

SUPERIOR ELECTRIC NEDERLAND B.V.

slo-syn[®]

NC DRILLING MACHINE & NC DRILLING/DIGITIZING MACHINES



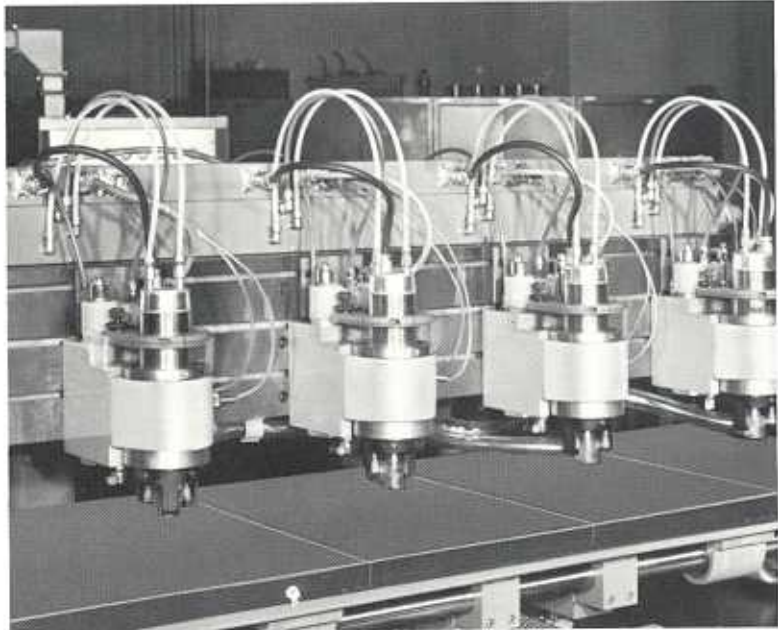
- Models with digitizing capability available with 3 or 4 drilling heads; drilling only model has 4 heads.
- Inch and metric models available
- Heavy duty, high speed, liquid cooled spindles
- High capacity chip removal system
- Precision digitizing of undimensioned artwork or prototype eliminates manually writing and typing programs
- Numerically controlled drilling, to 150 cycles per minute
- Visual display of program block and table position
- Automatic target centering in grid mode
- Controls for manual positioning, program back-up and mirror imaging
- Abbreviated tape format for fast output and efficient storage

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DRILLING ...

The SLO-SYN NC Drilling Machine is the basic unit for both drilling and drilling/digitizing models. It is designed and built for dependable and accurate drilling of printed circuit boards at high production rates. The complete assembly includes a SLO-SYN NCP numerical control, a SLO-SYN multiple station precision positioning table and variable frequency, liquid cooled, high speed spindle system.

Standard tooling plates are provided or, if desired, user tooling plates will be mounted and aligned before shipment at no charge. The tooling plates are constructed of aluminum 25.4mm x 311mm x 483mm (1 x 12¼ x 19 inches).



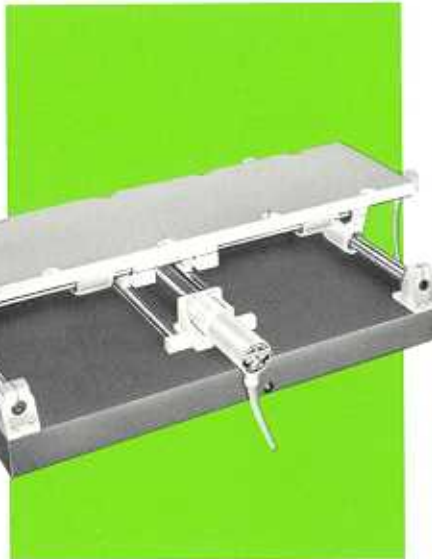
SNC1218DX-4, SNC1218DMX-4



SNC1218DIGX



NUMERICAL CONTROL: Machine control is provided by a point-to-point SLO-SYN Numerical Control. Its enclosed photoelectric tape reader accepts standard 25.4mm (1 inch) wide, 8-channel punched tape. EIA, ASCII or ISO codes can be used. Reading speed is up to 120 characters per second. Precision SLO-SYN stepping motors are used for position control.



PRECISION MULTIPLE STATION POSITIONING TABLE: Provides ample 305mm x 457mm (12 x 18 inches) of travel at each working station. Precision ball-nut lead screws are directly driven by SLO-SYN stepping motors. Guide and support are through ball and roller bushings. All bearing points are prelubricated and loaded at a fraction of their rated capacity. The table assembly is supported by a cast steel base plate on a heavy welded frame.



HIGH SPEED SPINDLE SYSTEM: Operates in a 5,400 to 54,000 rpm range with drill sizes from No. 80 to 3.18mm (1/8 inch) in a quick-change Precise Uni-Chuck collet. The use of a solid-state, high frequency converter eliminates brush and commutator wear. The liquid cooling system eliminates overheating in both the motor and the high speed ball bearings. Chips are collected from each pressure foot into a large bin through an air-driven vacuum unit.

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DRILLING / DIGITIZING ...



18D16MX-4

SLO-SYN NC Drilling/Digitizing Machines are basic drilling machines with digitizing systems added. The digitizer permits the unit to function as a precision coordinatograph. The tooling plate beneath the projection viewer is 25.4mm x 476mm x 483mm (1 x 18¾ x 19 inches).

OPERATION . . . The artwork, undimensioned drawing, photomaster, or prototype printed circuit board is placed on a simple fixture beneath the digitizer optics. The magnified image is projected on the viewing screen. The operator moves the artwork in x and y directions by means of position control buttons to center the hole positions in the crosshairs. Three positioning rates and various grid sizes can be selected. As each hole is located, depression of the DIGITIZE button will enter into buffer the coordinate data of the direction and number of steps that each axis has taken to reach the hole. The buffer, in turn, addresses the teletype until the

command is completed. The abbreviated incremental command format reduces digitizing time and tape length by more than 50 percent.

It is immaterial whether the board artwork is gridded or undimensioned or whether the artwork is distorted because of faulty screening. Holes can always be centered in pads.

After all the holes are located and programmed on tape, the machine is used to drill the boards. Short or prototype runs can be digitized and drilled at the same time. Repetitive subroutines like DIP lead patterns can be punched once and repeated at any part of the program by the teletypewriter tape reader.

This versatile package permits preparation of tape programs for any 2-axis SLO-SYN NC Positioning System. It can also be used to verify the accuracy of programs that have been prepared for these systems by using the magnifying viewer for rapid NC inspection applications.



PROJECTION VIEWER: The illuminated magnifying projector viewer provides a 10X enlarged image of details with excellent optical quality without parallax error. The viewer has sufficient intensity to permit programming in room ambient lighting.



DIGITIZER POSITION CONTROL STATION: The digitizer position control station is a compact, manually operated control box with a magnetic base for convenient placement. When the MODE switch is in the "Normal" position, the positioning table operates from the numerical tape control; when in "Digitize" position, the table operates from the digitizer position control station. The four position control buttons move the table in the direction desired. The GRID SELECT switch permits the table to stop at a multiple of the grid desired: 25 motor steps, 50 motor steps, 100 motor steps or 200 motor steps.



TAPE TELETYPEWRITER: The tape teletypewriter has an 8-channel paper tape punch, a typewriter page printer, full alpha-numeric keyboard and a tape reader. It prints at 10 characters per second as an output for a digitizer or in a local mode for manual programming. With suitable interface, it can communicate with a remote time-shared computer. The keyboard permits operator printout of title or description with the punch off, to enter special commands on the tape, and to make subroutine tapes. The tape reader is used for both verification and editing. It accepts tape loops for subroutine entry.

SLO-SYN® N C DRILLING MACHINE & N C DRILLING /DIGITIZING MACHINES SPECIFICATIONS

NUMERICAL CONTROL

Data Input	Punched paper tape, ASCII coded, tab sequential, incremental, or manual dial with index and jog.
Display	Block number, Absolute X and Y position in digitizing model.
Control Output	Power to drive SLO-SYN motors. Actuation and interlock of spindle system.

SPINDLE SYSTEM

Working Speed Range	5,400 to 54,000 rpm.
Cooling	Liquid.
Protection	Electronic.
Collet	Precise Uni-Chuck 3,18mm (1/8 inch) drills only.
Drilled Hole Range	No. 80 (0.0135 inch dia.) to 3,18mm (1/8 inch) dia.; 6,35mm (1/4 inch) dia. with P collet.
Rapid Rate	3048mm (120 inches) per minute at 80 to 100 psi.
Feed Rate	0-100% of rapid rate.

TABLE

INCH MODELS

SNC1218DX-4
SNC1218DIGX-3
SNC1218DIGX-4

METRIC MODELS

SNC1218DMX-4
SNC1218DIGMX-3
SNC1218DIGMX-4

Lead Screw	0.2 inch (5.08mm) per rev., pre-loaded ball.	4mm (0.158 inch) per rev. lead, pre-loaded ball.
Table Travel	12 x 18 inches (305mm x 457mm)	305mm x 457mm (12 x 18 inches).
Positioning Resolution	0.001 inch (0.025mm)	0.01mm (0.0004 inch).
Table Accuracy	±0.005 inch (0.13mm) optional ±0.001 inch per foot (±0.025mm per 0.31 meters)	±0.01mm per 0.12 meters (±0.0004 inch per 4.7 inches)
Table Repeatability	within 0.0005 inch (0.013mm)	Within 0.01mm (0.0004 inch).
Table Dimensions	Top size: 1270mm x 356mm (50 x 14 inches) height from base surface; 153mm (6 inches).	
Positioning Elements	Ways: Closed ball bushings on 38mm (1 1/2 inches) diameter ground steel rods. Drive: Direct coupled SLO-SYN motors.	
Load Limits	Vertical Top Force: Not to exceed 45 kg (100 lbs.) at any one point or 227 kg (500 lbs.) evenly distributed over the entire table top area. Fixture and Workpieces: 68 kg (150 lbs.) evenly distributed over the entire table top area.	

TYPES

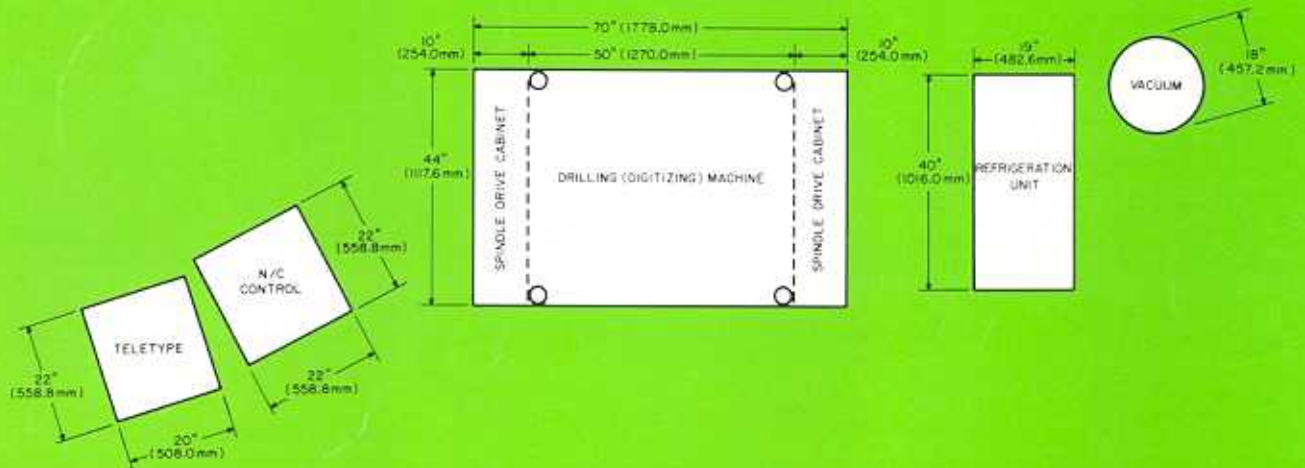
SNC1218DX-4, SNC1218DMX-4:
Includes numerical control, table and 4-head spindle system.

SNC1218DIGX-3, SNC1218DIGMX-3:
Includes numerical control, table, 3-head spindle system and digitizing system.

SNC1218DIGX-4, SNC1218DIGMX-4:
Includes numerical control, table, 4-head spindle system and digitizing system.

DIGITIZING SYSTEM

Position Control	Remote box with position control buttons and grid selector dial.
Position Display	X, Y and block number in numerical control.
Target Resolution	10X viewer with 152mm (6 inch) dia screen.
Data Input	Punched paper tape and printout at 10 cps on ASR33 teletypewriter.



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The right to make engineering refinements on all products is reserved. Dimensions and other details are subject to change. When dimensions are critical, detailed drawings should be obtained from the factory.



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