E-BEAM SWEEP

INSTRUCTION MANUAL
Version 3.0

NILES ELECTRONICS

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E-BEAM SWEEP

SPECIFICATIONS

- Output current: Dual Channel (longitudinal and lateral): ± 1.5 Amp, maximum, into a load with impedance less than 10 Ω
- Output voltage: ± 15 V peak into coils with impedance greater than 10 Ω.
- Frequency range:
  4 to 100 Hz (standard)
  1 to 25 Hz (upon request)
- Wave Output Forms:
  a. Saw-Tooth (one-dimensional shape)
  b. Sinusoidal (one-dimensional shape)
  c. Modulated and phase-locked (Circle or Spiral shape)

The Saw-Tooth and Sinusoidal waveform outputs cover a rectangular Sweep area. The Spiral covers a full round Sweep area. The Circle covers the perimeter of a circle but not the center. The output current can be adjusted by both Longitudinal and Lateral Amplitude Variable Resistors.

OPTIONS

The following options are available with the Sweep module:

- Remote Handheld Control with a Joystick. This device is useful for evaporations that need to be monitored closely.
- Four-Extra-Pattern Handheld Remote Control, which includes Programmable Logic Control (PLC). This device allows the user to create and store 4 additional patterns. The running patterns can be selected either manually on the Remote Control Unit, or from a PLC connected to the Sweep Module.

Each Optional Handheld Control is used by attachment to a ribbon cable, which is attached to the Sweep Module rear panel at the other end. Since only one Remote Control can be used at a time, their attachment to the ribbon cable were designed to be interchangeable.

FUNCTIONS

On the left of the front panel is the Power ON/OFF switch. Next to the Power switch are three switches with the following functions:

- Local/Remote toggle switch: used to determine whether the Sweep will be operated directly from the front panel or from a Remote Handheld Control.
- Pattern/Circle 3-position switch: The upper position chooses Sweep patterns. The lower position chooses a circle or spiral sweep. The center position chooses no sweep. *SEE WARNING
- Regular/Spiral toggle switch: This switch is only used when the above switch is set to "Circle". "Regular" sets the sweep pattern to circle while the "Spiral" setting is self explanatory

***WARNING**

When the beam is not sweeping, the power intensity at the material to be evaporated is very high and may cause mishaps.

In the middle of the front panel are the Lateral and Longitudinal Controls. The layout for both the Lateral and the Longitudinal Controls is as follows (A picture of the Longitudinal Controls is not included as the layout of the controls is identical to that of the Lateral Controls):

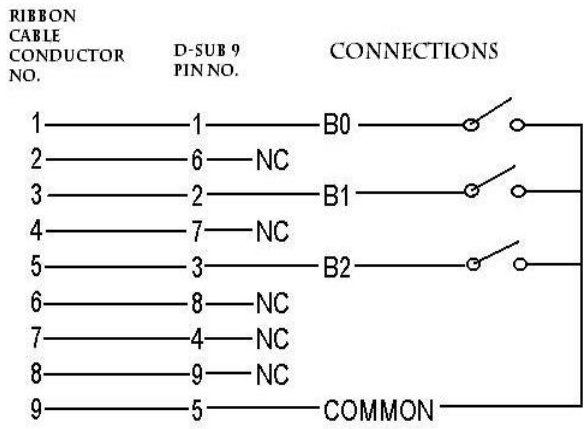
- Toggle switch: to select the desired output waveform
- Amplitude: to adjust the output current
- Position: to define the placement of the beam
- Frequency: to define the sweep frequency
    - ❖ When set to “Circle” and “Regular”, the Lateral Frequency Variable Resistor determines the regular circle frequency, while the Lateral Frequency Variable Resistor has no function.
    - ❖ When set to “Circle” and “Spiral”, the Lateral Frequency determines the angular frequency while the Longitudinal Frequency determines the spiral in and out speed. In order to see a spiral, the Longitudinal Frequency should be much lower than that of the Lateral’s. Setting the Longitudinal Frequency to be higher than the Lateral Frequency will not harm the machine, but will produce a non-typical sweep pattern that some customers may actually prefer.
- LED Display Bar: indicates the Position and Amplitude settings

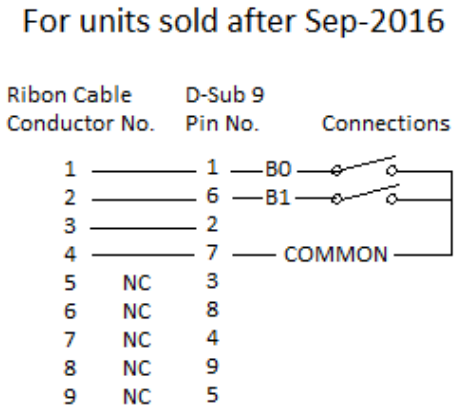
INSTALLATION

At the back panel of the Sweep Module, the connections to be made are clearly labeled. The following connections need to be made:
Connect the Philmore 3-pin Male Connector on the E-Beam Gun Coils' 3-conductor Cable to the Philmore 3-pin Female Connector on the Rear Panel.
Connect with Handheld Remote Control: applicable if a Remote Control is being used.
PLC Connection (See Chart Below)
Power:
US: 120V (accepts 100-120V) –1.5 Amp Slow Blow Fuse
240V (accepts 200-240V) –0.75 Amp Slow Blow Fuse
Europe: 220V (accepts 200-240V) – T750 mAL Fuse
NOTE: Do not select 100V, 220V on the Voltage selection board.

PLC CONNECTION CHART

(Only needed when using the Four-Extra Pattern Remote Control Unit, with the PLC setting selected on the Remote Unit.)





B_2	B_1	B_0	PATTERN NO.
X	0	0	0
X	0	1	1
X	1	0	2
X	1	1	3

KEY:
1 = Switch Closed
0 = Switch Opened
X = Disregard

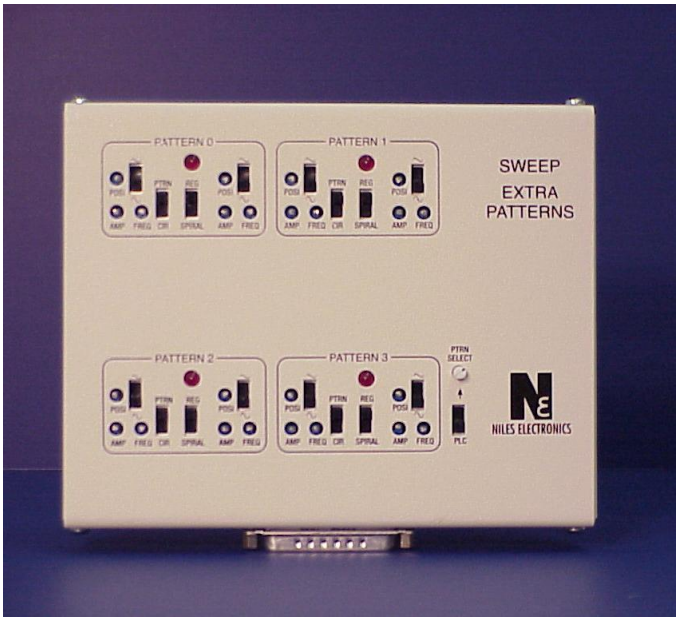
EMOTE HANDHELD CONTROL WITH JOYSTICK (OPTIONAL)

This remote handheld device replicates the functions and layout of the regular Sweep Module, but with the addition of the Pots/Stick switch and the Joystick to make lateral and longitudinal adjustments. For operation of this device, the connection needs to be made with the main Sweep unit and the Power Sweep unit turned on.

FUNCTIONS

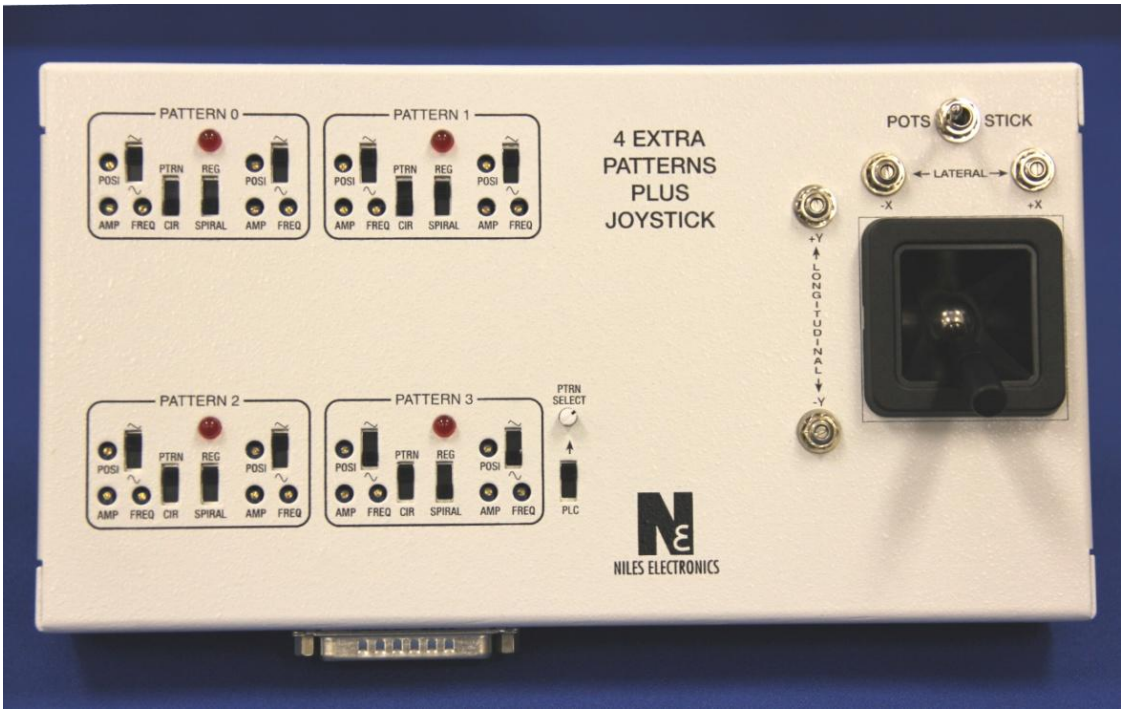
(Please refer to pages 2 to 3 in the "Functions" section for explanation of the replicated features.) The Pots/Stick switch selects between using the Potentiometers (Variable Resistors), or the Joystick for control of the beam position. Flipping the switch up to "Pots" allows the beam to be adjusted laterally with the knob labeled "Position" directly to the left of the switch, and longitudinally with the knob labeled "Position" directly to the right of the switch. The advantage to using the Potentiometers is that they can be locked into place so that an accidental bump to the knobs will not affect the beam. Flipping the switch to "Stick" allows the beam to be adjusted with the joystick laterally by moving the stick left or right, and longitudinally by moving the stick up or down. The Joystick is especially useful for preconditioning. The semi-variable resisters are used to limit where the beam can go on the e-beam gun pocket. Properly setting these resistors makes sure that the beam will not go out the pocket regardless of the joystick setting.

FOUR-EXTRA-PATTERN HANDHELD REMOTE CONTROL (OPTIONAL)



This device allows the user to create and store 4 additional patterns. The patterns can be selected either manually on the remote control unit, or from a PLC connected to the Sweep Module. (For the detailed chart please see page 4.) The same D-SUB Connector on the Ribbon Cable connects to either the Four-Extra-Pattern Hand-Held Remote or the Remote Hand-Held Control with Joystick.

FOUR-EXTRA-PATTERN HANDHELD REMOTE CONTROL PLUS JOYSTICK (OPTIONAL)



The left part of this remote control is identical with the Four Extra Pattern Remote Control. The right part is a joystick and its related components:

- Potentiometer / Joystick Selection Switch.
  i) When switch is flipped to POTS, the center position of the sweep pattern is controlled by the "Position" Semi-Variable Resistors of the selected pattern set. At this position, the joystick is left unfunctioning.
  ii) When switch is flipped to STICK, the center position of the sweep pattern is controlled by the "Joystick". This feature gives the operator capability to manually move the Electron Beam over the gun pocket.
- Lateral Semi-Variable Resistors.
  These two resistors set the center position limits in lateral direction.
- Longitudinal Semi-Variable Resistors.
  These two resistors set the center position limits in longitudinal direction.
  By properly setting these four Semi-Variable Resistors, the Electron Beam will be retained inside the e-gun pocket regardless of the Joystick position.

WARRANTY

The E-Beam Gun Switching Power Supply is guaranteed against faulty materials, functioning, and workmanship for a period of 12 months after delivery by Niles Electronics.

This warranty only covers failures due to defects in material or workmanship that occur during normal use, as described in this product manual. This warranty shall not apply if any repair has been performed or any alteration has been made by anyone other than an authorized Niles Electronics representative. This warranty shall not apply if failures occur which result from abuse, misuse, negligence, accident, mishandling, faulty installation, misapplication, improper operation or maintenance, alteration, modification, improper voltage supply, lightning damage, or damage that is attributable to acts of God.

The warrantor shall not be liable for incidental or consequential damages resulting from the use of this product, or arising out of any breach of this warranty. All express and implied warranties are limited to the applicable warranty period set forth above.

Repairs made under warranty at Niles Electronics' facilities will be made free of charge. Freight cost, both ways, will be at customer's expense. Niles Electronics reserves the right for any final warranty adjustment.

This warranty is limited only to repairs. No returns for refunds.

Safety Warning

IN CASE OF EQUIPMENT FAILURE:
If the equipment malfunctions, DO NOT ATTEMPT TO TROUBLESHOOT. The equipment was not designed for user troubleshooting, which may be dangerous to do. Contact Niles Electronics in the event of Power Supply failure. Shipment of the equipment back to Niles Electronics for repair may be necessary. If the customer's company cannot afford the down-time, it is recommended that spare units be purchased.

USER RESPONSIBILITY

The user is responsible for proper installation and operation, in accordance with the procedures described in this manual. If the user has any doubt about understanding these procedures, please contact Niles Electronics.

The warranty shall be null and void if the equipment has not been installed properly.

Alteration of the design of any function of the equipment, without the written consent of Niles Electronics, Inc. voids the warranty and is entirely the responsibility of the user.

CONTACT

Please contact Niles Electronics for any inquiries, installation, or troubleshooting issues that the user cannot resolve.

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