



HTR400X



HPR400RX-5

new

HIGH SPEED

Translator ■ Preset Indexer

SLO-SYN[®]

new

ABSOLUTE

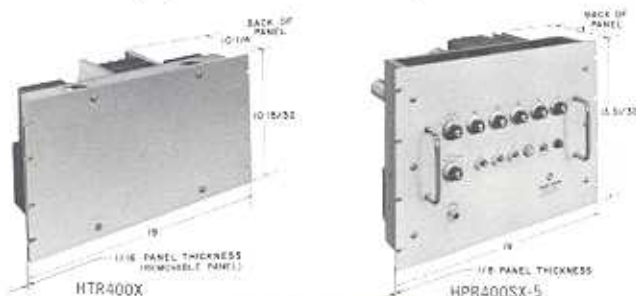
Preset Indexer



SA1800X-5

HIGH SPEED DRIVES

The new High Speed SLO-SYN Translators and Preset Indexers are used to drive SLO-SYN Precision Stepping Motors up to 2000 steps per second without losing any steps. These new high speed drives are rack mounted and have plug-in solid-state circuitry.



SLO-SYN® HIGH SPEED TRANSLATOR

This translator will advance the motor shaft one step for each pulse received. Available for triggering the translator circuits is an internal oscillator which can supply a variable frequency range adjustable from 50 to 2000 steps per second. A contact closure will cause the oscillator frequency to increase to the selected stepping rate. When the contact is opened, the oscillator will decelerate the motor to a stop.

TRIGGERING SIGNAL REQUIREMENTS

The translator is triggered by a negative change of voltage at terminal 6 for forward rotation or at terminal 7 for reverse rotation with respect to neutral terminal 8. Each triggering signal will cause the translator to drive the motor one step. The required triggering signal is a 10 to 15 volt negative change of voltage with a minimum pulse width of 50 microseconds. The translator will trigger on the leading edge of negative pulses and on the trailing edge of positive pulses. Triggering pulses can be supplied by tape readers, computers, oscillators, pulse generators and other signal producing equipment.

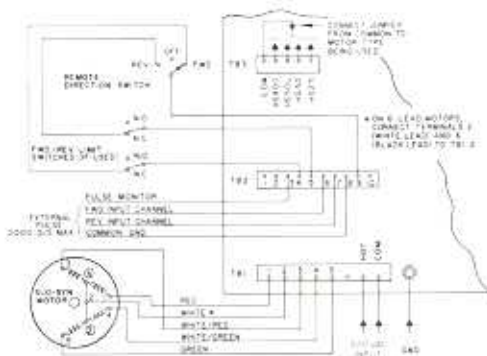
SPEED

Figures 3 through 9 show speed vs. torque characteristics for appropriate SLO-SYN Precision Stepping Motors driven by High Speed SLO-SYN Translators. When driven from the internal oscillator, the motor is automatically accelerated to the speeds shown and decelerated to zero when the oscillator is turned off. Acceleration and deceleration are also required when operating from external pulses. Approximately 65 milliseconds must be allowed to bring the pulse rate

up to speed when starting and to decrease it to zero when stopping. Large inertial loads may require additional time.

SPECIFICATIONS

MOUNTING	rack mounting — can also be mounted horizontally on a bench with front panel removed
INPUT	200-240 volts, 1.75 amperes
OSCILLATOR SPEED RANGE	50 to 2000 steps per second with automatic acceleration and deceleration
EXTERNAL TRIGGERING PULSE	-10 to -15 volt, 500 ohm impedance, 50 microsecond pulse width, 65 millisecond acceleration and deceleration time.
TEMPERATURE	operating: 0°C to 40°C storage: -55°C to 85°C



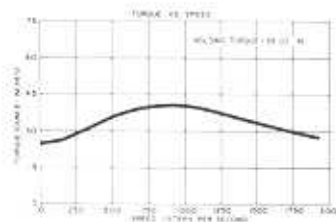
EXTERNAL WIRING
HIGH SPEED SLO-SYN TRANSLATOR
FIGURE 1

MODELS

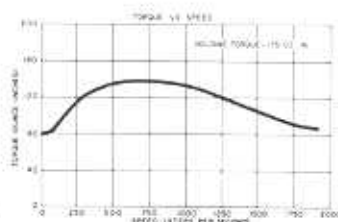
TYPE	USED WITH MOTOR TYPE
HTR400X	HS25, HS50, HS50L, TS25-100B, TS50-100I or LS50-100S (motor must be ordered separately)
HTR400SX	HS400B-1003 motor supplied

SLO-SYN® HIGH SPEED PRESET INDEXER

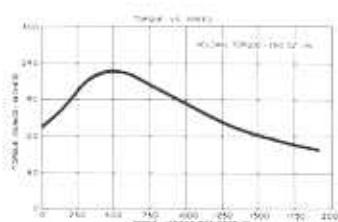
The new High Speed SLO-SYN Preset Indexers are used to drive SLO-SYN Precision Stepping Motors in indexing and other positioning operations. Decade counter controls on the front panel allow the operator to select any desired increment. When the index command is given, the unit will drive the motor the pre-selected number of steps and then actuate a relay which controls any external equipment needed for related operations. Acceleration and deceleration cir-



HS25 MOTOR
FIGURE 3



HS50 MOTOR
FIGURE 4



HS50L MOTOR
FIGURE 5

Covered by one or more of the following U.S. Patents: 3,218,473; 3,280,395; and 3,355,642. Patented Canada 1967.

cuits permit driving the motors at high speeds without missing steps. Figures 3 through 9 show the maximum loads which the appropriate motors can drive at various speeds. External wiring connections are shown in Figure 2.

BACKLASH TAKE-UP CIRCUIT

Backlash board BHM144134-G1, ordered separately, can be plugged into a receptacle on the indexer chassis to add backlash take-up capabilities. When backlash take-up is in effect the motor will take 16 additional steps when travel is in the minus direction and then take 16 steps in the plus direction. The motor will take only the required number of steps when travel is in the plus direction.

SPECIFICATIONS

INPUT	200-240 volts, 1.75 amperes, 50/60 hertz
SPEED RANGE	50 to 2000 steps per second with automatic acceleration and deceleration
TEMPERATURE	operating: 0°C to 40°C storage: -55°C to 85°C
DIMENSIONS (cabinet models)	height: 18" width: 22" depth: 16½"
EXTERNAL RELAY CONTACTS	220 VAC; 0.5 amp. resistive, 0.25 amp. inductive 28 VDC; 2 amp. resistive, 1 amp. inductive

EXTERNAL CONNECTIONS

As shown in the wiring diagram, terminals are provided on terminal board TB1 to permit remote control of all functions except speed adjustment or count insertion. The functions can be controlled with switches or relays or can be operated by voltage levels. Specifications for voltage level operation are given in the chart. All levels shown are with respect to circuit ground.

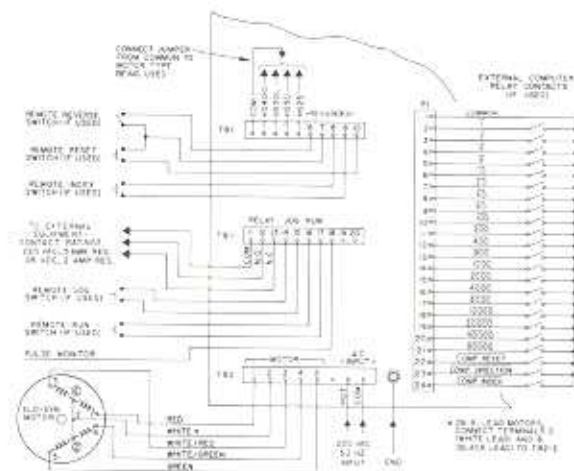
COMPUTER INPUT

A 24-pin connector provides access to the counters, start, direction and stop reset functions for remote

control from a computer or an external set of decade switches or relays. For switch or relay operation, contact closures in a standard BCD combination are required to set the count and direction.

Momentary contact closures with a minimum duration of 150 microseconds are required to Start Index or Stop Count and Reset.

Voltage levels can also be used to control these functions. The chart shows the requirements for voltage level operation. The count and the direction information are entered first. A delay of at least 2.5 milliseconds must be allowed after count and direction information is inserted before the Index signal is given.



HIGH SPEED SLO-SYN PRESET INDEXER EXTERNAL WIRING
FIGURE 2

MODELS

TYPE	RACK MOUNTING	COUNTING RANGE (STEPS)	USED WITH MOTOR TYPE
HPR400X-3	HPR400RX-3	0-999	HS25, HS50, HS50L, TS25-1008, TS50-1001 or LS50-1005 (motor must be ordered separately)
HPR400X-4	HPR400RX-4	0-9,999	
HPR400X-5	HPR400RX-5	0-99,999	HS400B-1003 motor supplied
HPR400SX-3	HPR400SRX-3	0-999	
HPR400SX-4	HPR400SRX-4	0-9,999	
HPR400SX-5	HPR400SRX-5	0-99,999	

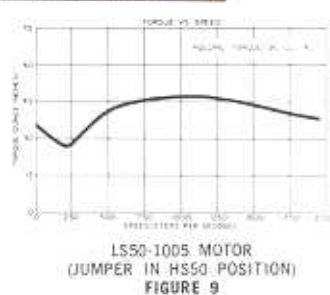
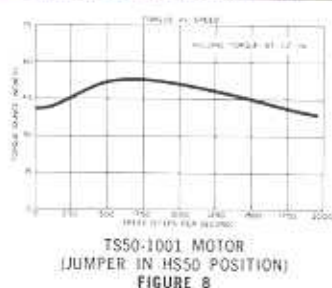
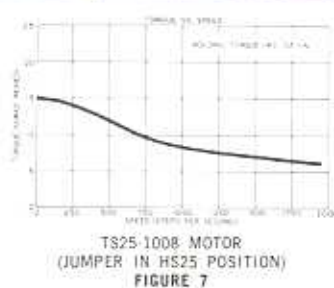
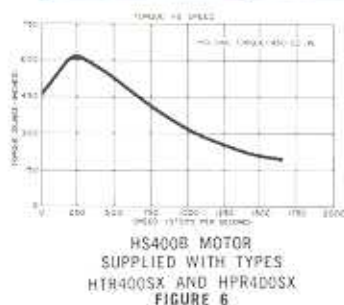
VOLTAGE LEVEL OPERATION FOR EXTERNAL CONNECTIONS

FUNCTION	TERMINAL ON TB1	VOLTAGE LEVELS*		MAX. CURRENT	REQUIRED DURATION	EXTERNAL RESISTANCE†
		STANDBY	INITIATE ACTION			
DIRECTION	6	+20 volts d-c	0 to +1 volt d-c	1 ampere	3 milliseconds or longer	20 ohms
INDEX	9	+20 volts d-c	0 to +1 volt d-c	1 ampere	150 microseconds or longer	20 ohms
JOG	14	+20 volts d-c	0 to +1 volt d-c	1 ampere	3 milliseconds or longer	20 ohms
RUN	16	0 to 0.5 volt d-c	+20 volts d-c	1 milliampere	entire running time	none
RESET	20	+20 volts d-c	0 to +1 volt d-c	1 ampere	150 microseconds or longer	20 ohms

†Must be connected to appropriate terminal in series with the voltage source.
*All voltage levels are with respect to circuit ground (terminal 7, 8 or 19).

VOLTAGE LEVEL OPERATION FOR COMPUTER INPUT

FUNCTION	VOLTAGE LEVELS		MAX. CURRENT	REQUIRED DURATION
	STANDBY	INITIATE ACTION		
DIRECTION	+20 volts d-c	0 to +1 volt d-c	20 milliamperes	3 milliseconds or longer
INDEX	+20 volts d-c	0 to +1 volt d-c	20 milliamperes	150 microseconds or longer
RESET	+20 volts d-c	0 to +1 volt d-c	40 milliamperes per decade	150 microseconds or longer
COUNT INSERTION	+20 volts d-c	0 to +1 volt d-c	2 milliamperes per insertion	3 milliseconds or longer



SLO-SYN® ABSOLUTE PRESET INDEXERS

SLO-SYN Absolute Preset Indexers of the SA1800X Series are used to control SLO-SYN stepping motors in indexing and positioning operations. The operator selects the desired positioning increment by setting counter controls on the front panel and presses the INDEX button to start the motion. In the absolute positioning mode, the number set on the controls determines the final position of the motor relative to the starting or

"zero" point. When incremental positioning is used, the motor will move the preselected number of steps each time the INDEX button is pressed. The indexer will automatically actuate a relay to energize any external equipment needed to perform related operations. Jog and free run modes of operation are included to cut set-up time by allowing movement without the need for setting the counter controls.



SA1800X-5

ABSOLUTE POSITIONING

When absolute positioning is used, the position or number set on the counter controls is relative to the starting or "zero" point. For example, a setting of 250 would cause the indexer to position the motor 250 steps from the zero point. No further movements could be made until the controls were set to a new count. A new setting of less than 250 would cause the unit to drive the motor in the reverse direction until it was the proper number of steps from the zero point. A higher count would cause the motor to be driven further from the zero point.

INCREMENTAL POSITIONING

In the incremental positioning mode, the indexer will drive the motor the number of steps set on the counter controls each time it is actuated. Movement can be in either the plus or the minus direction.

SPEED

Figures 10 and 11 show speed vs. torque characteristics for typical SLO-SYN motors when driven by the SLO-SYN Absolute Preset Indexer. Appropriate motors and their corresponding speed-torque curves are the same as for standard preset indexers. Refer to Catalog SS1265E for the complete set of motors and curves.

OPTIONAL BACKLASH TAKE-UP CIRCUIT

Backlash circuit board BHM144138-G1 is available for use with any SA1800X Series unit to add backlash take-up capabilities. The indexer is already wired for this circuit and a switch is provided on the rear of the

unit for turning the take-up circuit on or off. All that is required is to plug the board into a receptacle on the indexer chassis.

The backlash circuit compensates for play in standard lead screws or gears by always making the final approach to a position from the same direction. When travel is in the plus direction, the indexer will drive the motor 16 steps past the required position and then reverse the motor for 16 steps. In the minus direction, the indexer will drive the motor only the required number of steps.

MODELS

TYPE	COUNTING RANGE
SA1800X-3	0-999
SA1800X-4	0-9,999
SA1800X-5	0-99,999

SPECIFICATIONS

DESIGN	Self-contained control unit using solid-state electronics
CONTROL MODES	Absolute positioning, incremental positioning jog (one step at a time) and free run
SPEED	Minimum speed 5 steps per second, Maximum speed varies with motor.
TEMPERATURE RANGE	Operating: 0°C to 40°C Storing: -55°C to 85°C
INPUT	200-240 volts a-c, 0.75 amperes, 50/60 hertz
CONTACT RATINGS, AUXILIARY FUNCTION RELAY	220 VAC; 0.5 amp. resistive, 0.25 amp. inductive 28 VDC; 2 amp. resistive, 1 amp. inductive

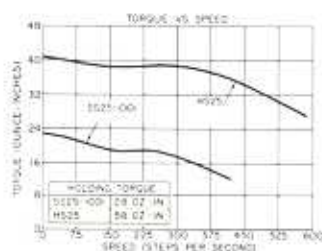


FIGURE 10

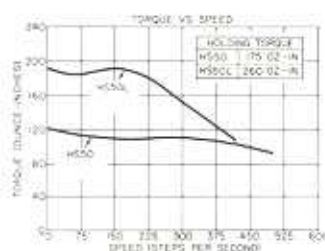


FIGURE 11

Covered by one or more of the following U.S. Patents: 3,218,473; 3,280,395; and 3,355,642. Patented Canada 1967.

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.

ALL PRODUCTS ARE MANUFACTURED IN THE U.S.A. BY THE SUPERIOR ELECTRIC COMPANY, BRISTOL, CONNECTICUT

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