTED FEED TYPE

It is a seed meeting devices with adjustable fluted roller to collect and deliver the seeds into the seed tube. Fluted feed type mechanism consists of a fluted feed wheel , feedroller , feed cut-off and adjustable gate for different sizes of grains.

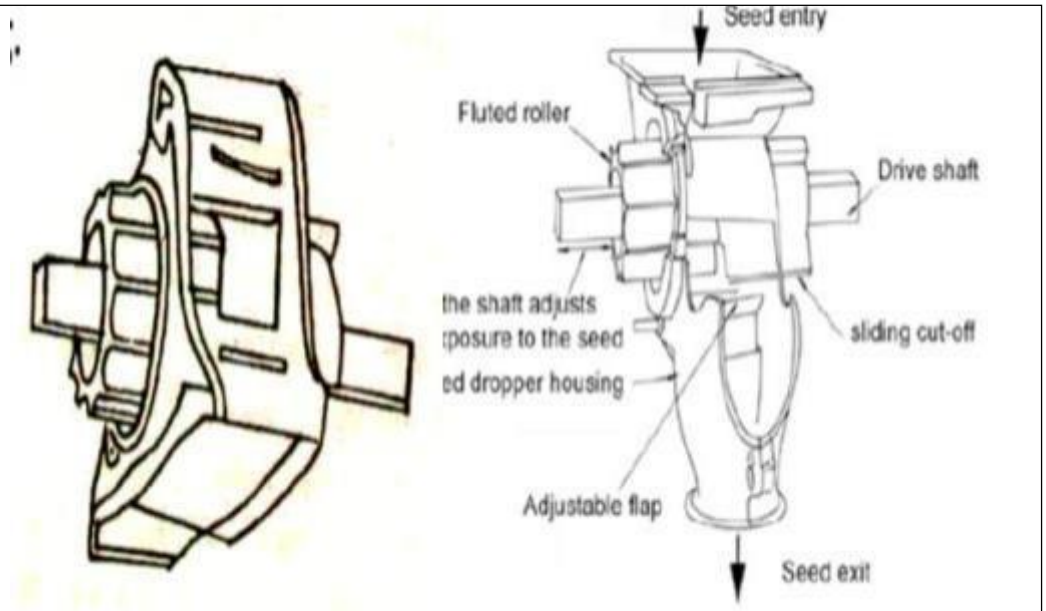
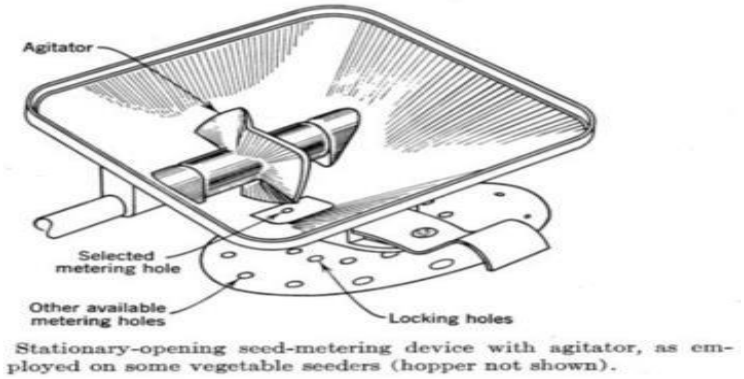


Fig. FLUTED FEED TYPE

INTERNAL DOUBLE RUN TYPE



Stationary-opening seed-metering device with agitator, as employed on some vegetable seeders (hopper not shown).

Fig. INTERNAL DOUBLE RUN TYPE

CUP FEED MECHANISM

It is the mechanism that consist of cups of spoons and the periphery of a vertical rotating discwhich pics up the seeds from the hopper and delivers them into the seed tubes.it consists of a seed hopper which has two parts , the upper one is called gain box and the lower one is calledfeed box.

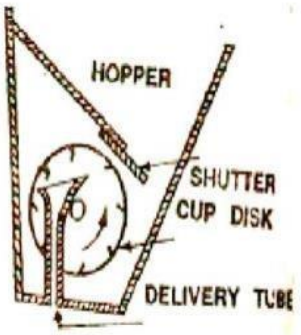


Fig. Cup Feed Mechanism

CELL FEED MECHANISM

It is a mechanism in which seeds are collected and delivered by a series of equally spacedcells on the periphery of a circular plate or wheel.

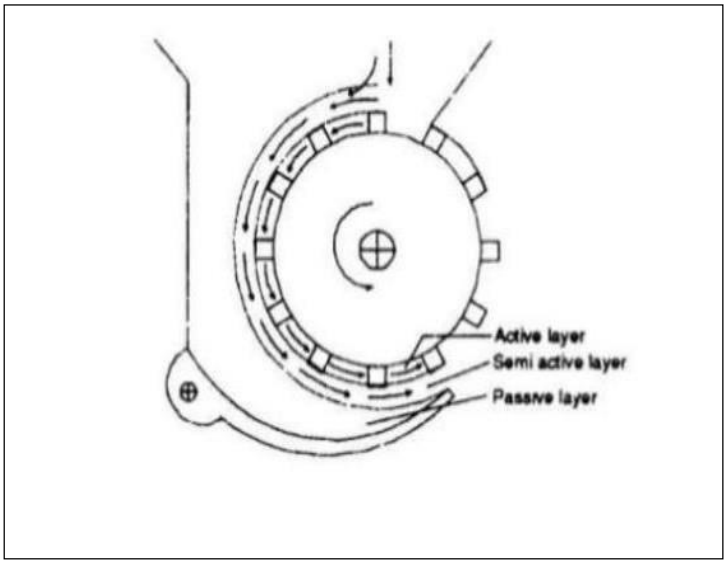


Fig. CELL FEED MECHANISM

BRUSH FEED MECHANISM:

It is a mechanism in which a rotating brush regulates the flow of seed from the hopper. thefollowing is diagram of brush feed mechanism

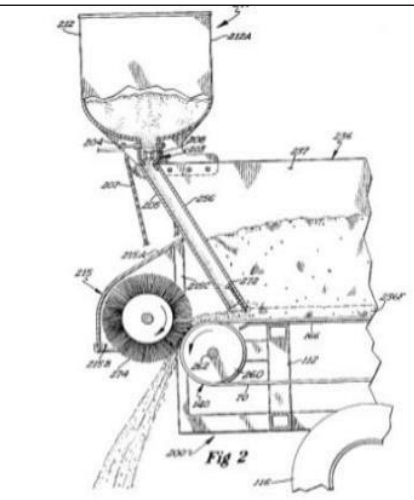


Fig. BRUSH FEED MECHANISM:

AUGUR FEED MECHANISM:

It is a distributing mechanism consisting of an auger which causes a substance to flow evenlyin the field through an aperture at the base or on the side of hopper.

PICKER WHEEL MECHANISM:

It is a mechanism in which vertical plate is provided with radially projected arms which dropthe large seeds like potato in furrows with the help of suitable jaws.

ELECTRONIC COMPONENTS AND SENSORS

E18-D80NK

An infrared sensor is an electronic module that is used to detect the certain physical appearance of its surroundings by either emitting and/or detecting infrared radiation. IR sensors can also sense motion and determine the amount of heat released by an object. These sensors are commonly used in intruder alarms, light switches, and other home automation and industrial automation applications. We have previously used IR sensors in many projects. But these IR sensors can't be put in sunlight as the sun also releases IR waves. There is only one common solution for this problem: Modulate your IR signal so that your sensor can detect an IR variation rather than a fixed IR level.

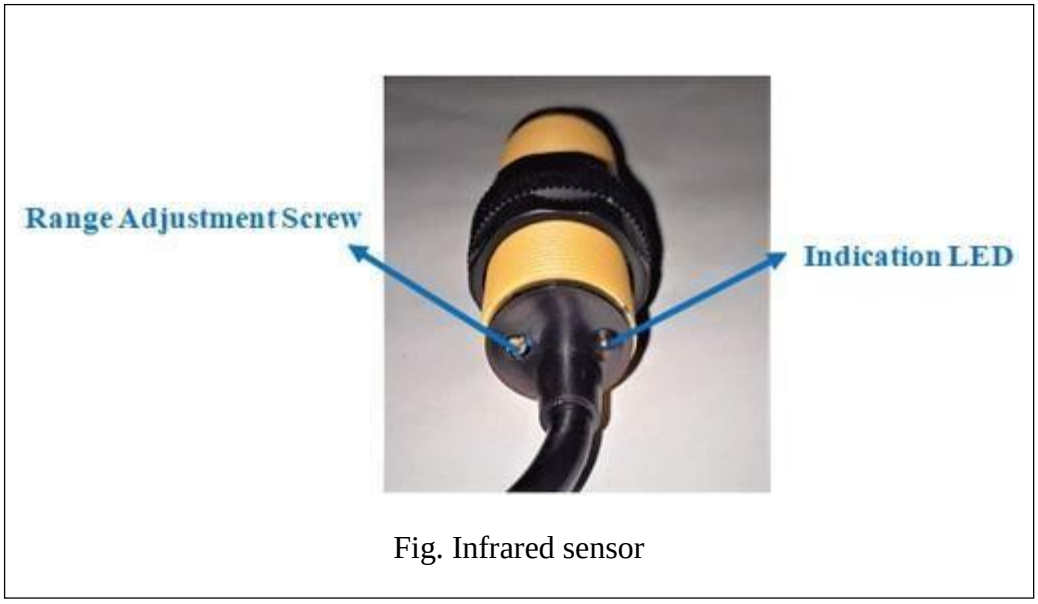


Fig. Infrared sensor

In this tutorial, we are going to interface E18-D80NK IR Proximity Sensor with Arduino. The E18-D80NK is an advanced low-cost IR Proximity Sensor with an obstacle detection range of 3 cm to 80 cm. The use of modulated IR signal protects the sensor from the interferences caused by the normal light of a light bulb or the sunlight.

E18-D80NK IR Obstacle Avoidance Proximity Sensor

E18-D80NK Infrared Obstacle Avoidance Sensor is a low-cost IR Proximity Sensor with an adjustable range of 3 cm to 80 cm. The E18-D80 sensor comes with IR Transmitter and IR receiver in one module. The IR transmitter transmits modulated IR signal, which is then reflectedby the object in its path and then detected by the receiver. This sensor has less interference by sunlight because of the modulated IR light.

Fig. Infrared Obstacle Avoidance Sensor

E18-D80 IR Sensor is widely used in robots to avoid obstacles, industrial assembly lines, Reverse Car Parking, and many other automation applications. The detection range can be adjusted according to the application using the multi-turn screw that is located at the back of the sensor. The switching signal output changes according to the obstacle detection. It remains high when no obstacles and changes to low when there are obstacles. A red LED is placed behind the probe that turns high whenever an obstacle is detected. The E18 sensor operates on 5V and consumes around5mA to 30mA current without any load.

E18-D80NK IR Proximity Sensor Specifications & Features:

- Input voltage: 5V DC
- Current consumption: > 25mA (min) ~ 100mA (max)
- Dimension: 1.7cm (diameter) x 4.5cm (length)
- Cable length: 45cm
- Detection of objects: Transparent or Opaque
- Diffuse reflective type
- Sensing range: 3cm to 80cm (depends on obstacle surface)
- NPN output (normally high)
- Environment temperature: -25 °C ~ 55 °C

Dual Channel Relay Module

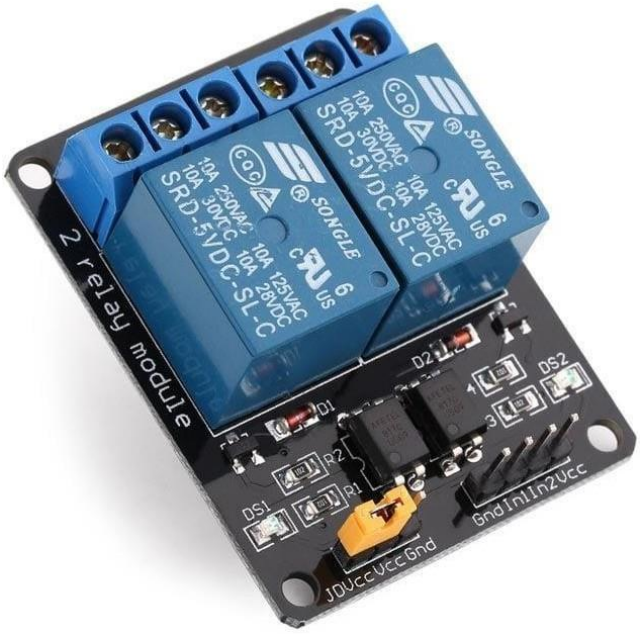


Fig. Dual Relay Module

This is a 2 Channel isolated 5V 10A relay module Optocoupler for Arduino PIC ARM. It can be used to control various appliances and other types of equipment with a large current. It canbe controlled directly with 3.3V or 5V logic signals from a microcontroller (Arduino, 8051, AVR,PIC, DSP, ARM, ARM, MSP430, TTL logic).

This relay has a 1×4 (2.54mm pitch) pin header for connecting power (5V and 0V), and forcontrolling the 2 relays.

The pins are marked on the PCB as:

GND – Connect 0V to this pin.

IN1 – Controls relay 1, active Low Relay will turn on when this input goes below about 2.0V IN2 – Controls relay 2, active Low Relay will turn on when this input goes below about 2.0VVCC – Connect 5V to this pin. Is used to power the optocouplers About
high level and low level-triggered mode:
High-level trigger refers to the signal voltage between input and trigger, can be understood as a signal input with VCC cathode short-circuit triggered a way;

Low-level trigger refers to the signal voltage between the input terminal and Earth OV trigger, can be understood as the signal input terminal and the GND negative electrode short circuit triggered away 1-channel relay module connection

Jumper Instruction = The relay can be turned on when we connect 5v to one end and the other to -5v / Gnd, while talking about the jumper, if we short the VCC and the middle pin, then our relay will act as high level-triggered relay means that when we will apply + 5V input on its input pin it will be turned on and when the jumper will be set to “middle and GND”, it will act as a low-leveltriggered relay, It means that relay will be triggered when we implement the 5V / GND on its inputpin.

Specification

Relay Type **Logic Input (V)**	Low Level Trigger 3.3 ~ 5
Trigger Voltage (VDC) **Switching Voltage (VAC)**	5 250@10A
Switching Voltage (VDC)	30@10A

LM2596S DC-DC Buck Converter Power Supply

Fig DC-DC Buck Converter Power Supply

DC-DC Buck Converter Step Down Module LM2596 Power Supply is a step-down(buck)switching regulator, capable of driving a 3-A load with excellent line and load regulation. These devices are available in fixed output voltages of 3.3 V, 5 V, 12 V, and an adjustable output version.

The LM2596 series operates at a switching frequency of 150kHz, thus allowing smaller sized filtercomponents than what would be required with lower frequency switching regulators.

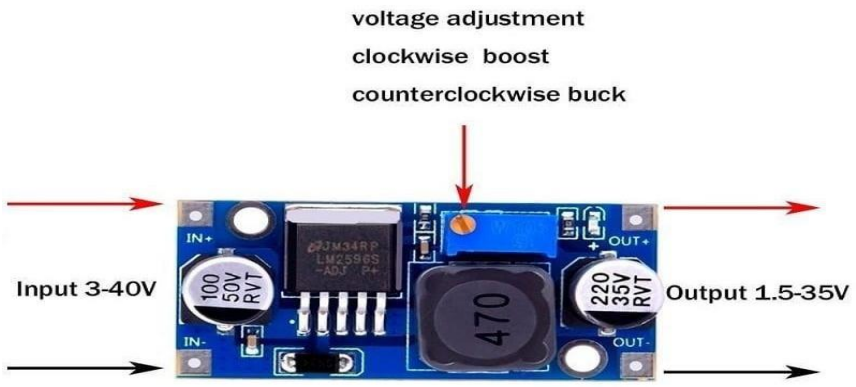


Fig. LM2596 DC-DC buck converter

This is an LM2596 DC-DC buck converter step-down power module with the high-precision potentiometer, capable of driving a load up to 3A with high efficiency, which can work with Freeduino UNO, other mainboards, and basic modules. When the output current keeps greater than2.5A (or output power greater than 10W), please add a heat sink to it.

This device is internally compensated to minimize the number of external components to simplifythe power supply design.

Since LM2596 converter is a switch-mode power supply, its efficiency is significantly higher in comparison with popular three-terminal linear regulators, especially with higher input voltages. The LM2596 operates at a switching frequency of 150 kHz thus allowing smaller sized filter components than what would be needed with lower frequency switching regulators.

Specification

Input voltage Output voltage	3-40V 1.5-35V(Adjustable)
Output current Switching Frequency	Rated current is 2A, maximum 3A(Additional heatsink is required) 150KHz
Operating temperature Conversion efficiency	Industrial grade (-40 to +85) 92%(highest)
Load Regulation Voltage Regulation	± 0.5% ± 0.5%
Dynamic Response speed	5% 200uS

NMC 18650 2500mAh (8c) Lithium-Ion Battery

Fig. 18650 2500mAh (8c) Lithium-Ion Battery

BAK NMC 18650 2500mAh (8c) Lithium-Ion Battery is a single cell compact and powerful batterycell with 2500mAh capacity. It is very convenient to install in your project where 3.6 Volt with high capacity is needed.

Features:

High energy density

High working voltage for single battery cells.Pollution-

free

Long cycle life No memory

effect

Capacity, resistance, Voltage, platform time consistency is good.Good

consistency and low self-discharge.

Lightweight, small size Shape:

Cylindrical Battery

Battery Type: Lithium-Ion Battery

High performance and capacity Flattop to suit
many devices fitting.

Specifications:

Nominal capacity: 2500 mA h @ 0.2C, By standard charge / discharge Minimum

capacity: 2400 mA h @ 0.2C, By standard charge / dischargeNominal voltage:

3.6V

Charge voltage: 4.2V Discharge cut-off

voltage: 2.5V

Rated charge current: 4A（25℃）

Max continuous discharge current: 20A（25℃）

Operating Temperature (Cell surface): 0~50℃ （Charge ＜45℃, -20℃~75℃ （Discharge ＜ 50℃

Humidity range: 0 ~ 60 % RH (non-condensing) Internal

resistance: ≤ 16 mΩ (AC Impedance, 1000 Hz)Battery dimension

Height: 65.10 mm Max ：65.10 mm Diameter:

18.6 0mm Max : 18.60mmWeight: ≤ 48g

AC/DC12V 22mm AD16-22DS LED Power Pilot Signal Indicator Lamp

Fig. AD16-22DS LED

Avoid conventional color bulbs to monitor a phase/line signal, and replace them with these new powerful LED Power Pilot Signal Light Lamp with various advantages over the old bulbs. This New pilot lamp uses LEDs as a light source which is energy-saving, small and compact, and

extremely durable which adds a systematic and classy look to your control dashboard or signal monitoring spot on any device or chassis.

The cover of this pilot indicator is made of PC plastic to provide good shock resistance and can beused as an indication for pilot lights, accident signals, or other power availability check signals in the circuits of telecommunication and electrical apparatus ***Features:***

1. **Easy** for installation
2. Good environmental Protections
3. Very low Power consumption
4. Durable PC material and Fitting screw to lock on the dashboard
5. Available in various sizes, colors, and voltage rating

Specification

Operating Voltage(V)	AC/DC 12V-48V
Current Consumption (mA)	20mA
Body Material	Plastic
Color	Red,Green

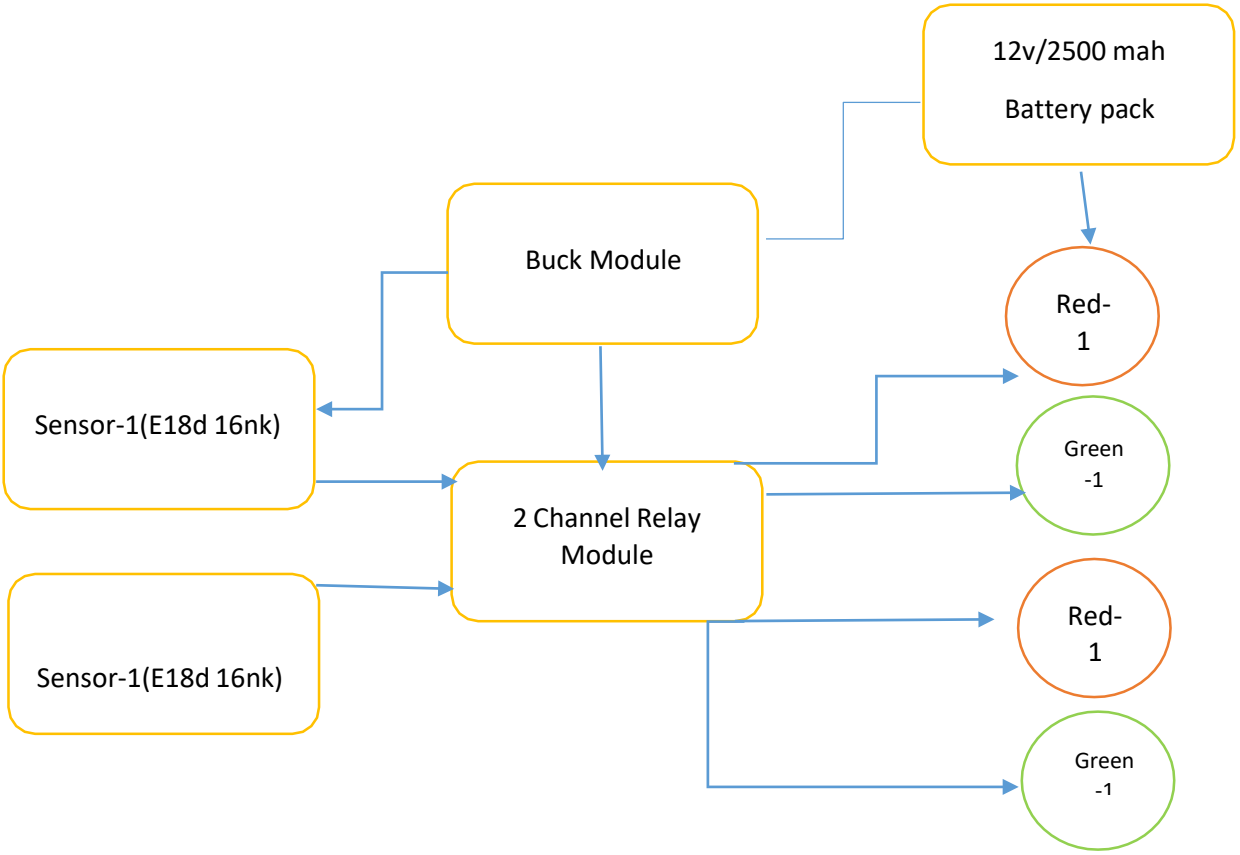
Sewing Machine Motor with Regulator (50 Watts, Black)

Fig. Sewing Machine Motor with Regulator (50 Watts, Black)

Specification

Manufacturer	Brother
Item Weight	1 kg 860 g
Item Dimensions LxWxH	10 x 6 x 6 Centimeters
Net Quantity	1.00 count
Included Components	1 Motor, 1 Regulator, 1 Belt, 1 Base, 1 Pair of Carbon Brush
Generic Name	Parts & Accessories
Best Sellers Rank	#441,378 in Home & Kitchen (See Top 100 in Home & Kitchen) #814 in Sewing & Embroidery Machines

BLOCK DIAGRAM



IMPACT

The invention of the seed drill dramatically improved germination. The seed drill employed a series of runners spaced at the same distance as the plowed furrows. These runners, or drills, opened the furrow to a uniform depth before the seed was dropped. Behind the drills were a series of presses, metal discs which cut down the sides of the trench into which the seedshad been planted, covering them over.

This innovation permitted farmers to have precise control over the depth at which seeds were planted. This greater measure of control meant that fewer seeds germinated early or late and that seeds were able to take optimum advantage of available soil moisture in a prepared seedbed. The result was that farmers were able to use less seed and at the same time experience larger yields than under the broadcast methods.

The seed drill allows farmers to sow seeds in well-spaced rows at specific depths at a specific seed rate; each tube creates a hole of a specific depth, drops in one or more seeds, and covers it over. This invention gives farmers much greater control over the depth that the seed is planted and the ability to cover the seeds without back-tracking. The result is an increased rate of germination, and a much-improved crop yield (up to eight times).

The use of a seed drill also facilitates weed control. Broadcast seeding results in a random array of growing crops, making it difficult to control weeds using any method other than hand weeding. A field planted using a seed drill is much more uniform, typically in rows,allowing weeding with a hoe during the growing season. Weeding by hand is laborious and inefficient. Poor weeding reduces crop yield, so this benefit is extremely significant.

CONCLUSION

In a seed automatic drill machine is a valuable agricultural tool that revolutionizes the process of seed sowing. It offers several benefits and features that contribute to efficient and precise seed placement, improved crop emergence, and overall farming productivity.

With its seed box (hopper), the machine provides ample seed storage capacity, minimizing the need for frequent refilling. The seed metering mechanisms ensure controlled and uniform seed distribution, optimizing seed usage and reducing wastage. The covering device, often equipped with furrow openers or discs, creates furrows in the soil and covers the seeds at the desired depth, promoting proper seed-to-soil contactand protecting the seeds from external elements.

The frame of the seed drill machine provides structural support, component attachment points, weight distribution, and maneuverability. It enables easy transport between fields and ensures the stability and durability of the machine during operation.

Additional components such as the transport wheels facilitate convenient movement and storage of the machine, while the driller plays a crucial role in creating furrows and ensuring accurate seed placement. Overall, a seed automatic drill machine streamlines the sowing process, reduces labor requirements, and increases efficiency in agriculture. It allows farmers to sow seeds with precision, achieve uniform crop emergence, and optimize the use of seeds, ultimately leading to improved crop yields and higher agricultural productivity.s