

# ***ELECTRIC DRILLS***



## ***A Brief History Of Electric Drills.***



In 1889 an inventor named Arthur James Arnot developed & patented the Electric Drill in Melbourne. Just 6 years later in 1895 the first hand held portable electric drill was developed by the German brothers Wilhelm & Carl Fein in Stuttgart. The Fein brothers continued to develop their drill and by 1900 were incorporating aluminium components as a weight saving measure.

By 1917, Black & Decker had patented a trigger-like switch, which was mounted on a pistol-grip handle to turn the portable electric drill on & off, this style is still commonplace today.

## ***Types Of Electric Drills.***

There are a number of types and sizes of electric drills, many designed and manufactured for special purposes. Pneumatic and hammer drills for example are used for drilling hard material including concrete and rock. Special purpose electric drills are used as screwdrivers, engineers drills are often specifically designed for drilling steel and angle drills are made to allow drilling in confined spaces.

## ***Frequently Asked Electric Drill Questions.***

### ***Why Do I Need To Change The Speed Of The Drill?***

The ideal speed of a drill bit depends upon the size of the bit and the material being drilled. Larger bits need to turn more slowly than smaller bits otherwise they may overheat and damage their cutting edge. Single speed drills (2000/2500rpm) are available and they are usually purchased for a specific task. Drills are also available that offer fixed speeds, generally two, the slower speed is usually about 500 rpm less than the fast speed. The switch between speeds can be electronic or mechanical (by changing the gearbox ratio). The next step up is to a variable speed drill where the speed is infinitely variable up to a pre-set limit. The speed is usually controlled by a trigger, the further the trigger is depressed, the faster the speed of the drill. Some electric drills have an adjustable trigger stop that can be set so that the drill speed is maintained at a speed suitable for the job in hand. Most variable drills provide a high torque, slow-start; this enables a hole to be started carefully reducing the risk of the bit slipping and damaging the work. Its worth remembering that long periods of use at low speeds should be interspersed by bursts of high-speed running in order to keep the motor cool. This is because the drill's fan runs at the same speed as the motor, so when the motor slows down so does the fan. Some variable speeds drills

have two (or more) speed ranges (such as 0 to 1100 and 0 to 3000 rpm). A separate switch on the body of the drill switches between ranges.

### ***What Is The Difference Between A Keyless And Keyed Chuck?***

Traditional drill chucks need a key (chuck wrench) to open and close their jaws to fit or remove the drill bits or attachments. With the keyless chuck, drill bits and other attachments can be fitted or removed without using a tool. Keyless chucks are often preferred as only for this reason - you will not be forever searching for the lost chuck key!

### ***What Is An SDS Chuck?***

Mostly designed for masonry work, SDS chucks use drill bits specially made for the chuck. These chucks are often used by rotary pneumatic hammer drills (see below) because they can withstand the extra forces applied by these tools. SDS chucks use a drill bit with a grooved shaft that fits and locks into the chuck. Adapters are available that allow you to connect a keyed or keyless chuck to a drill designed to use SDS bits.

### ***What's The Difference Between A Percussion Hammer Drill And A Rotary Pneumatic Hammer Drill?***

The percussion hammer action moves the drill chuck rapidly in and out through 2 opposing toothed cams that rotate against each other. This action is noisy and far less effective than rotary pneumatic drills. Rotary pneumatic drills have a piston and anvil, the piston compresses air against the anvil and this results in the hammer action. This is many times more effective than the percussion method and has in the past been far more expensive. There are now many excellent rotary pneumatic hammer drills available that do not have the high price tag.

### ***What Is A Depth Stop?***

Some electric drills are supplied with a drill depth stop this is usually an adjustable rod that attaches to the drill that stops the drill bit drilling further into the work than is required.



### ***How Does Chuck Size Compare With The Drill Size?***

Drills are broadly categorised by chuck size, we may for instance refer to a 1/4 inch, 1/2 inch, or 3/8 inch drill. The chuck size refers to the diameter of the bit that can be inserted into the chuck, stating the obvious then a 13mm chuck will accept bits with a shaft diameter of up to 13mm. There is a direct relationship between the size of the chuck and the size of the drill's motor – the larger the chuck size the larger the drills motor with very few exceptions. We have observed that in most cases motor and chuck sizes tend to fall within the following ranges; 1/4 inch (6mm) around 230/240 Watts, 3/8 inch (10mm) within 350/500 Watts and 1/2 inch (13mm) between 700/1000 Watts.

### ***Can All Drills Be Used As A Screwdriver?***

In a word yes! There are a few features that make a drill much easier to use as a screwdriver. Firstly, a variable speed trigger action allows the operator to slowly start and stop the screwing process. Secondly, a reverse gear instantly doubles the drills usefulness as a screwdriver and thirdly, torque control allows the operator to match the torque, or screwing power, to the job that is being done.