

FEED DRILLS DRIVE MANUFACTURING PRODUCTIVITY WITH AUTOMATED PRECISION, CONSISTENCY AND VERSATILITY

Today's fast paced and increasingly competitive manufacturing environments demand versatile and affordable tools that deliver repeatable precision. Manufacturers with production hole drilling and tapping operations need tools that are reliable, easy-to-use and simple to maintain. When production needs change, these tools need to be flexible to accommodate modified setups. Automated feed drills bring these qualities, and more, to diverse manufacturing operations.



Saving time and labor costs is important to all manufacturers, particularly small and general industry shops, where feed drills are a great fit. These shops need tools that offer a small footprint and are reliable and durable. Programmable feed drills offer the ability to customize machining processes with the specific speed and torque needed for a company's particular applications and materials, while providing quality control without variables. The last thing a manufacturing shop needs is lost productivity.

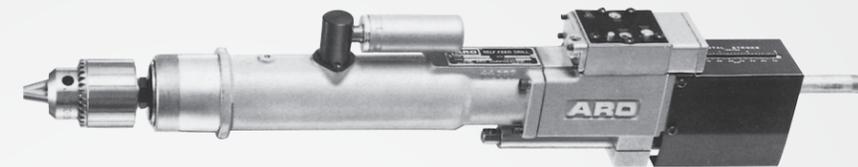
Feed drills are known for their reliability. They automate manufacturing processes that would otherwise be manual, streamlining assemblies and providing greater precision, accuracy and consistency. Pneumatic feed drills and tappers, such as those manufactured by Ingersoll Rand®, a global leader in reliable and innovative power tools, are effective and economical for a myriad of manufacturing challenges, such as plastic molding, metal die casting and woodworking. The applications range from: drilling rivet holes and wing frame mounting holes for aerospace, to drilling panel and frame holes for appliances, drilling dowel holes for furniture and drilling wood and metal parts for doors and windows.



Setting up an auto feed drill

The setup for an auto feed drill is usually a straight forward operation. The procedure begins by measuring the distance between the drill point and the work piece. The next step is adjusting a mounting bracket on the hydraulic check to where the distance between the hydraulic check plunger and the trip bracket is less than the distance between the drill point and work piece. This will ensure the drill point does not crash into the work piece. After the mounting bracket is adjusted, the feed rate is adjusted by rotating the extended spindle on the hydraulic check until the slot on the spindle is midway between the highest and lowest settings. The tool is then started, advancing at a rapid rate, until the trip bracket contacts the plunger of the hydraulic check. Finally, the hydraulic feed control is slowly rotated clockwise toward the Zero ("0") on the nameplate until the tool advances at the desired rate.

The drill operator will set the feed rate of the drill based on the materials used for the application, such as mild or hard steel, aluminum, wood, plastics, fiberglass or other materials. The hole size will determine what horsepower is required, while hole depth determines the length of drill stroke needed. Blind hole



drilling, or thru hole drilling, determines stroke length.

Hole tapping is a common application for feed drills. Tapping is the process of cutting threads into a hole to accommodate the thread pitch and the diameter of the screw, accounting for the number of threads per inch. There are currently two threading types: U.S. and Metric. The differences lie not in just inch versus metric measurements, but also in how the thread pitch is defined. In the U.S. system, thread pitch is defined as the number of threads per inch (TPI). In the metric system, thread pitch is defined as the distance from one thread to the next.

Manufacturing application setups

A simple example application for a feed drill is an operator loading parts, such as a window frame, into a jig. A setup then actuates a two-hand anti-tie down so that both buttons must be actuated concurrently. This will help the operator's hands stay out of harm's way.

The manufacturer can set up auto feed drills at multiple stations. It's not uncommon

for a small to medium shop to have up to 15 feed drills running within an assembly plant, as these drills are built for production environments that require quality manufacturing. Two feed drills can be set up to drill into opposing ends of a part and automatically drill multiple holes at the same time. Or, they can be set up on an indexing table that rotates the parts into fixed drill positions.

As an alternative, a feed drill equipped with a multi-spindle head can also drill multiple holes at one time. Multi-spindle heads come in two different styles: adjustable and fixed patterns. The adjustable heads can change to support different hole patterns within the capabilities of the particular head. Adjustable spindles come in two, three and four spindle models. Fixed spindle heads are built to match a manufacturer's specific drill patterns.

Drills can be remotely operated for continuous operations with consistency. Automated controls can be added so that operators can start, retract, stop and cycle the unit using a series of valves that can be located within the units or external to the unit. Feed drills can be programmed with an actuator, hand lever, foot pedal,

or by using the material as the actuator. The timing and other parameters are programmed with software. An actuator can be programmed to drive a feed drill to perform a sequence of multiple operations, such as coarse drilling, fine drilling and tapping.

Ingersoll Rand feed drill products

ARO®, a brand of Ingersoll Rand, has a diverse line of Bant-A-Matic, Par-A-Matic, Super-Par-Matic clutch-type and High-Thrust Series pneumatic feed drills for both manual and remote operations for drilling, reaming, counter sinking, counter drilling and tapping for diverse materials.

ARO fixtured automatic feed drills are the perfect solution when accurate and repeatable hole-drilling and tapping is needed. Depending upon the process requirements and plant power sources, manufacturers can choose from fixed pneumatic self-feed drills and tappers that have a wide range of spindles, controls and mounting accessories.

ARO offers a broad product range with the performance and precision required to automate a wide array of secondary machining applications simply and economically. The Bant-A-Matic, Par-A-Matic and Super-Par-A-Matic Series product lines provide the selection, performance and degree of precision to automate a wide range of secondary machining applications simply and economically. Reliable rotary-vane air motors offer high power-to-size performance which

Feed drills are available in many configurations, including:

- Multiple spindle drills
- Offset drills
- Tappers
- Lead screw tappers

Several accessories can be added to the drills, including:

- Multi-spindles
- Flange brackets
- Foot brackets
- Split-block clamps
- Nose housings
- Drill brushing adapters
- Hydraulic checks
- Valves and controls
- Service kits



minimizes tool size and weight for added machine design flexibility. The tools are easy-to-install and require only simple pneumatic circuitry.

The ARO High-Thrust 8670 Series automatic feed drills are designed for increased material removal rates of standard alloys and non-ferrous materials. Their high power and thrust enable the machining of even the most demanding materials, including titanium and high-nickel alloys. ARO Hi-Thrust drills feature a dual piston which develops the

increased thrust 500 pounds for fast penetration and reduced cycle times. The drills are fully automatic, with all cycle and motor functions regulated by a single control module.

For more information about Ingersoll Rand feed drills visit irtools.com/feeddrills.

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