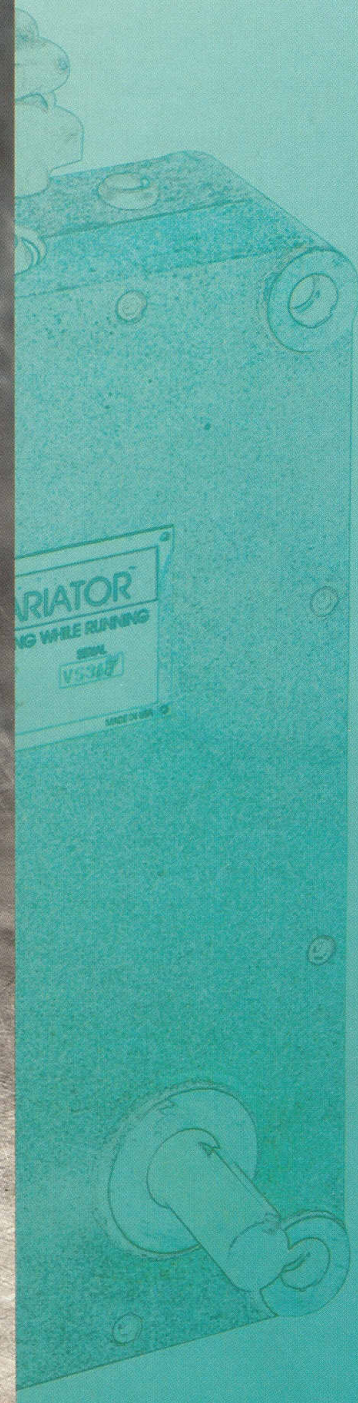
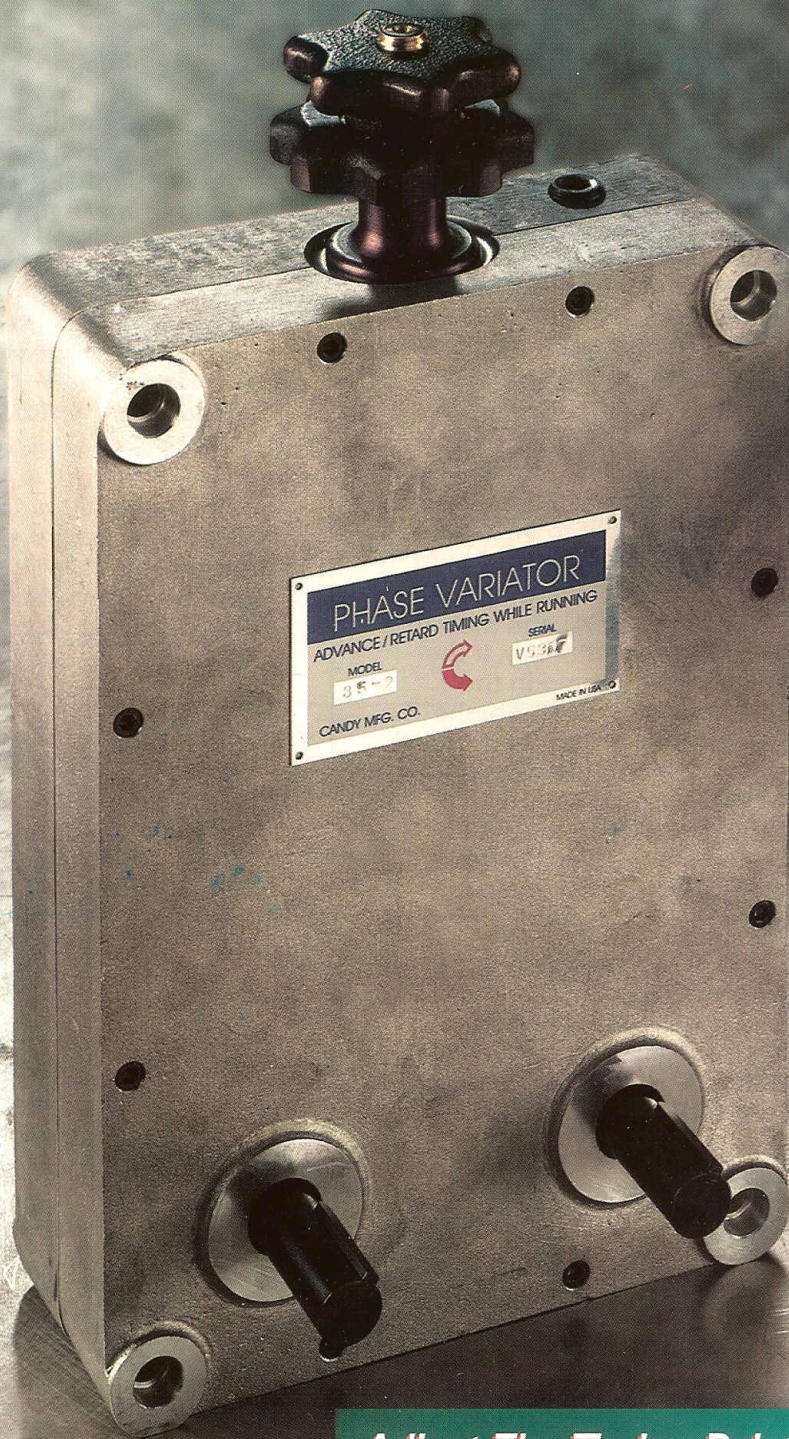
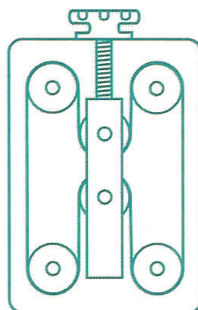


PHASE VARIATOR



Adjust The Timing Relationship Of Machine Components



- 1:1 phase transmissions provide a full 0-360 degree range of position control.
- Economical motion control in a dependable, versatile mechanical design.
- Reduce costly downtime associated with trial and error start-ups and changeovers.

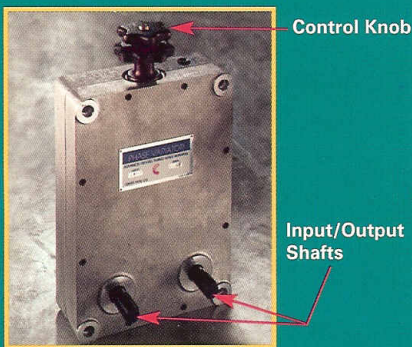


DESCRIPTION

The Phase Variator is the economical timing mechanism used to adjust the position of various machine components—even while running. Installed between the driven machine and the process which requires timing, the Phase Variator provides a full 360 degree range of position control.

In normal operation, with the control knob stationary, the Phase Variator operates as a 1:1 phase transmission with input and output shafts rotating in the same direction. When a rotation is applied to the control knob, a differential action occurs between the input and output shafts allowing a machine operator to synchronize a production process.

This simple, positive timing device is ideal for more efficient machine set-ups and changeovers. The Phase Variator is the low cost answer to the timing challenges facing today's machine designers.



PRINCIPLE OF OPERATION

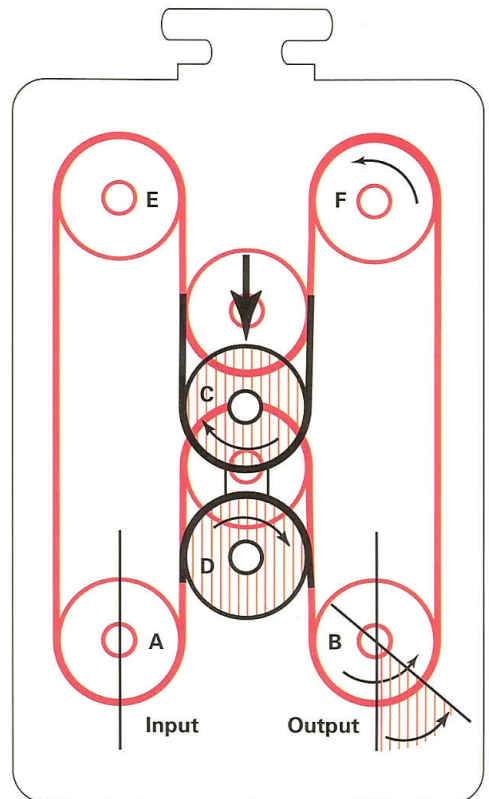
The Phase Variator's design is simple, yet unique. Each unit is comprised of the following major components: six chain sprockets, a piece of roller chain, a sliding yoke assembly and a control knob.

Sprockets A and B are keyed to the input and output shafts, allowing either to be used as the input. The other four sprockets serve as idlers. Idler sprockets C and D are mounted in a sliding yoke assembly which may be adjusted along its travel by rotating the control knob. An endless roller chain engages all six sprockets as shown in the diagram.

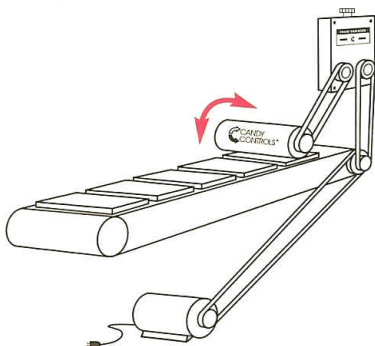
Assume that shaft A, and therefore sprocket A, are stationary. If the control knob is rotated in the counterclockwise direction, the yoke assembly will begin to travel downwards along the threaded control knob shaft. As a result, shaft B will change its position relative to shaft A, as the chain from sprocket C is taken up by sprocket D.

If shaft A is the input and the control knob is rotated in the clockwise direction, shaft B will then advance its position relative to shaft A. If shaft B is the input and the control knob is rotated in

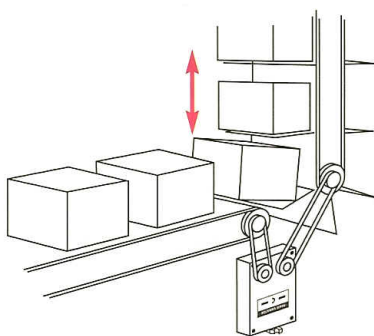
the clockwise direction, shaft A will retard its position relative to shaft B. In either direction, the yoke may reach the end of its travel and must then be reversed to make further phase adjustments.



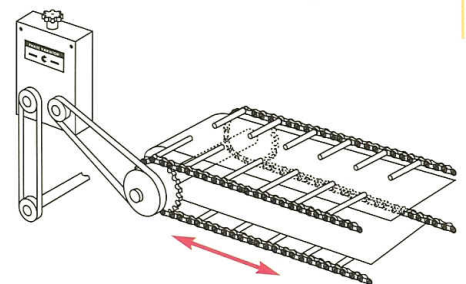
TYPICAL APPLICATIONS



Adjust the phase of printing cylinders and other types of applicator heads.



Synchronize the timing of machine components from a driven line shaft.



Change flight or lug positions for more efficient production set-ups and changeovers.

TECHNICAL DATA

CONSTRUCTION: The Phase Variator housing is made from cast aluminum. The input and output shafts are fabricated from steel and have a black oxide finish. The input/output shafts and all internal sprockets are supported by needle bearings with separate oil seals. The combination of the above features provides for a long, trouble-free life.

CONTROL KNOB: The control knob has an internal thread and engages a centrally located thread shaft which is pinned to the sliding yoke assembly. Rotation of the knob thereby raises and lowers the yoke. The control knob ratio is 36:1. That is, one full turn of the control knob produces a 10° change in the rotational location of the output shaft relative to the input shaft. See principle of operation for position adjustment directions.

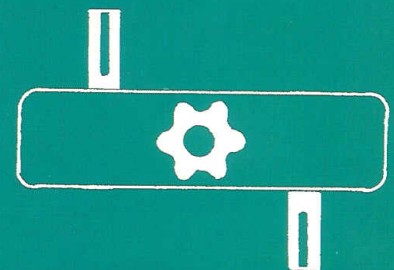
CHAIN ADJUSTMENT: If chain wear becomes excessive, the chain may be tensioned without disassembling the unit. The control knob must be rotated until the sliding yoke assembly is at the bottom of its travel. Next, remove the two allen head screws located on the bottom of the housing, exposing the adjusting screws in the base of the yoke assembly. The equal tightening of these screws increases chain tension. After adjustment, the shafts should turn freely with no appreciable backlash.

LUBRICATION: All Phase Variators are shipped from the factory with a multiple purpose grease lubricant. Although all working parts are well protected, repacking of the bearings may be required in severe operating environments.

MOUNTING/INSTALLATION

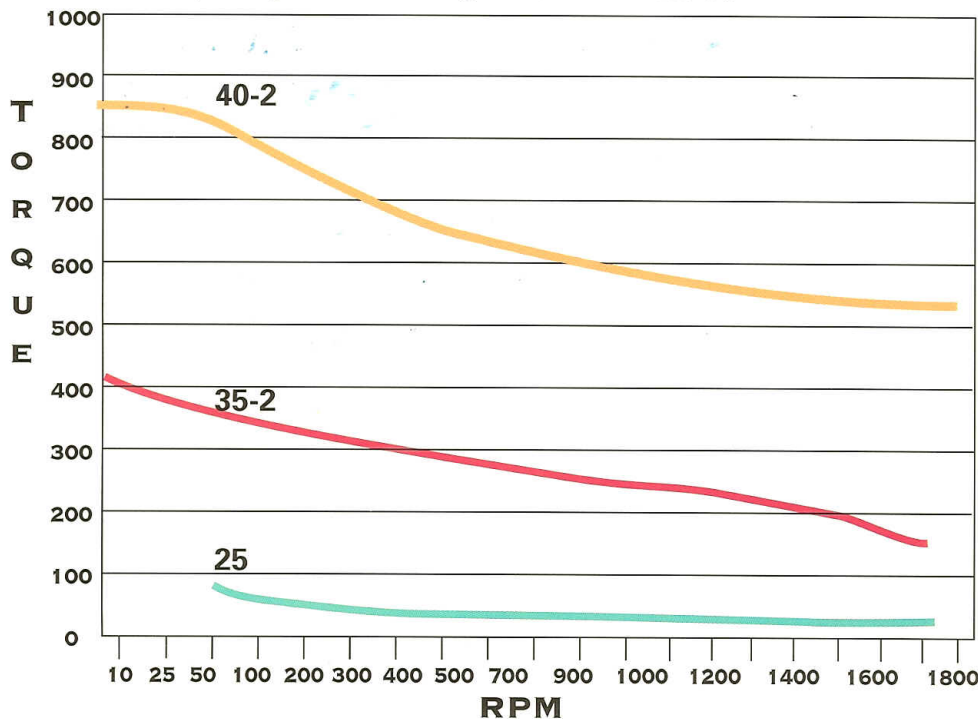
The standard Phase Variator configuration has both the input and output shafts extending from the front face of the housing. When the Phase Variator is to be driven by sprockets or pulleys, it is sometimes necessary to use drive gears that are larger than the I/O shaft center distance will allow. As a result, it may be necessary to specify the Phase Variator with one of the shafts reversed. Both right-hand and left-hand shaft reverses are available from the factory.

All models have (4) mounting holes located in each corner of the housing. Using these mounting holes and the mounting bolts supplied with each unit, the Phase Variator may be either face or back mounted in any position.



Left-Hand Reverse

TORQUE (INCH LBS.) VERSUS RPM



The horsepower and torque ratings of the Candy Phase Variator product line are based on the use of six 17 tooth sprockets in a 1 to 1 configuration.

Type A Lubrication for manual or drip is applicable up to noted RPM. Type B Lubrication, for bath or slinger disc, is applicable to speeds higher than noted. Using the standard grease lubricant, input speeds in excess of 825 RPM are not recommended. Contact the factory for further information.

MODEL PV 40-2

MODEL PV 35-2

MODEL PV 25

ORDERING

When ordering a Phase Variator, it is important to:

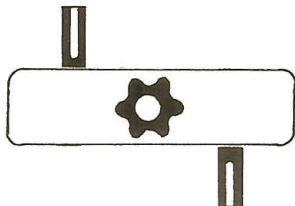
1. Choose the appropriate size based on required operating torques and speeds. The "E" Stop or maximum torque condition must be considered when sizing the unit.
2. Choose the appropriate shaft configuration: standard, right-hand reverse or left-hand reverse.

TORQUE VERSUS RPM

PV-25 PV-35-2 PV-40-2

TORQUE @ 50 RPM	63	343	793
HP @ 50 RPM	.05	.27	.63
TORQUE @ 500 RPM	46	266	627
HP @ 500 RPM	.37	2.11	5
TORQUE @ 1200 RPM	42	244	576
HP @ 1200 RPM	.81	4.64	11
TORQUE @ 1800 RPM	40	234	533
HP @ 1800 RPM	1.16	6.68	15.23

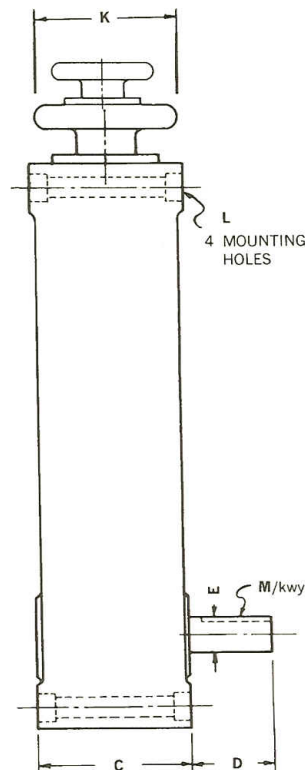
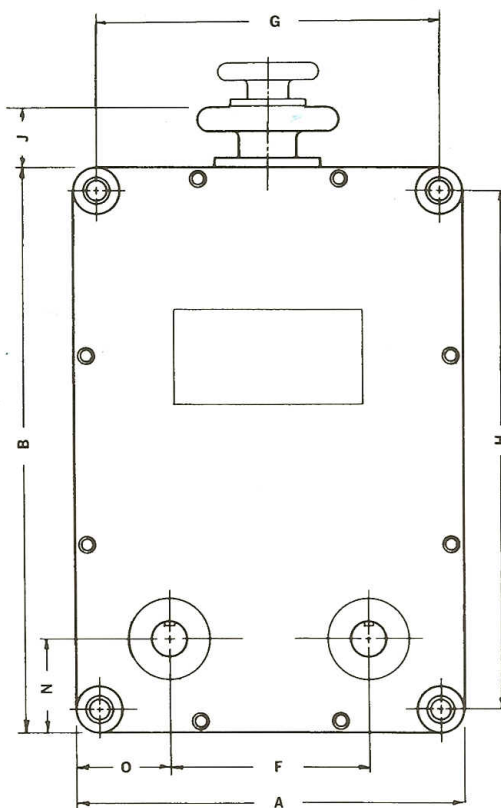
Torque ratings are in inch pounds and are based on the use of six 17 tooth sprockets. Model number indicates the standard A.S.A chain size used in the Phase Variator. -2 indicates double strand chain. All dimensions and specifications are subject to change without notice.



All units are available with one shaft reversed. Both left-hand and right-hand reverses are available from the factory. Schematic represents a typical left-hand reverse shaft configuration.

DIMENSIONS

MODEL	25	35-2	40-2
A	5	8¼	11
B	8	12	16
C	2¼	3¼	5
D	1¼	1¾	2¾
E	¾	¾	1¼
F	2½	4¼	5½
G	4¼	7¼	9¾
H	7¼	11	14¾
J	1¾	2½	3
K	2	3	4
L	1½	7/16	9/16
M/kwy	1/8	3/16	1/4
N	1¼	2	2¾
O	1¼	2	2¾



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