CANDY CONTROLS®

CATALOG 217-D
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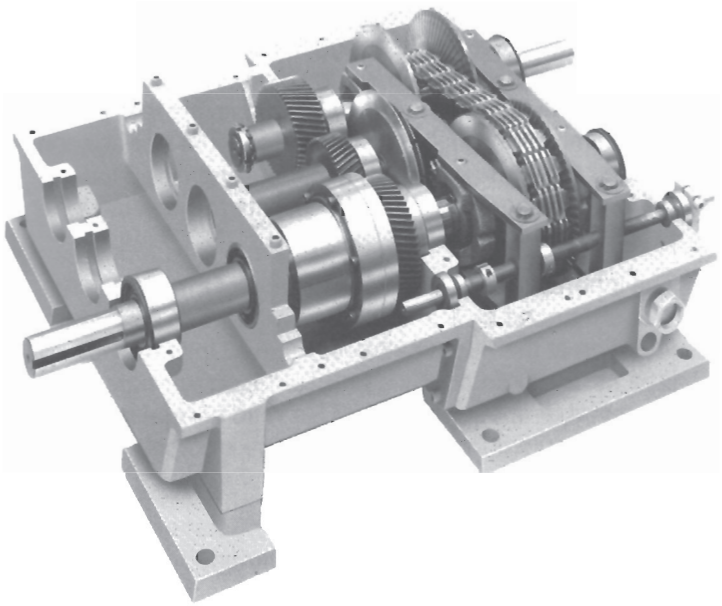
Harmonic® Drive

DRAW TRANSMISSIONS*



APPLICATIONS

The Candy Controls HARMONIC DRIVE Draw Transmission incorporates strain wave gearing principles which allow application of the unit in precise control of equipment. The Harmonic Drive has high torque capacity, zero backlash and high single stage ratio.

The effect of tooth to tooth error is minimized with strain wave gearing since about 10% of the total teeth are always in engagement. This unit is an excellent choice for positional accuracy and repeatability in narrow draw applications (3.5% or less) such as web-offset printing.

FEATURES

- Equipped with automatic chain tensioner
- Requires shutdown only for normal maintenance such as oil change
- Infinitely adjustable to any speed setting within rated speed range
- Self-adjusting variable pitch all metal chain
- Accurate control screw turns indicator
- Horizontal or vertical mounting
- Self-contained splash lubrication
- All metal construction, cast iron housing
- Compact design
- Oil level sight gages
- Multiple shaft arrangements
- Gearing, integral motor, Vernier control, remote control options available

BENEFITS

- Maintains proper chain tension through entire chain life
- Reduces down time
- Eliminates step adjusting of speed
- Assures positive power transmission
- Shows control screw turns; relates input/output speed ratio
- Allows space conservation
- Minimum maintenance required
- Assures long life and higher torque transmission
- Allows easy mounting on machinery
- Allows instant determination of oil level
- Covers most applications of input and output
- Accommodates special speed requirement, allows finer speed adjustment

*Patent Pending

SPECIFICATIONS

CAPACITIES AND RATINGS

Harmonic Drive Draw Transmissions are available with an infinite number of output speed ranges. The tables list torque capacity and speed ranges for the various size units available, with draw range or output speed nominally expressed in percent. The tables show TYPICAL speeds for 0.35, 0.75, 0.94, 1.5, 1.9, and 2.6% draw.

For most applications, the standard ranges shown in the rating tables will bracket the range required.

Type A units are available in three basic styles and as vertical or horizontal configurations. All have the input and output shafts on opposite sides. Output shafts can be in any of three locations, dependent in part upon the output speed. The designations HDDY, HDDX and HDDZ refer to the shaft positions. (See transmission style drawings on page 8.)

Units with ouput shafts at position Z have no output gearing and the output shaft is directly extended from the harmonic output. This unit is designated as an HDDZ and the output speed is a function of the draw range. With the output shaft at position X, single stage output speed-up or reduction gearing is included and unit designation becomes HDDX. Units with the output shaft at position Y have double stage output gearing and are referred to as HDDY transmissions. The three basic styles are, Style 1, which does not incorporate step-up or reduction input gearing, Style II which has a single stage input gear set and Style III, which incorporates an integrally mounted synchronous or induction motor as the prime mover.

SPEED ADJUSTMENT

The Harmonic Drive Draw Transmission is normally provided with a manual handwheel control. Because of the narrow speed range of the HDD unit, the ratio of handwheel turns versus output speed in RPMs is ideal. Even greater resolution of control can be attained by incorporating a 7.5:1 or 30:1 vernier control in which case the number of handwheel turns will be multiplied by 7.5 or 30 to complete a full range speed change. When used, the vernier control is normally supplied as an integral part of the transmission, but the feature can be added to a unit already in the field for a remote vernier control available in either ratio.

Other control arrangements include Mechanical Remote Control, Lever Control, Electric Remote Control and Automatic Hydraulic or pneumatic control for use in automated applications.

OPERATING

The HDD Units have unsurpassed inherent output speed regulation. The only element which can vary in speed ratio or setting as a result of load changes is the variable pitch chain. The effect of variation in this element is small because only a minor portion of the transmitted power is carried through it. The amount of power carried through the chain is a function of the draw range built into the unit; the narrower the range, the less power is transmitted through the chain. Maximum power seen by the chain is less than 1% of the transmitted load at 0.35% draw and is less than 5% of the transmitted load at 2.6% draw.

The inherent output speed regulation of the HDD is further enhanced by the strain waive gearing. The actual variation at the ouput of the Harmonic Drive may be as little as 1/6000th of any speed variation attributable to the variable speed element. This ratio of relative regulation is a function of the speed range incorporated into the transmission.

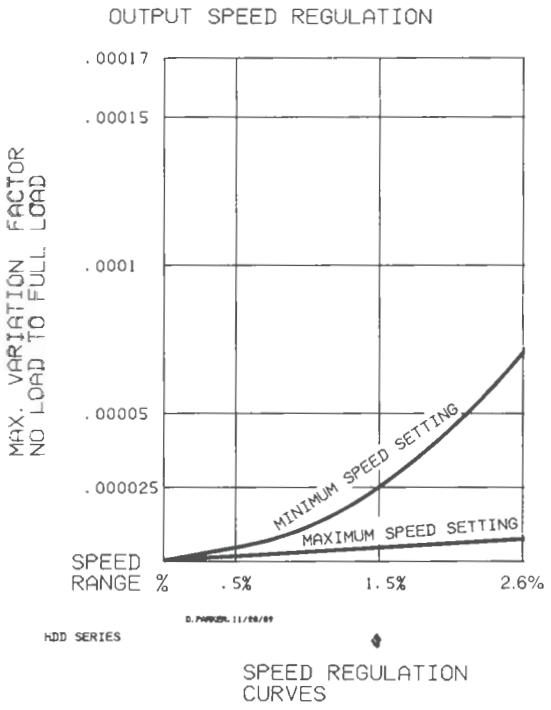
The accompanying table, (Figure 1), lists unit % variation in speed at maximum and minimum output speed settings for various draw ranges and this data is further illustrated in the output speed regulation curves, (Figure 2). The inherent improvement in regulation resulting from a narrower draw range is readily apparent from these curves.

It should be noted that the accuracy of operating speed regulation is greater at maximum output draw or speed setting than it is at minimum draw setting.

Output Speed Regulation

Speed Range	Maximum	Minimum
2.6%	.0009%	.007%
	.008 rpm	.065 rpm
1.9%	.0005%	.004%
	.004 rpm	.037 rpm
1.5%	.0003%	.003%
	.003 rpm	.024 rpm
.94%	.0001%	.001%
	.001 rpm	.009 rpm
.75%	.00008%	.0007%
	.0007 rpm	.006 rpm
.35%	.0001%	.0003%
	.001 rpm	.003 rpm

FIGURE 1



SPEED REGULATION CURVES

FIGURE 2

TORQUE CAPACITY

HDD Transmissions are rated for constant torque capacity throughout the range of draw adjustment. The output torque ratings remain unchanged if the input speeds are the same or less than the maximum listed in the selection tables.

Output torque capacity is a function of unit rated power capacity and output speed built into a specific transmission. The torque capacity for any transmission can be calculated from the equation.

T=HPx 63000 divided by RPM where T is expressed in Pound-inches. The speed used in this determination should be the maximum of the draw range in the particular application. In no case, however, should the torque capacity exceed the conditions shown in the accompanying table, (Figure 3).

OUTPUT TQ. RANGE (LB – IN)

UNIT SIZE	MAXIMUM MECHANICAL LIMIT AT X OR Y SHAFT
1/2	1500
1	2400
2	3000
3	4100
4	7200
5	8900

FIGURE 3

An additional table, (Figure 4), is provided which lists the torque capacity at the Z shaft for the various HDD unit sizes.

The standard HDD transmission model suffix-89 is furnished with the Varichain integrally mounted to the HARMONIC DRIVE housing.

TORQUE CAPACITY

UNIT SIZE	MAX INPUT	* OUTPUT TORQUE	* * MAXIMUM TORQUE
1/2 HDDZ	720 RPM	412 # "	855 # "
1 HDDZ	900 RPM	645 # "	1290 # "
2 HDDZ	900 RPM	1076 # "	2150 # "
3 HDDZ	900 RPM	1615 # "	3230 # "
4 HDDZ	720 RPM	2700 # "	5400 # "
5 HDDZ	720 RPM	4040 # "	8080 # "

* OUTPUT TORQUE - MAXIMUM CONTINUOUS OPERATING TORQUE
* * MAXIMUM TORQUE - REPETITIVE MOMENTARY TORQUE (SUCH AS E-STOP)

FIGURE 4

PRINCIPLES OF OPERATION

The base components of the FAIRCHILD HARMONIC DRIVE DRAW TRANSMISSION are an infinitely variable all metal chain and wheelface combination and a HARMONIC DRIVE differential. The input to the transmission drives the constant speed pulley of the variable element and the circular spline of the HARMONIC DRIVE, (Figure 5).

By controlling the speed of the elliptical wave generator of the HARMONIC DRIVE from the adjustable shaft of the variable chain connection, the output of the HARMONIC DRIVE is controlled within a highly compressed speed range. Within the HARMONIC DRIVE, the teeth on the nonrigid flexible spline and the rigid circular spline are in continuous engagement. (The outer race of the wave generator is the flexible spline.) The Flexspline has two teeth fewer than the circular spline. One revolution of the Wave Generator input causes relative motion between the Flexspline and the Circular spline equal to two teeth. With the Circular Spline rotationally fixed, the Flexspline will rotate in a direction opposite to the input at a reduction ratio equal to the number of teeth on the Flexspline divided by two.

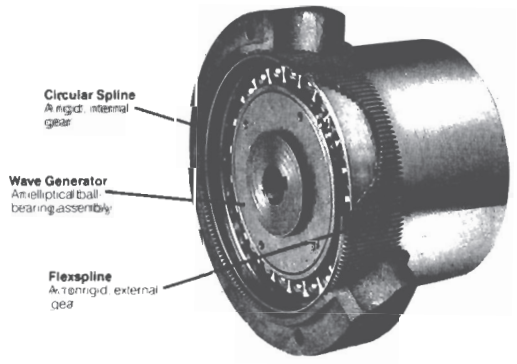


FIGURE 5

If in the Figure 6 a Flexspline tooth is fully engaged when the major axis of the wave generator input is at zero degrees, when the major axis of the Wave Generator is rotated to 90 degrees, the tooth will be disengaged. Full engagement occurs at 180 degrees and again when the major axis of the Wave Generator rotates back to zero, producing the two tooth advancement per input revolution, (Figure 7).

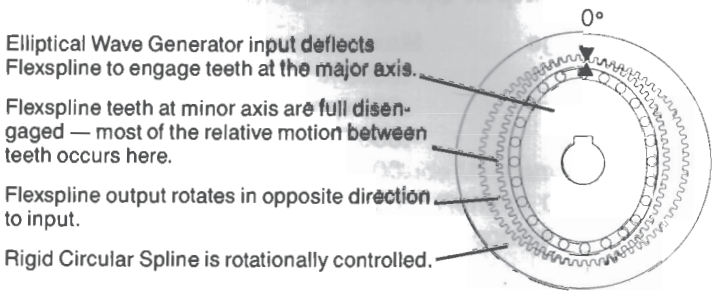


FIGURE 6

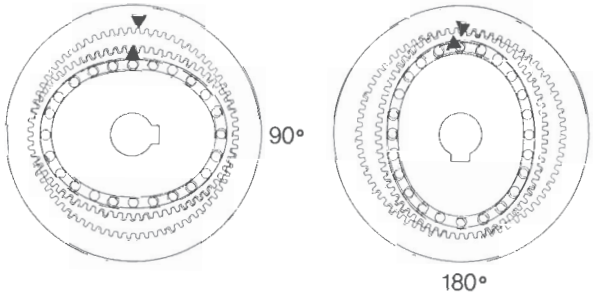


FIGURE 7

The output speed range is a function of the Harmonic reduction ratio and the speed range of the Varichain. The higher the harmonic reduction ratio and the narrower the speed range of the Varichain, the narrower the speed range of the HARMONIC DRIVE Draw Transmission and consequently the greater the accuracy.

The HARMONIC DRIVE Draw Transmission is provided as a semi-custom item. Since it also includes an output gear section, output speed ranges and magnitude of output speed can be provided to match the application requirements exactly.

The extreme accuracy and fine control of the HARMONIC DRIVE Draw Transmissions make them excellent in applications such as web control on printing presses, film processing equipment, paper making machines, glass drawing machines, conveyor synchronizing drives, fiber winding and drawing machinery, shingle cutting machinery, converting machinery and metering pumps.

ORDERING INFORMATION

Contact the factory for your application. The information required to select a unit is:

1–Exact input speed
2–Output speed
3–Input and output shaft location
4–Control handwheel location
5–Service factor

CROSS SECTIONS

Two basic types of HARMONIC DRIVE Draw Transmissions are available. Type A is similar to the cross section view shown in Figure 8. Input and output shafts are always on opposite sides.

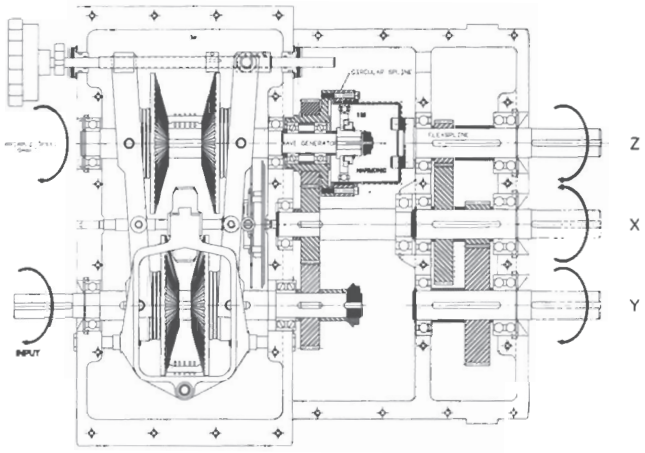


FIGURE 8
CROSS SECTION OF TYPICAL TYPE A HDD TRANSMISSION

SELECTION TABLES

Output speeds, other than typical speeds listed in the Selection Tables, can also be provided at the Z shaft.

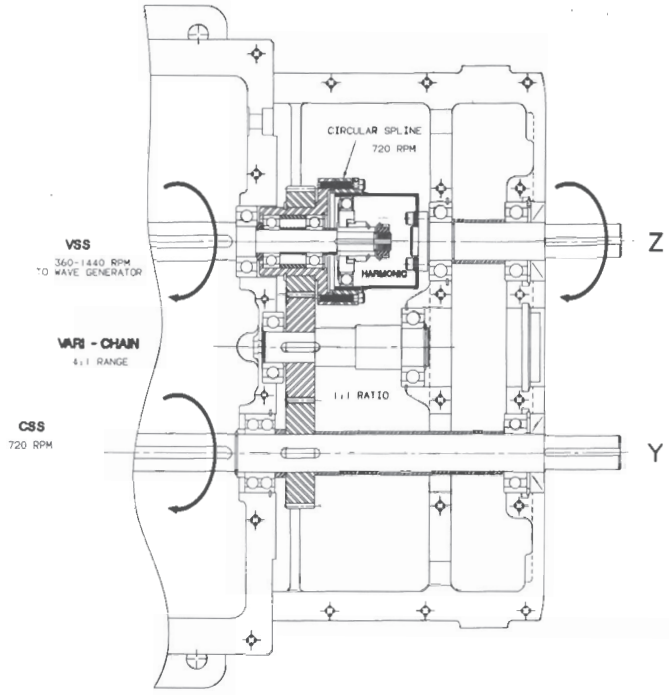


FIGURE 9
TYPE B HDD TRANSMISSION

Type B units differ in that input and output shafts are both on the same side of the transmission. The internal configuration and the principle of operation are similar to the Type A unit. The input shaft location is always designated as position Y and the output shaft as position Z (See Figure 9).

HORSEPOWER RATING TABLE

Size	HP
1/2	4.5
1	9
2	15
3	22.5
4	30
5	45

HDD-89 HARMONIC DRIVE DRAW TRANSMISSION
TYPE A STYLE 1

RATED INPUT SPEED 720 RPM

DRAW OR SPEED RANGE AND OUTPUT RPM												
½ HDDZ-89 4 HDDZ-89 5 HDDZ-89	.35%		.75%		.94%		1.5%		1.9%		2.6%	
	min	max	min	max	min	max	min	max	min	max	min	max
	rpm		rpm		rpm		rpm		rpm		rpm	
	718.5	721	716.4	721.8	715.5	722.3	712.8	723.6	711	724.5	706.9	725.3

*3.5 % draw is not available for 1/2 HDDZ-89 Output speeds at Z shaft

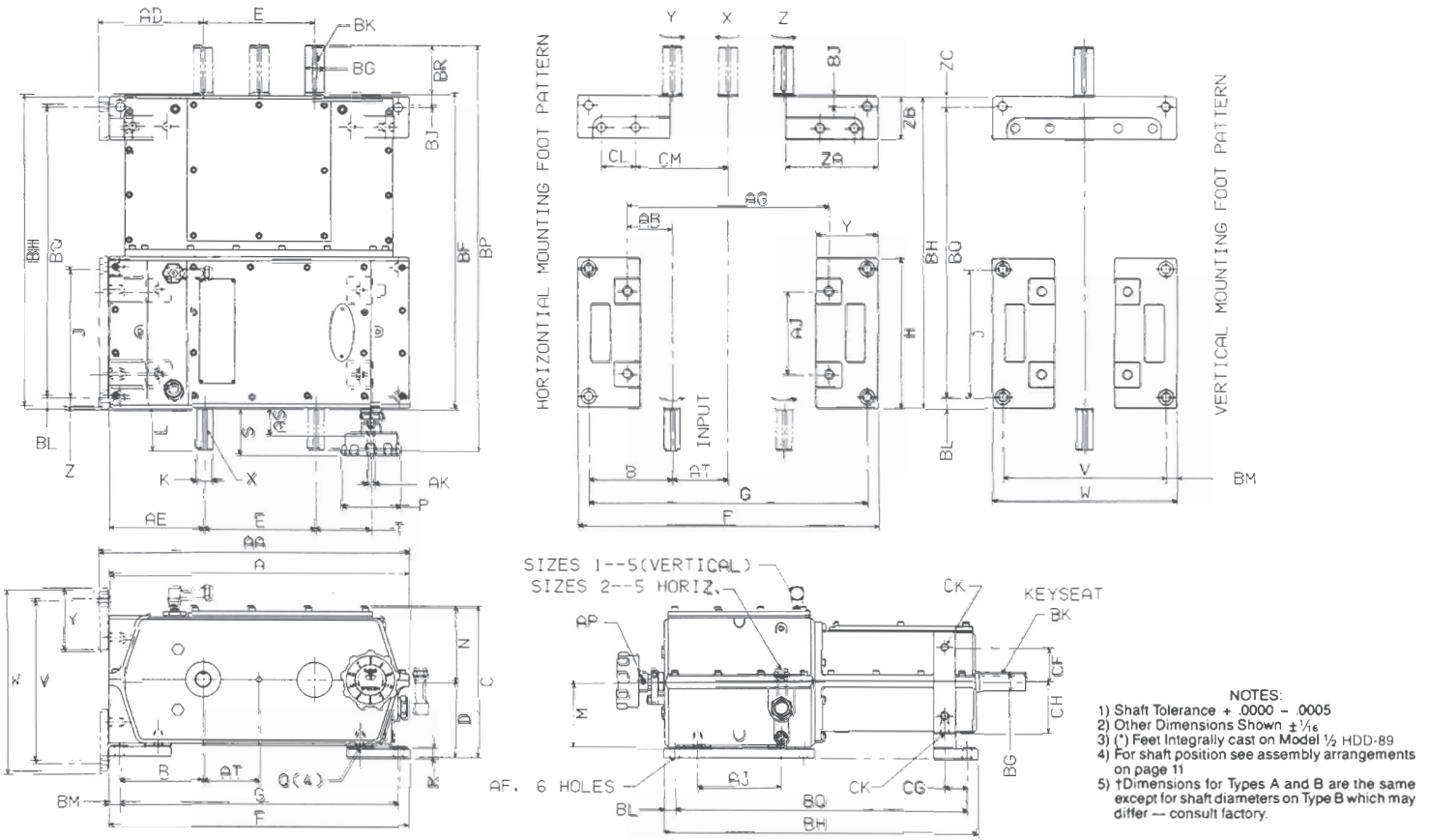
HDD-89 HARMONIC DRIVE DRAW TRANSMISSION
TYPE A STYLE 1

RATED INPUT SPEED 900 RPM

DRAW OR SPEED RANGE AND OUTPUT RPM												
1 HDDZ-89 2 HDDZ-89 3 HDDZ-89	.35%		.75%		.94%		1.5%		1.9%		2.6%	
	min	max	min	max	min	max	min	max	min	max	min	max
	rpm		rpm		rpm		rpm		rpm		rpm	
	898.1	901.3	895.5	902.3	894.4	902.8	891	904.5	888.8	905.6	883.7	906.7

Other output speeds can be provided at the Z shaft. Consult the factory for details.
For X and Y shaft ratio data consult factory for details.

OUTLINE DIMENSIONS — TYPE A and TYPE B, STYLE I HDD TRANSMISSIONS



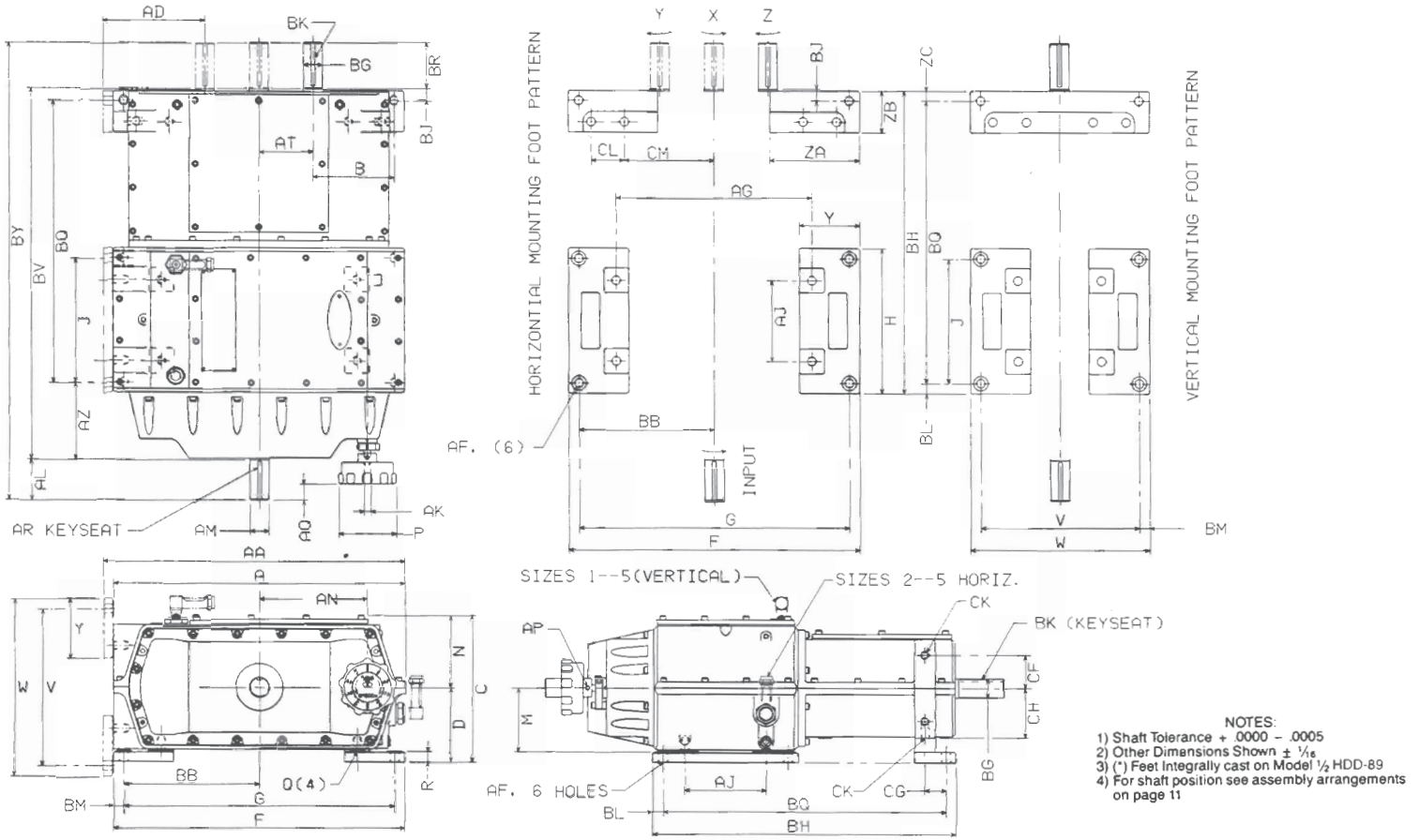
NOTES:
1) Shaft Tolerance + .0000 – .0005
2) Other Dimensions Shown ±1/16
3) (*) Feet Integrally cast on Model 1/2 HDD-89
4) For shaft position see assembly arrangements on page 11
5) †Dimensions for Types A and B are the same except for shaft diameters on Type B which may differ — consult factory.

Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	V	W	X	Y	Z	AA	AB	AD	AE
5	39 1/2	10 5/8	20	10 7/16	16	39 1/2	37 1/4	19 5/8	17 1/2	1 3/4	4 1/2	8 15/16	9 9/16	6	7/8-9	1 1/2	3 3/4	8 1/16	20 1/8	22 3/8	3/8 x 3/16 x 4 1/4	7 3/8	1 3/16	41	6	13 1/4	11 3/4
4	32 1/4	8 1/2	16 1/16	8 1/4	13	32	30	16	14	1 9/16	4	7 1/4	7 13/16	6	5/8-11	1	3 11/16	6 1/2	14 1/2	16 1/2	3/8 x 3/16 x 3 3/4	6	1 1/8	33 1/4	5	10 5/8	9 5/8
3	26 3/8	7 5/8	13 9/16	7	10 1/4	26 3/4	25 1/2	14 1/8	12 1/4	1 5/16	3 1/2	6	6 9/16	6	1/2-13	1	3 5/8	5 3/8	14 7/8	16 1/8	5/16 x 5/32 x 3 1/2	5	15/16	27 3/8	4 3/16	9	8
2	22 3/4	6 1/4	11 7/8	6 3/16	8 5/8	22 3/4	21 1/8	12 1/4	10 5/8	1 1/8	2 3/4	5 3/16	5 11/16	3 1/2	1/2-13	1	2 9/16	4 13/32	12	13 5/8	1/4 x 1/8 x 2 5/8	4 3/8	1	23 3/4	3 9/16	8 1/16	7 1/16
1	17 1/2	4 7/8	8 7/8	4 1/2	6 1/2	17 1/2	16 1/4	8 3/4	7 1/2	15/16	2 3/8	3 7/8	4 3/8	3 1/2	1/2-13	5/8	2 11/16	3 1/4	9 1/2	10 3/4	1/4 x 1/8 x 2 3/8	3 5/8	11/16	18 1/8	2 5/8	6 1/8	5 1/2
1/2	*	5 3/8	8 3/8	4	5 1/2	17 1/2	16 1/4	4 7/8	3 1/2	3/4	1 7/8	*	4 3/8	3 1/2	*	7/8	2 1/4	3 1/8	8 1/4	9 3/4	3/16 x 3/32 x 1 5/8	2 3/8	1 15/16	16 1/4	*	5 1/2	*

Size	AF	AG	AJ	AK	AP	AS	AT	BF	BG	BH	BJ	BK	BL	BM	BP	BQ	BR	CF	CG	CH	CK	CL	CM	ZA	ZB	ZC
5	29/32	28	13 1/2	.630	1/4-20 Set Screw	1 13/16	8	37 3/16	2 1/8	37	1 3/16	1/2 x 1/4 x 4 1/4	1 1/16	1 1/8	46 3/16	34 13/16	4 1/2	6 5/8	2 1/2	7 13/16	5/8-11	3 1/2	11 11/16	11 3/16	4 5/8	1 1/8
4	11/16	23	10 1/2	.630		1 5/8	6 1/2	32 11/32	1 3/4	32	1 7/32	1/2 x 1/4 x 4	1	1	40 5/8	30	4 9/32	5 1/4	2 5/32	6 1/4	1/2-13	3	10	8 1/4	4 5/32	1
3	17/32	18 5/8	9	.551		1 1/2	5 1/8	26 7/16	1 3/8	26 1/4	1 3/16	5/16 x 5/32 x 3 1/2	15/16	5/8	33 13/16	24 5/16	3 7/8	3 1/2	1 1/2	5 1/16	1/2-13	2 1/2	8 13/16	8	3 1/2	1
2	17/32	15 3/4	7 3/4	.551		1 3/8	4 5/16	23 3/8	1 3/8	23 1/16	7/8	5/16 x 5/32 x 2 3/4	13/16	13/16	29 1/8	21 1/2	3	2 9/32	1 1/4	4 3/16	1/2-13	2 1/32	6 27/32	6 13/16	2 1/2	3/4
1	17/32	11 3/4	4 7/8	.394		1 9/16	3 1/4	18 7/16	1 1/8	18 1/4	3/4	1/4 x 1/8 x 2 5/8	5/8	5/8	23 9/16	17	2 3/4	2	1 9/32	3	1/2-13	2	5 3/8	5 3/8	2 1/2	5/8
1/2	17/32	*	*	.375		1 1/8	2 3/4	14 1/2	7/8	12 5/16	1 9/16	3/16 x 3/32 x 2	11/16	3/4	18 3/8	11	2	2 3/8	*	2 15/16	1/2-13	1 9/16	4 13/16	4 7/8	1 1/4	5/8

FIGURE 10 OUTLINE DIMENSIONS — STYLE I

OUTLINE DIMENSIONS — TYPE A STYLE II HDD TRANSMISSIONS



NOTES:
1) Shaft Tolerance + .0000 – .0005
2) Other Dimensions Shown ± 1/16
3) (*) Feet Integrally cast on Model 1/2 HDD-89
4) For shaft position see assembly arrangements on page 11

Size	A	B	C	D	F	G	H	J	M	N	P	Q	R	V	W	Y	AA	AD	AF	AG	AJ	AL	AM	AN	AQ
5	39 1/2	10 5/8	19 13/16	10 7/16	39 1/2	37 1/4	19 5/8	17 1/2	8 15/16	9 3/8	6	7/8	1 3/8	20 1/8	22 3/8	7 3/8	41	13 1/4	29/32	28	13 1/2	4 1/2	2 1/4	16 1/16	2 3/16
4	32 1/4	8 1/2	16	8 1/4	32	30	16	14	7 1/4	7 3/4	6	5/8	7/8	14 1/2	16 1/2	6	33 1/4	10 5/8	11/16	23	10 1/2	4	1 3/4	13	1 7/8
3	26 3/8	7 5/8	13 3/8	7	26 3/4	25 1/2	14 1/8	12 1/4	6	6 3/8	6	1/2	7/8	14 7/8	16 1/8	5	27 3/8	9	17/32	18 5/8	9	3 7/16	1 1/2	10 15/32	3/4
2	22 3/4	6 1/4	11 11/16	6 3/16	22 3/4	21 1/8	12 1/4	10 5/8	5 3/16	5 1/2	3 1/2	1/2	7/8	12	13 5/8	4 3/8	23 3/4	8 1/16	17/32	15 3/4	7 3/4	2 3/4	1 1/4	8 23/32	1 3/8
1	17 1/2	4 7/8	8 3/4	4 1/2	17 1/2	16 1/4	8 3/4	7 1/2	3 7/8	4 1/4	3 1/2	1/2	9/16	9 1/2	10 3/4	3 5/8	18 1/8	6 1/8	17/32	11 3/4	4 7/8	2 7/16	1 1/8	6 1/2	15/16
1/2	*	5 3/8	8 3/8	4	17 3/4	16 1/4	4 7/8	3 1/2	*	4 3/8	3 1/2	*	7/8	8 1/4	9 3/8	2 3/4	16 1/4	5 1/2	17/32	*	*	2	1	5 7/8	1 9/32

Size	AR	AT	AZ	BB	BG	BH	BJ	BK	BL	BM	BQ	BR	BU	BV	BY	CF	CG	CH	CK	AK	ZA	ZB	ZC
5	1/2 x 1/4 x 4 3/8	8	7 5/16	18 5/8	2 1/8	37	1 3/16	1/2 x 1/4 x 4 1/4	1 1/16	1 1/8	34 13/16	4 1/2		43 5/16	52 5/16	6 5/8	2 1/2	7 13/16	5/8-11	.630	11 3/16	4 5/8	1 1/8
4	3/8 x 3/16 x 3 5/8	6 1/2	6 1/8	15	1 3/4	32	1 7/32	1/2 x 1/4 x 4	1	1	30	4 9/32		37 11/32	45 5/8	5 1/4	2 5/32	6 1/4	1/2-13	.630	8 1/4	4 5/32	1
3	3/8 x 3/16 x 3 3/16	5 1/8	5 7/16	12 3/4	1 3/8	26 1/4	1 3/16	5/16 x 5/32 x 3 1/2	15/16	5/8	24 5/16	3 7/8		30 15/16	38 1/4	3 1/2	1 1/2	5 1/16	1/2-13	.551	8	3 1/2	1
2	1/4 x 1/8 x 2 5/8	4 5/16	5 9/16	10 9/16	1 3/8	23 1/16	7/8	5/16 x 5/32 x 2 3/4	13/16	13/16	21 1/2	3		27 15/16	33 11/16	2 9/32	1 1/4	4 3/16	1/2-13	.551	6 13/16	2 1/2	3/4
1	1/4 x 1/8 x 2 3/8	3 1/4	4 5/8	8 1/8	1 1/8	18 1/4	3/4	1/4 x 1/8 x 2 5/8	5/8	5/8	17	2 3/4		22 3/8	27 9/16	2	1 9/32	3	1/2-13	.394	5 3/8	2 1/2	1 9/32
1/2	1/4 x 1/8 x 1 7/8	2 3/4	5 3/4	8 1/8	7/8	12 5/16	1 9/16	3/16 x 3/32 x 2	11/16	3/4	11	2		18 5/16	22 5/16	2 3/8	*	2 15/16	1/2-13	.375	4 7/8	1 1/4	5/8

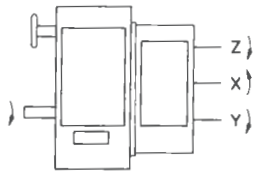
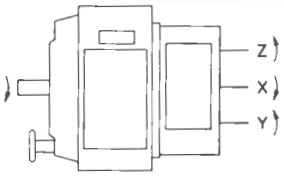
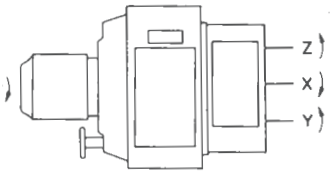
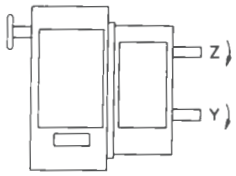
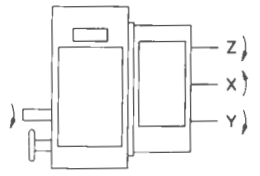
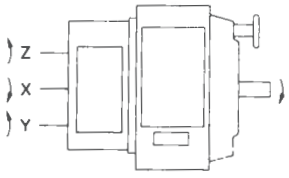
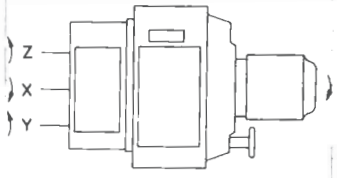
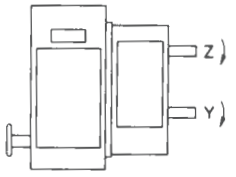
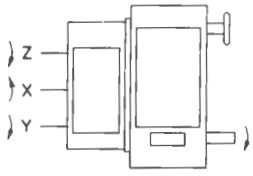
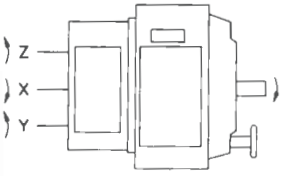
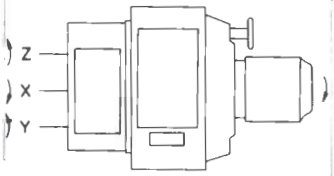
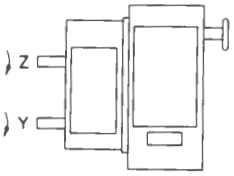
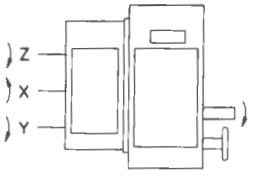
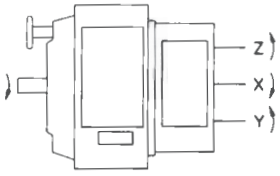
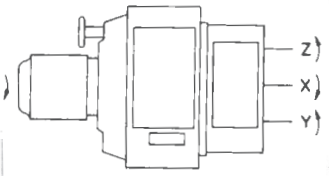
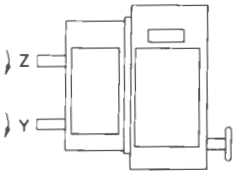
FIGURE 11 OUTLINE DIMENSIONS — STYLE II

TRANSMISSION STYLES

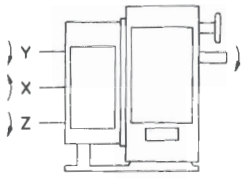
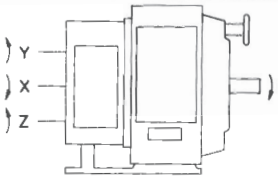
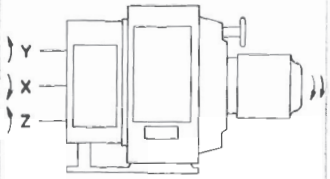
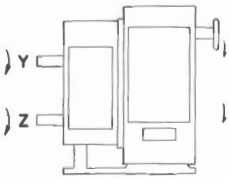
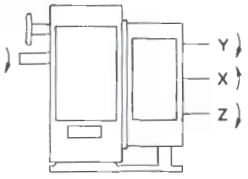
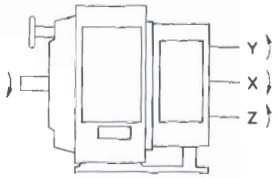
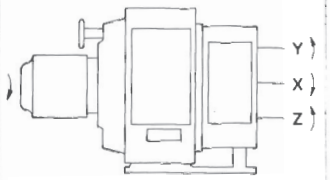
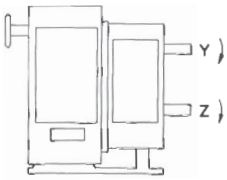
TYPE "A"
Output @ Y, X or Z
See Model Number in rating table.

TYPE "B"
Input @ Y, Output @ Z

Horizontal Units (Top View)

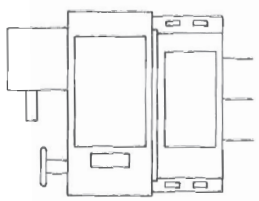
STYLE I	STYLE II	STYLE III	STYLE I
 ASSEMBLY A	 ASSEMBLY 5	 ASSEMBLY 1	 ASSEMBLY A
 ASSEMBLY B	 ASSEMBLY 6	 ASSEMBLY 2	 ASSEMBLY B
 ASSEMBLY C	 ASSEMBLY 7	 ASSEMBLY 3	 ASSEMBLY C
 ASSEMBLY D	 ASSEMBLY 8	 ASSEMBLY 4	 ASSEMBLY D

Vertical Units (Side View)

STYLE I	STYLE II	STYLE III	STYLE I
 ASSEMBLY B	 ASSEMBLY 5	 ASSEMBLY 1	 ASSEMBLY B
 ASSEMBLY D	 ASSEMBLY 7	 ASSEMBLY 3	 ASSEMBLY D

Right Angle
Input or Output

Consult
Factory
for Details.



OPTIONS

The Specon Transmission is normally supplied with the standard manual control. Other types of control, such as remote, vernier, remote vernier, lever, electrical, pneumatic and hydraulic are available.

MANUAL CONTROL

Specon transmissions are normally supplied with a hand knob on the adjusting screw for normal manual adjustment. The adjusting knob includes an indicator mechanism which accurately indicates turns and parts of turns of the adjusting screw. Output speed setting is a definite function of adjusting screw turns and thus the handwheel indicator accurately reflects output speed setting or ratio.

MECHANICAL REMOTE CONTROL

Mechanical Remote Control is an indicator and handwheel assembly which can be remotely mounted from the transmission. It can be connected by roller chain or flexible shafting to the adjusting screw of the transmission. Thus normal manual control can be achieved from a remote position.

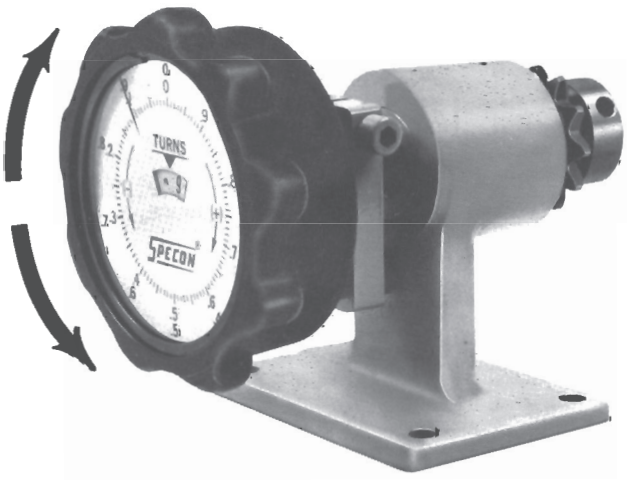


FIGURE 12

VERNIER CONTROL

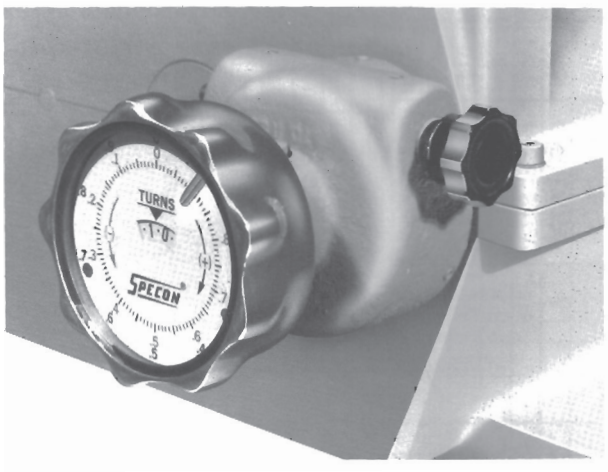


FIGURE 13

Vernier Control consists of a small worm and worm gear package connected to the adjusting screw which permits finer adjusting of output speed per turn of the adjusting hand knob.

The worm gear ratio can be provided either in a 7½:1 or a 30:1 ratio. The vernier control package contains both a rough and fine adjusting handwheel. This control can be provided as an integral part of the Specon transmission, in which case it is located at the adjusting screw position. The same accurate indicating handwheel as is used on the remote control can be used on the course adjusting shaft of the vernier control. Thus a fine degree of repeatability can be achieved.

REMOTE VERNIER CONTROL

The Remote Vernier control accessory utilizes the same construction and offers the same features as the integral vernier control. It can, however, be remotely mounted from the transmission and connected to the adjusting screw of the transmission by roller chain or flexible shafting. The remote vernier control also has a coarse adjusting handwheel and a fine adjusting handwheel.

PRELOADING

Specon transmissions can, as an option, be provided with preloaded control levers. This preloading feature incorporates a tension or compression spring between the control levers of the transmission which preloads the control mechanism and reduces the play resulting from manufacturing and assembly tolerances.

The overall effect of this feature is to improve the operating accuracy of the transmission under constant load conditions.

When specifying preloading, it is necessary to also define the position of the control screw relative to the constant speed or variable speed shaft and whether the load is a normal driving or overhauling load.

ELECTRIC REMOTE CONTROL

Electric Remote Control can also be made available on the Specon Transmission. The remote control consists of a reversible gear head motor with a very slow output speed.

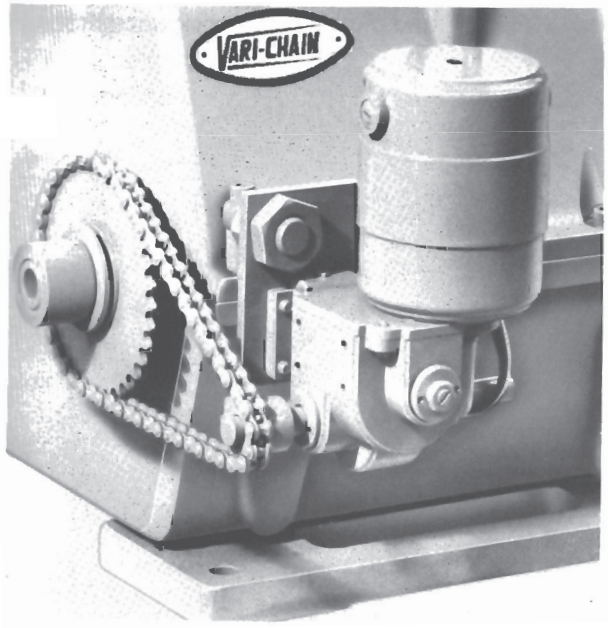
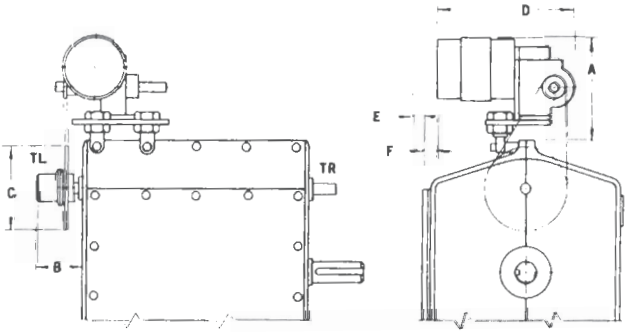


FIGURE 14



Unit Size	A	B	C	D	E	F
0	5 7/16	1 7/8	3 15/16	7 3/8	1 1/2	
1/2	5 3/8	1 7/8	3 15/16	7 3/8	7/16	
1	5 3/8	2 1/2	3 15/16	7 3/8	7/16	
2	5 3/8	2 1/2	4 33/64	7 3/8		3/4
3	5 1/4	2 1/2	4 33/64	7 3/8		1 3/8
4	6 3/4	2 5/8	4 33/64	13 13/16	2 1/8	
5	6 3/4	2 5/8	4 33/64	13 13/16	5/8	

FIGURE 15

The output shaft of the gear head motor is connected to the adjusting screw with roller chain. A mechanical slip clutch is included to protect the control and motor when the control levers in the unit have reached the end of travel. Electric service can be 115 or 230V A/C or D/C single phase or 230V to 575V multiphase A/C.

PNEUMATIC CONTROL

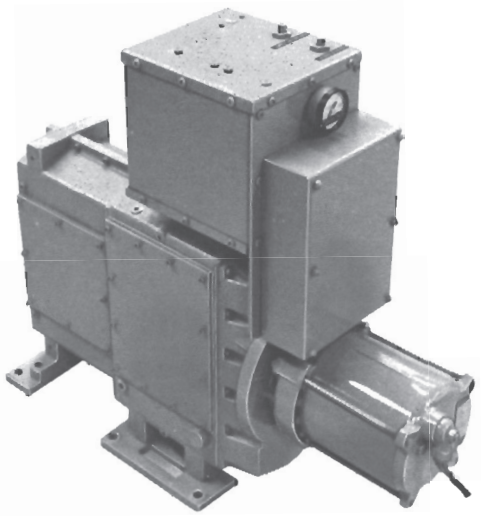


FIGURE 16

Recommended for operation in an explosive atmosphere or on automatic control loops or where rapid response is desirable. Three types of pneumatic controls are available:

1. Reversible air motor with pushbutton station for remote operator control. By appropriate use of pneumatic relays, remote control from several hundred feet can be achieved.

2. Design consisting of an air motor and appropriate interconnected pressure regulators, relays and valves requiring standard signal pressures such as 3-15 PSI to control through full speed range of transmission.

3. Pneumatic cylinder used with right angle lever control for continuous speed range changes. Signal pressure 3-15 PSI.

Systems 2 & 3 are suitable for automatic control systems requiring only 3-15 PSI signal pressure from a process controlling element.

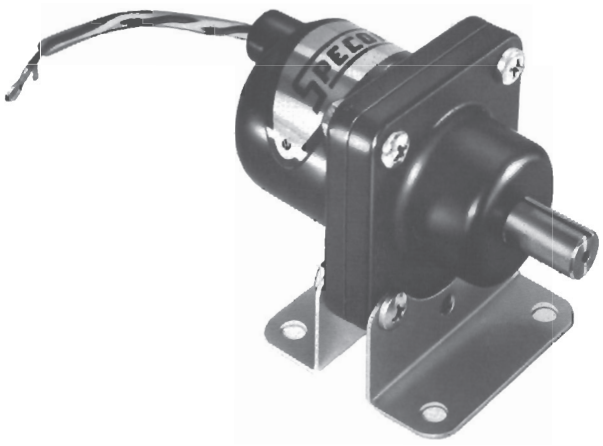


FIGURE 17

The Specon tachometer-generator and readout system is designed for industrial applications. The panel mount indicator may be calibrated in RPM, FPM, or other units. Typical ranges available are 0-100, 0-250, 0-500, 0-1000 and 0-2000 RPM with a calibrated system accuracy within 1% of full scale reading. The generator is enclosed in a weatherproof housing with a ½" diameter output shaft extension, bearing mounted and designed for industrial applications.

The generator may be furnished with a bracket for remote mounting or direct flange mounted units are also available when ordered as part of a Specon variable speed transmission.

ORDERING INFORMATION

ORDERING

Contact the factory for your application. The information required to select a unit is:
1 – Exact input speed
2 – Output speed
3 – Input and output shaft location
4 – Control handwheel location
5 – Service factor

When ordering, specify: Size and designation, type, style, assembly, type of mounting, speed requirements, draw range, and controls required.(For Style III units specify motor HP and motor electrical characteristics.) For example, to order a Style I:

> Specon 5HDDZ-89 Type A Style I, Assembly A, Horizontal Input speed 720 RPM
> Output speed — 715.5-722.3 RPM, 0.94% draw.

Equipped with — (List control required).

CANDY CONTROLS®

ISO 2015 Certified

MECHANICAL & ELECTRO – MECHANICAL POWER TRANSMISSION EQUIPMENT

SPECON

Litho in USA
Rev. B 11-98