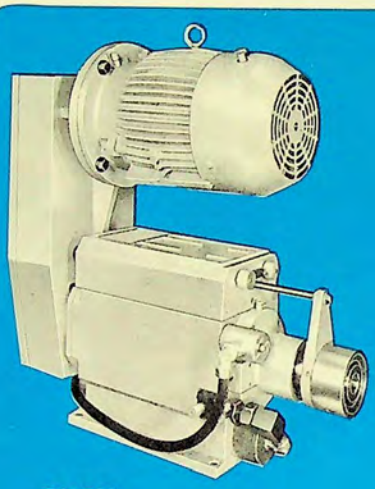
Baldwin Hall

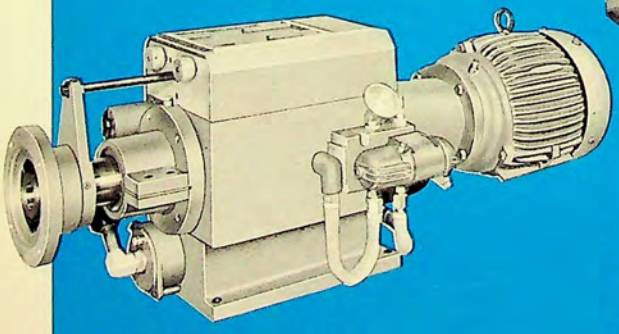
Ettco

DU-500 AUTOMATIC DRILL UNITS & MACHINES

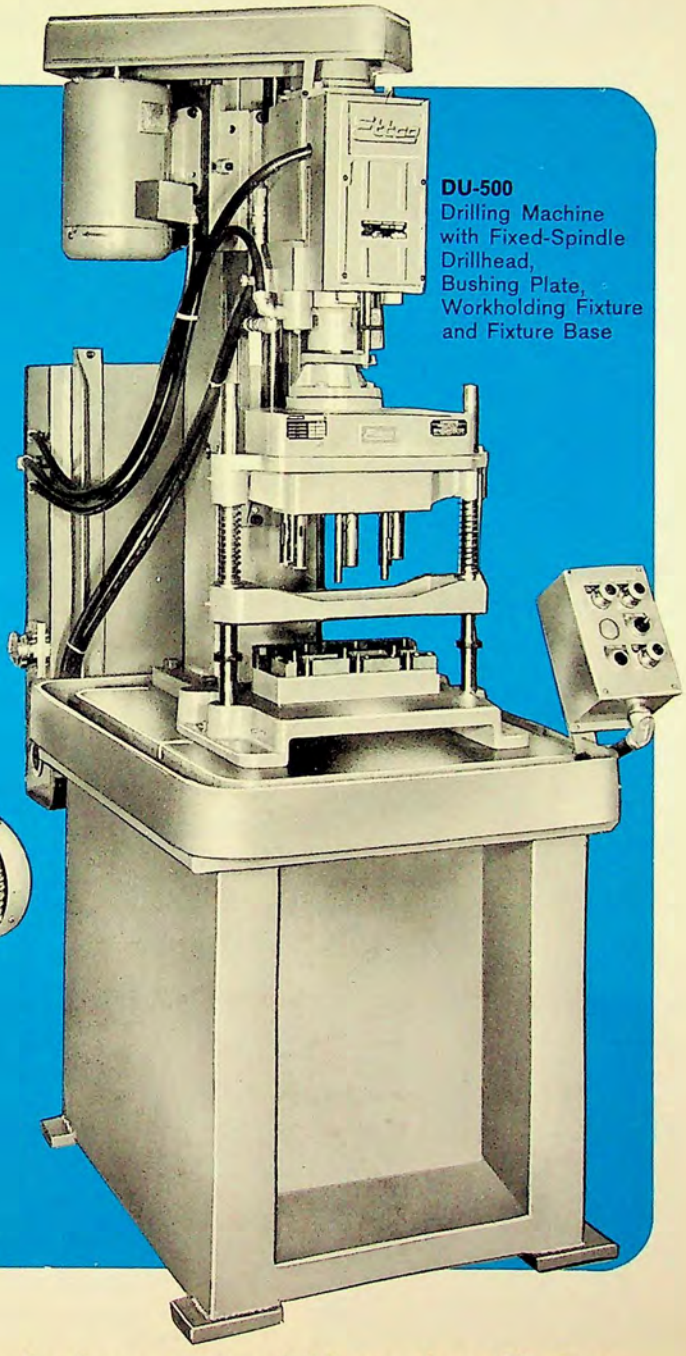
Air-Hydraulic & Full-Hydraulic



DU-500
Drilling Unit with
Overhead Motor and
Gear Drive



DU-500
Drilling Unit with
Direct Drive



DU-500
Drilling Machine
with Fixed-Spindle
Drillhead,
Bushing Plate,
Workholding Fixture
and Fixture Base

.... for drilling, reaming, counterboring, countersinking and spotfacing

DU-500 AUTOMATIC DRILL UNITS

HYDRAULIC and AIR-HYDRAULIC

The DU-500 is a quill-type automatic drill unit whose clean, simple design and quality construction throughout assure exceptionally reliable operation and long, trouble-free service life. Spindle, quill and piston are in-line. Drive spindle is mounted in sealed, pre-lubricated, double-row bearings; the 2⅜" diameter quill is supported at both ends by extra-long bearings. All steel parts are of heat-treated, chrome-moly steel; the housing is of cast aluminum alloy. Electrical components are built to J.I.C. standards.

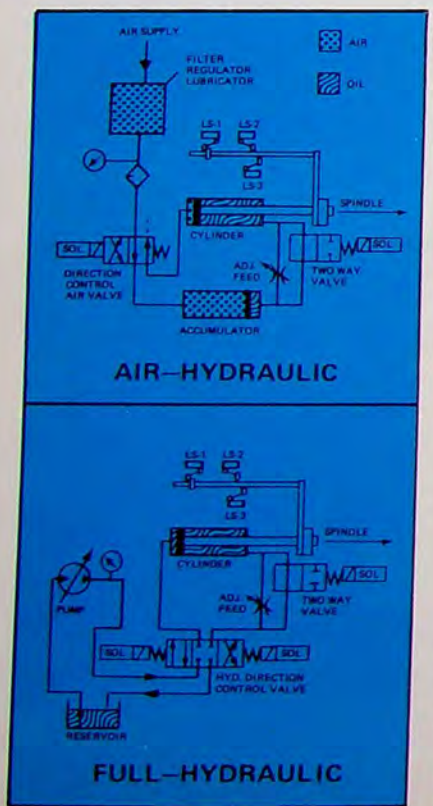
The DU-500 is flexible and versatile. It may be used in any position, at any angle. It may be arranged for push-button or fully-automatic operation and its electrical controls permit interlocking with other units. Available as optional equipment are foot switch, double-palm cycle start buttons, automatic cycle switch and timer, dwell control and timer, timed reciprocating cycle, and skip feed. Available with either direct drive or overhead-mounted motors, the DU-500 lends itself ideally to incorporation into special machines.

SPECIFICATIONS

	Air-Hydraulic	Full-Hydraulic*
Capacity: in mild steel, @ 4-ipm feed	One ⅞" drill	One 1½" drill
Thrust	1500 lbs. @ 100-psi	4500 lbs. @ 300-psi
Rapid Advance & Retract	100 ipm @ 100-psi	180 ipm @ 12-gpm
Maximum Spindle Torque	2100 inch-lbs.	
Feed Rate	Fully adjustable, 0 to 40 ipm	
Length of Stroke	4" or 6"+	
Depth Control: Standard	To within 0.005"	
With Optional Dwell Control	To within 0.0005"	

	Air-Hydraulic & Full-Hydraulic*
Motors	220/440-volt, 3-phase, 60-cycle, totally-enclosed fan-cooled; "C" face or foot mount; 3, 5 or 7½ HP; 1140 or 1725 RPM.
Drive Spindle	Standard ASA 1¼" diameter keyed hole for standard #2 or #3 Morse taper adjustable adapter. Flanged type quill is available for use with multiple-spindle heads.
Types of Drive for Unit	Direct; overhead motor mount with pulley and belt; or overhead motor mount with gear drive.
Mounting	In any position; ¾" locating keyway; flanged base for hold-down.

* Hydraulic tank and pump are external
\+ Available on overhead pulley drive unit, and on drilling machine only.



METHOD of OPERATION

The DU-500 is a quill-type air-hydraulic or full-hydraulic drill unit incorporating a 5" diameter steel cylinder, an aluminum piston, and electrical cycling controls. Rapid advance and retraction of the spindle are by means of shop air in the air-hydraulic model, and by means of pressurized oil from an external source* in the full-hydraulic model. Feed rate in both models is controlled by an adjustable feed flow control valve.

In the start position, the piston is to the rear of the cylinder, which is filled with oil. When the start button is pressed, a relay actuates the directional control valve causing pressurized air (or oil) to enter the rear of the cylinder. The piston moves forward rapidly, pushing the oil through a normally-open two-way hydraulic valve. In the air-hydraulic model the oil flows into a hydraulic accumulator; in the full-hydraulic model it flows into the reservoir.

As the spindle begins its forward motion, safety switch LS-1 disconnects the start switch so that it is removed from the circuit; this switch may also be used to interlock two or more units.

At the end of the rapid advance portion of the stroke, microswitch LS-2 is actuated, energizing a solenoid which closes the two-way hydraulic valve. The exhaust oil now flows through the adjustable feed flow control valve, and the piston and spindle then advance at the predetermined feed rate until forward limit switch LS-3 is reached.

Spindle Retraction — Air-Hydraulic

At the end of the stroke, the normally closed forward limit switch LS-3 opens, causing the hydraulic two-way valve to open and the directional control air valve to reverse; air now flows in the rear of the hydraulic accumulator, and oil is forced through the wide-open two-way hydraulic valve back into the front of the cylinder, returning the piston and spindle to start position. Upon contact, limit switch LS-1 closes the circuit for the next cycle.

Spindle Retraction — Full-Hydraulic

At the end of the drilling stroke, the normally-closed limit switch LS-3 opens, reversing the directional control valve and the two-way hydraulic valve. Oil is then pumped into the front end of the cylinder and exhausted from the rear of the cylinder into the reservoir, causing the piston and spindle to retract rapidly to the start position. Upon contact, limit switch LS-1 de-energizes the reverse solenoid in the directional control valve, returning the valve to neutral position.

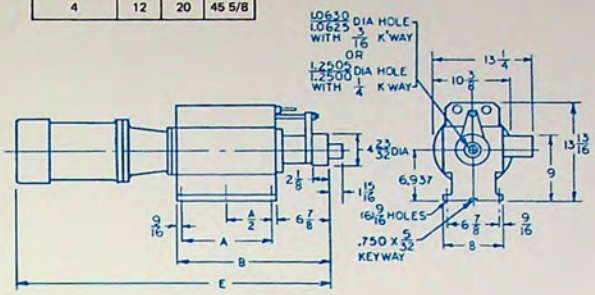
An emergency reverse button on both air-hydraulic and full-hydraulic models de-energizes the relays at any portion of the stroke, causing the piston and spindle to return rapidly to start position.

* Hydraulic pumping system, including pump, motor, tank and all necessary fittings and tubing can be provided with full-hydraulic units and machines.

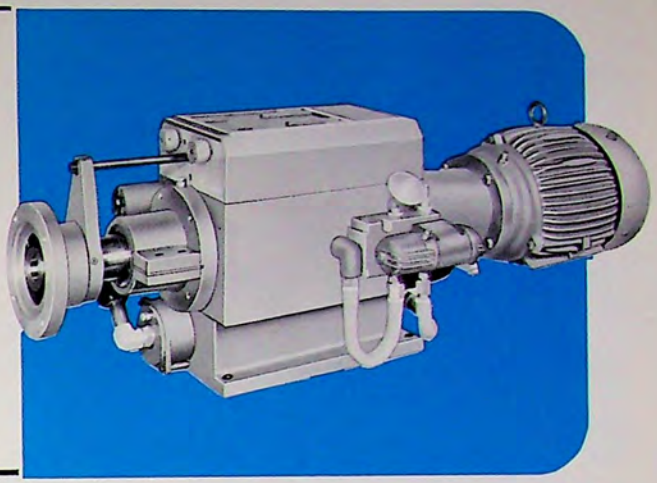
DU-500 DRILL UNIT DIMENSIONS

DIRECT DRIVE

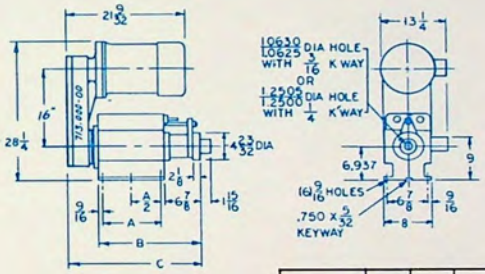
STROKE	A	B	E
4	12	20	45 5/8



Spindle Speeds:
1140 or 1725 rpm

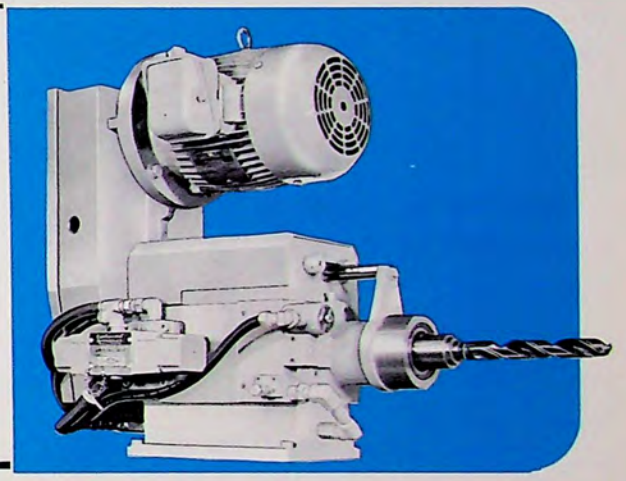


GEAR DRIVE

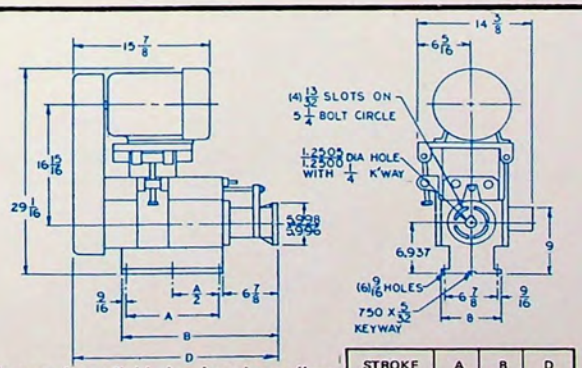


STROKE	A	B	C
4	12	20	25 7/8

Spindle speeds available by changing gears:
33 to 2930 rpm with 1140-rpm motor

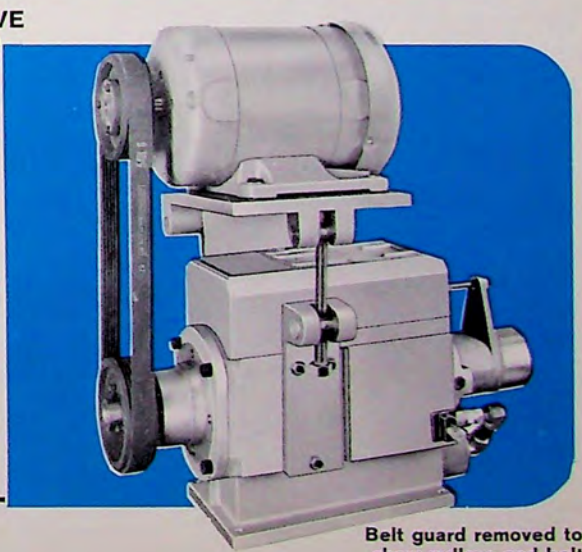


PULLEY DRIVE



STROKE	A	B	D
4	12	20	26
6	16	24	31⅛

Spindle speeds available by changing pulleys:
515 to 2480-rpm with 1140-rpm motor
780 to 3450-rpm with 1725-rpm motor
Higher speeds can be furnished on request.

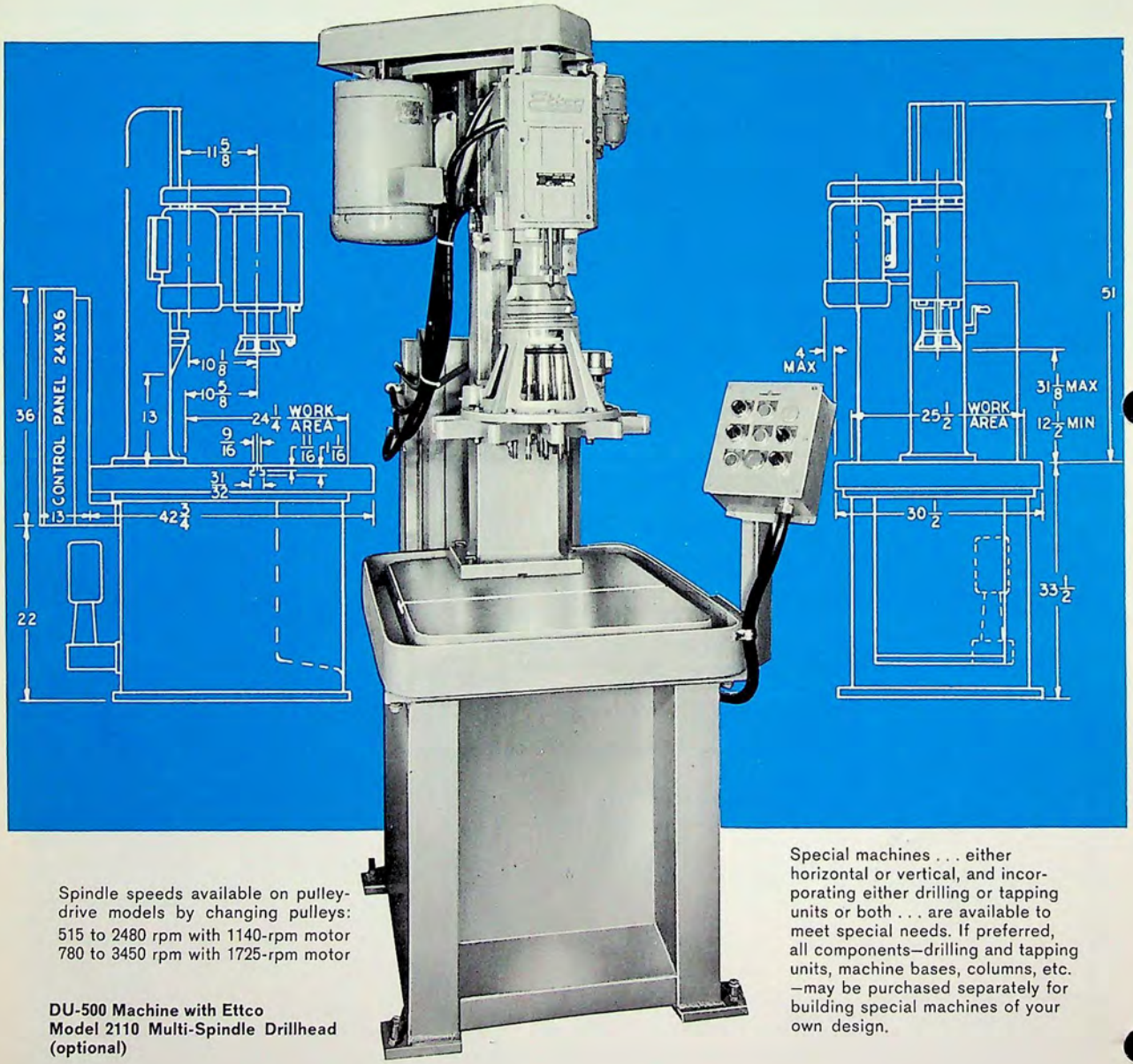


Belt guard removed to
show pulleys and belt

DU-500 AUTOMATIC DRILLING MACHINE

The DU-500 drilling machine consists of the DU-500 automatic drill unit mounted on a heavy, ribbed cast iron table with welded steel base by means of a sturdy, cast iron box column with raising and lowering mechanism. The machine incorporates all the features and characteristics of the DU-500 into a rugged, high-production vertical drilling machine. It may be used for single-spindle operation, with push-button or automatic cycling controls; with the addition of a multi-spindle drillhead, it converts quickly into an efficient, low-cost multiple-spindle drilling machine.

Electrical controls are to JIC standards. The coolant tank, pump and piping are integral parts of the machine. The oversize worktable facilitates use of high-production fixturing. Standard belt drive permits a wide range of spindle speeds by changing pulleys.



Spindle speeds available on pulley-drive models by changing pulleys:
515 to 2480 rpm with 1140-rpm motor
780 to 3450 rpm with 1725-rpm motor

DU-500 Machine with Ettco Model 2110 Multi-Spindle Drillhead (optional)

Special machines . . . either horizontal or vertical, and incorporating either drilling or tapping units or both . . . are available to meet special needs. If preferred, all components—drilling and tapping units, machine bases, columns, etc. —may be purchased separately for building special machines of your own design.

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Printed in U.S.A.