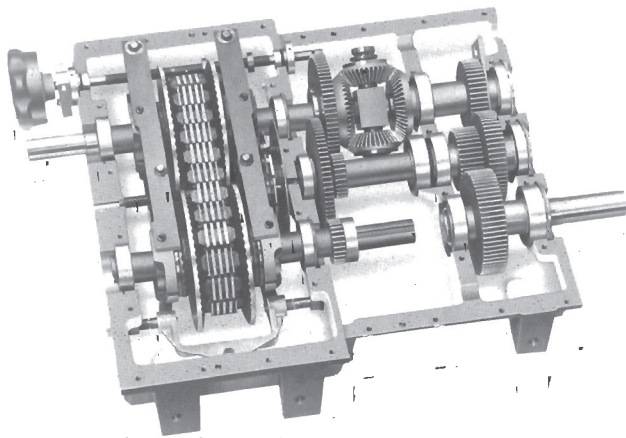




DIFFERENTIAL DRAW TRANSMISSIONS


REPAIR ONLY

APPLICATIONS

The Specon Mechanical Differential Draw (MDD) Transmission embodies the differential draw principles first conceived and put into limited practice in the 19th century. This concept results in extremely accurate control of speed by compressing the speed range of a relatively wide mechanical variable speed device by appropriate connection to differential gearing. Inherent operating accuracies over 1000 times those of the variable element are attainable. This time-proven concept is combined with the service-proven components of the Specon MDD Transmissions to produce extremely accurate and reliable units with a long service life for:

printing presses, paper machinery, film processing, paper cutoff, synthetic fiber, alternator drives, textile machinery, metering pumps and other Trim Speed applications requiring inherently high operating accuracy.

FEATURES

- # Equipped with automatic chain tensioner
- # Requires shutdown only to change oil or replace chain
- # Optional Integral correcting differential available installed in series with draw reduction gearing
- # 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
- # Split Housing Construction

BENEFITS

- # Maintains proper chain tension through entire chain life. Shutdown not required to check or adjust tension
- # Reduces down time
- # Permits instantaneous phase adjustment of output shaft. Correction can be made intermittently or continuously by manual or other means.
- # 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
- # Facilitates major maintenance

SPECIFICATIONS

Capacities and Ratings

Specon MDD Transmissions are available with an infinite number of output speed ranges. The selection tables list power and speed ranges for the various size units available with output speed or draw range nominally expressed in percent. Draw ranges may be used in various ways: for example, a 10% range may be expressed as ($\pm 5\%$) (-2% to $+8\%$), ($+4\%$ to -6%) or any combination of extremes having the same total percentage range. The tables show standard draw ranges. For example: size 1 shows 3, 4, 5, $7\frac{1}{2}$, 10, 15 and 20% draw. Any specific draw range, whether below the 5% shown or above the 20%, can be supplied.

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 MDDY, MDDX, and MDDZ refer to the shaft positions. (See transmission style drawings on page 11.)

Units with output shafts at position Y have no output gearing and the output shaft is directly extended from the differential output gear. This unit is designated as an MDDY 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 MDDX. Units with the output shaft at position "Z" have double stage output gearing and are referred to as MDDZ 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.

SPEED ADJUSTMENT

The Specon MDD Transmission is normally provided with a manual handwheel control. The number of control handwheel turns required to adjust the transmission through its entire speed range is listed in the selection tables. Because of the narrow speed range of the MDD unit the ratio of handwheel turns versus output speed in RPMs is ideal. For instance an MDD transmission with a range of 5% when operating at 1000 RPM will only change speed by an **average** of 4 to 5 RPMs for a complete turn of the control handwheel.

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 listed in the table 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. Refer to pages 18 to 20 for additional details on control media.

OPERATING

The Specon MDD 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 and the narrower the range the less power that is transmitted through the chain.

The inherent output speed regulation of the MDD is further enhanced by the differential draw phenomenon through the bevel gear differential. While the variation within the variable element may be as much as 1% the actual variation at the output of the differential may be only 1/50th of that or .020%. This ratio of relative regulation is also a function of the speed range incorporated into the transmission.

OUTPUT SPEED REGULATION

Speed Range %	Max. Speed Setting %	Min. Speed Setting %
2	.005	.025
5	.01	.07
10	.02	.17
20	.05	.5

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 with these curves.

It is noted that the operating speed regulation is greater at maximum output draw or speed setting than it is at minimum draw setting. If best regulation is required at minimum output speed an alternate connection to the differential can be made to provide it.

FIGURE 1
OUTPUT SPEED REGULATION

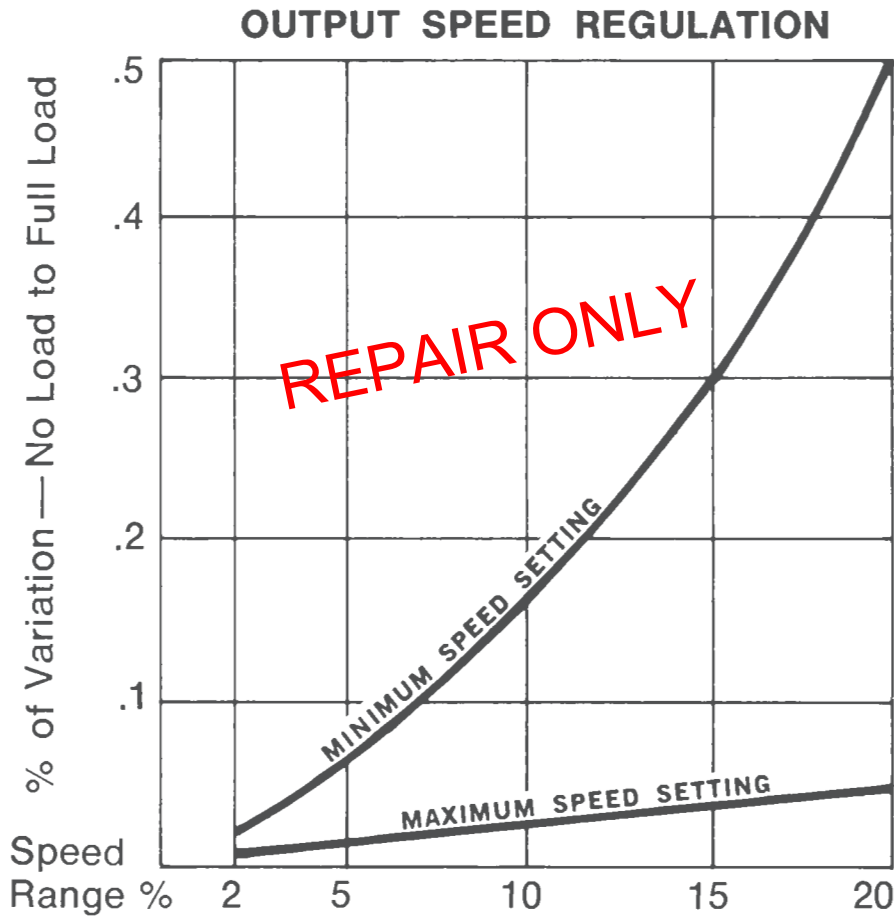


FIGURE 2
SPEED REGULATION CURVES

TORQUE CAPACITY

Specon MDD Transmissions are rated for constant torque capacity throughout the range of draw adjustment. The output torque ratings remain unchanged if the input speeds are 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

$$*T = \frac{HP \ 63,000}{RPM}$$

*T in Pound-inches

(*) LIMITING TORQUE CAPACITY

UNIT SIZE	Output TQ. Range (LB—IN)		RPM Range
	Minimum – At Highest RPM Range Shown in Tabulation	Maximum – Mechanical Limit at RPM Ranges Shown and Slower	
1/2	100	1500	181-187
1	200	2400	203-233
2	375	3000	304-312
3	600	4100	288-345
4	1330	7200	236-246
5	1995	8900	233-243
6	1870	12,500	360-378

**FIGURE 3
LIMITING TORQUE CAPACITY**

The standard Specon draw transmission model suffix — 66, 71 and 84 is furnished with the Specon Vari-Chain transmission integrally mounted to the differential housing.

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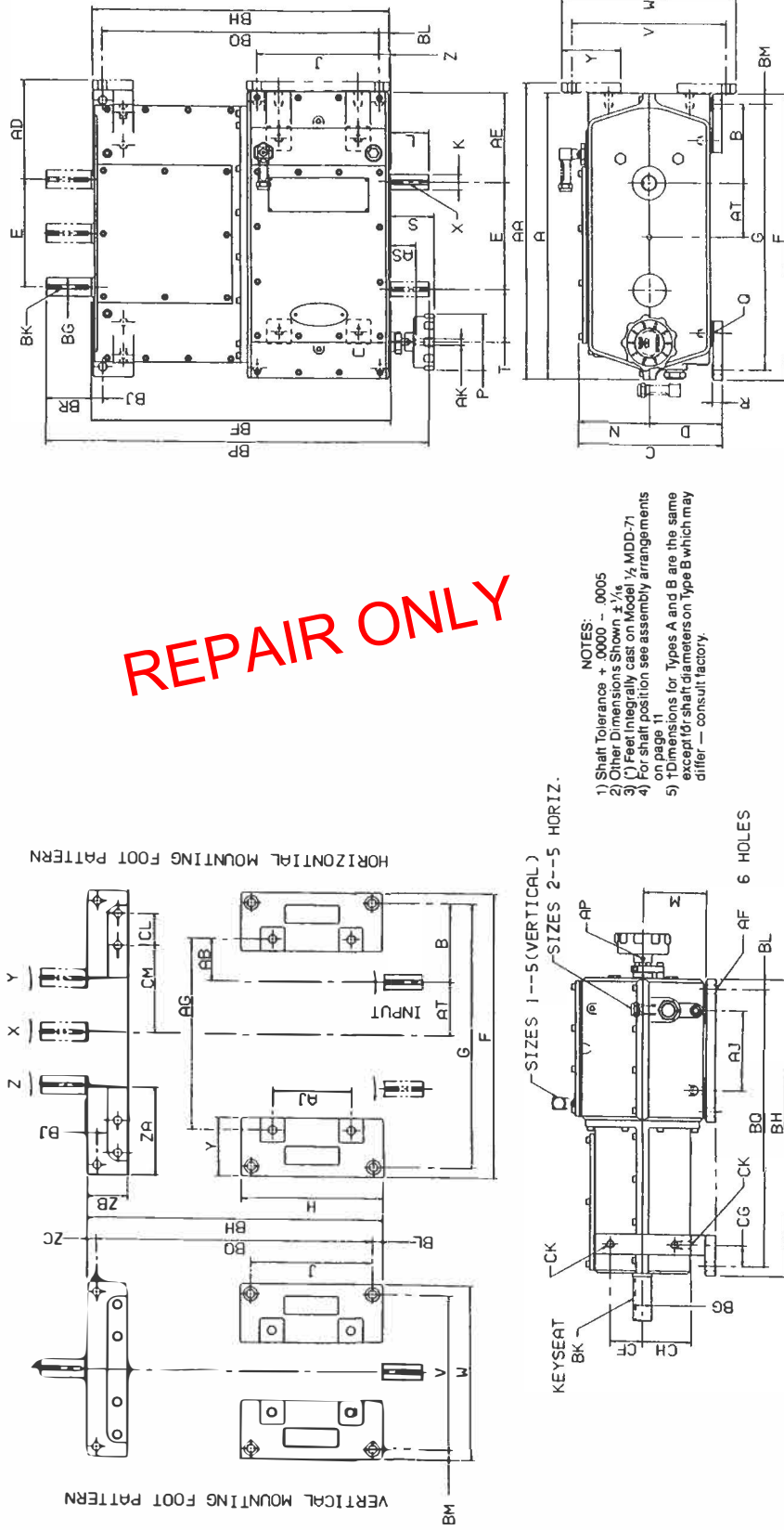
The speed used in this determination should be the maximum of the draw range in the particular application. In no case, however, should the torque capacity exceed that shown in the accompanying table, Figure 3.

Note: For some speed ranges, all combinations of shaft position may not be available. Consult factory.

OUTLINE DIMENSIONS - TYPE A AND TYPE B - STYLE MDD DRAW TRANSMISSIONS

OUTLINE DIMENSIONS

REPAIR ONLY



- NOTES:
- 1) Shaft Tolerance + .0000 - .0005
 - 2) Other Dimensions Shown $\pm 1/16$
 - 3) (*) Feet Integrally cast on Model $1/2$ MDD-71
 - 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.

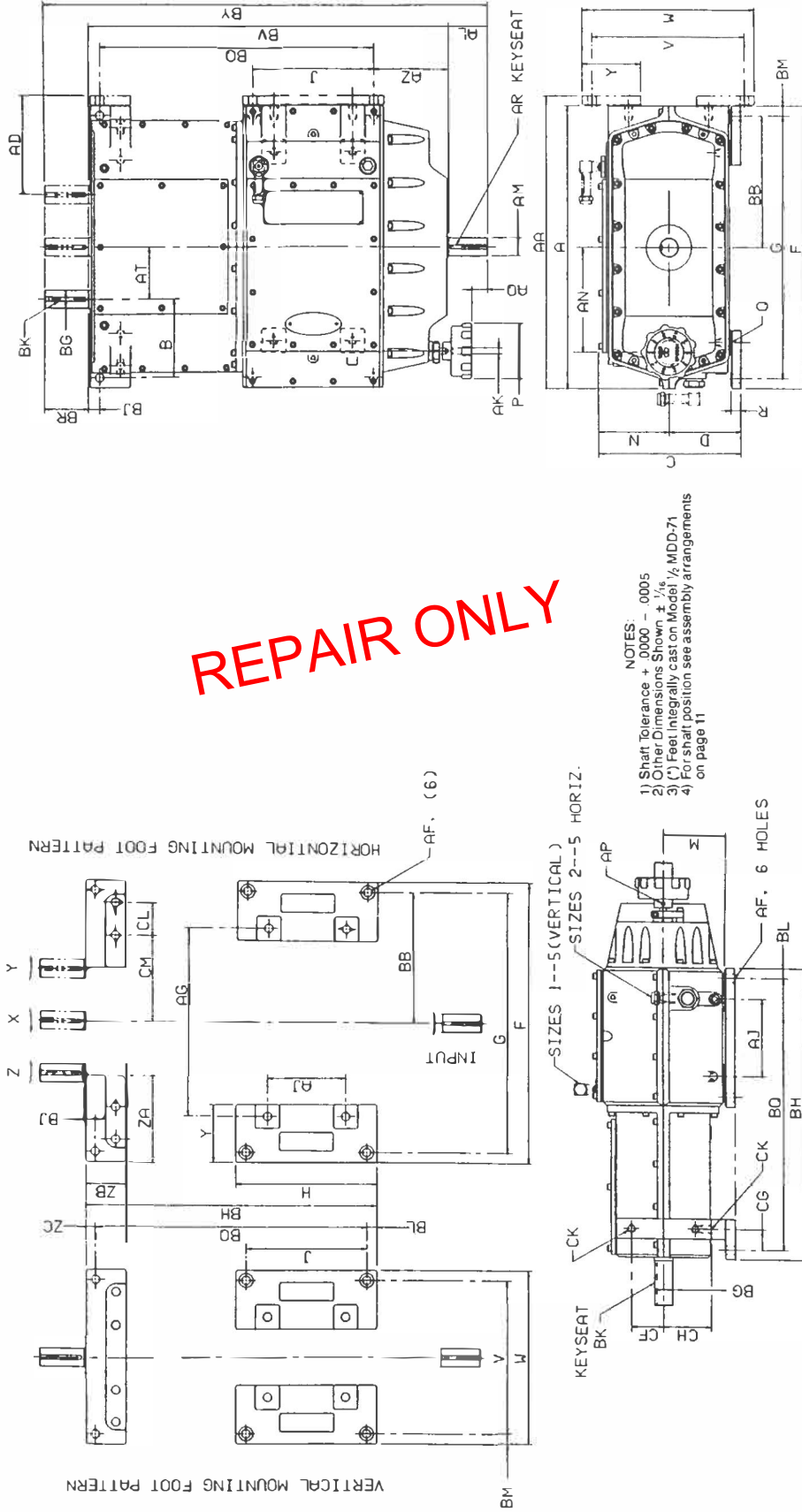
Drawing No. DSK 1226

Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	V	W	X	Y	Z	AA	AB	AD	AE		
3	26 ³ / ₈	7 ⁵ / ₈	13 ³ / ₈	7	10 ¹ / ₄	26 ³ / ₄	25 ¹ / ₂	14 ¹ / ₈	12 ¹ / ₄	15 ¹ / ₈	3 ¹ / ₂	6	6 ⁵ / ₈	6	1 ¹ / ₂ -13	1	3 ⁵ / ₈	5 ³ / ₈	14 ⁷ / ₈	16 ¹ / ₈	5 ¹ / ₈	5 ¹ / ₁₆	X 5 ³ / ₃₂	X 3 ¹ / ₂	5	15 ¹ / ₈	27 ³ / ₈	43 ³ / ₈	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	2 ³ / ₄	5 ³ / ₈	5 ¹ / ₈	3 ¹ / ₂	1 ¹ / ₂ -13	1	2 ⁵ / ₈	4 ¹ / ₃₂	12	13 ⁵ / ₈	1 ¹ / ₄	X 1 ¹ / ₈	X 2 ⁵ / ₈	4 ³ / ₈	1	23 ³ / ₄	3 ⁹ / ₈	8 ¹ / ₈	7 ¹ / ₈
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	1 ⁵ / ₈	2 ³ / ₈	3 ¹ / ₂	3 ⁷ / ₈	4 ³ / ₈	3 ¹ / ₂	1 ¹ / ₂ -13	5 ⁷ / ₈	2 ¹ / ₁₆	3 ¹ / ₄	9 ¹ / ₂	10 ³ / ₄	1 ¹ / ₄	X 1 ¹ / ₈	X 2 ³ / ₈	3 ⁵ / ₈	1 ¹ / 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 ¹ / ₄	1 ⁷ / ₈	*	*	4 ³ / ₈	3 ¹ / ₂	*	7 ⁷ / ₈	2 ¹ / ₄	3 ¹ / ₈	8 ¹ / ₄	9 ³ / ₄	3 ¹ / ₁₆	X 3 ¹ / ₃₂	X 1 ⁵ / ₈	2 ³ / ₈	1 ¹⁵ / ₁₆	16 ¹ / ₄	*	5 ¹ / ₂	*
Size	AF	AG	AJ	AK	AS	AT	AW	BH	BI	BJ	BK	BL	BM	BN	BP	BQ	BR	BS	BT	BV	BW	CH	CK	CL	CM	CA	ZB	ZC		
3	17 ³ / 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 ¹ / ₁₆	X 5 ³ / ₃₂	X 3 ¹ / ₂	15 ¹ / ₁₆	5 ⁷ / ₈	33 ³ / ₁₆	24 ⁵ / ₁₆	3 ⁷ / ₈	3 ¹ / ₂	1 ¹ / ₂	5 ¹ / ₁₆	1 ² / ₂ -13	2 ¹ / ₂	8 ³ / ₁₆	8	3 ¹ / ₂	1			
2	17 ³ / ₃₂	15 ³ / ₄	7 ³ / ₄	.551	1 ³ / ₈	4 ⁵ / ₁₆	23 ³ / ₈	1 ³ / ₈	23 ¹ / ₁₆	7 ⁷ / ₈	5 ¹ / ₁₆	X 5 ³ / ₃₂	X 2 ³ / ₄	1 ³ / ₁₆	1 ³ / ₁₆	29 ⁷ / ₈	21 ¹ / ₂	3	2 ⁵ / ₈	2 ¹ / ₂	3 ¹ / ₃₂	1 ¹ / ₄	4 ³ / ₁₆	1 ² / ₂ -13	2 ¹ / ₃₂	6 ²⁷ / ₃₂	6 ³ / ₁₆	2 ¹ / ₂	3 ⁴ / ₄	
1	17 ³ / 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 / ₄	1 ¹ / ₄	X 1 ¹ / ₈	X 2 ⁵ / ₈	5 ⁷ / ₈	5 ⁷ / ₈	23 ⁹ / ₁₆	17	2 ³ / ₄	2	1 ⁹ / ₃₂	3	1 ² / ₂ -13	2	5 ³ / ₈	5 ³ / ₈	2 ¹ / ₂	2 ¹ / ₂	5 ⁸	5 ⁸	
1/2	17 ³ / ₃₂	*	*	.375	1 ⁷ / ₈	2 ³ / ₄	14 ¹ / ₂	7 ⁷ / ₈	12 ⁵ / ₁₆	1 ⁹ / ₁₆	3 ⁷ / ₁₆	X 3 ¹ / ₃₂	X 2	1 ¹ / ₁₆	3 ⁴ / ₄	18 ³ / ₈	11	2	2 ³ / ₈	2	2 ³ / ₈	*	2 ¹⁵ / ₁₆	1 ² / ₂ -13	1 ⁹ / ₁₆	4 ¹³ / ₁₆	4 ⁷ / ₈	1 ¹ / ₄	5 ⁸	

FIGURE 4 OUTLINE DIMENSIONS — STYLE I

OUTLINE DIMENSIONS

OUTLINE DIMENSIONS — TYPE A STYLE II MDD DRAW TRANSMISSIONS



REPAIR ONLY

- NOTES:
- 1) Shaft Tolerance + .0000 - .0005
 - 2) Other Dimensions Shown + 1/16" MDD.71
 - 3) (*) Feet integrally cast on Model 1/4 MDD.71
 - 4) For shaft position see assembly arrangements on page 11

Drawing No. DSK 1227

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	AN	AQ
3	26 ³ / ₈	7 ⁵ / ₈	13 ⁹ / ₁₆	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 ¹ / ₃₂	18 ⁵ / ₈	9	37 ¹ / ₁₆	1 ¹ / ₂	10 ¹⁵ / ₃₂	3/4	
2	22 ³ / ₄	6 ¹ / ₄	11 ⁷ / ₈	6 ³ / ₈	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 ¹ / 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 ⁷ / ₈	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 ¹ / ₁₆	9 ¹ / ₂	10 ³ / ₄	3 ⁵ / ₈	18 ¹ / ₈	6 ¹ / ₈	17 ¹ / ₃₂	11 ³ / ₄	4 ⁷ / ₈	2 ⁷ / ₁₆	1 ¹ / ₈	6 ¹ / ₂	15 ¹ / 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 ¹ / 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	CK	CH	AK	ZA	ZB	ZC	
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 ¹ / ₁₆	5/8	24 ⁵ / ₁₆	3 ⁷ / ₈	30 ¹⁵ / ₁₆	38 ¹ / ₄	3 ¹ / ₂	3 ¹ / ₂	1 ¹ / ₂	5 ¹ / ₁₆	1/2-13	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 ¹ / ₄	13 ¹ / ₁₆	13 ¹ / ₁₆	21 ¹ / ₂	3	27 ¹⁵ / ₁₆	33 ¹¹ / ₁₆	2 ⁹ / ₃₂	1 ¹ / ₄	4 ³ / ₁₆	1/2-13	1/2-13	.551	6 ¹³ / ₁₆	2 ¹ / ₂	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	1/2-13	.394	5 ³ / ₈	2 ¹ / ₂	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	1 ¹ / ₁₆	3/4	11	2	18 ⁵ / ₁₆	22 ⁵ / ₁₆	2 ³ / ₈	*	2 ¹⁵ / ₁₆	1/2-13	1/2-13	.375	4 ⁷ / ₈	1 ¹ / ₄	1 ¹ / ₄	5/8		

FIGURE 5 OUTLINE DIMENSIONS — STYLE II

PRINCIPLES OF OPERATION

GENERAL DESCRIPTION

The basic components of the Specon Draw Transmission are a 4:1 infinitely variable all metal chain and pulley combination and a bevel gear differential assembly. The input to the transmission drives the constant speed pulleys of the variable element and one member of the differential. By controlling the speed of a second element of the differential through reduction gearing from the adjustable 4:1 shaft of the variable chain connection, the third or output gear of the differential is controlled within a highly compressed speed range.

The output speed range is a function of the reduction incorporated between the variable speed shaft of the variable element and the variable speed differential gear. The higher the reduction the narrower the speed range and, consequently, the greater the accuracy.

The Specon 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 exactly the application requirements.

The extreme accuracy and fine control of the Specon MDD transmissions make them excellent in applications such as web control on printing presses, cellophane casting machines, film processing equipment and paper making machines, alternator drives, glass drawing machines, conveyor synchronizing drives, fiber winding and drawing machinery, shingle cut-off machinery, metering pumps and many others.

Three basic types of Specon Draw Transmissions are available.

Type A is similar to the cross section view shown in Fig. 6. Input and output shafts are always on opposite sides.

CROSS SECTIONS

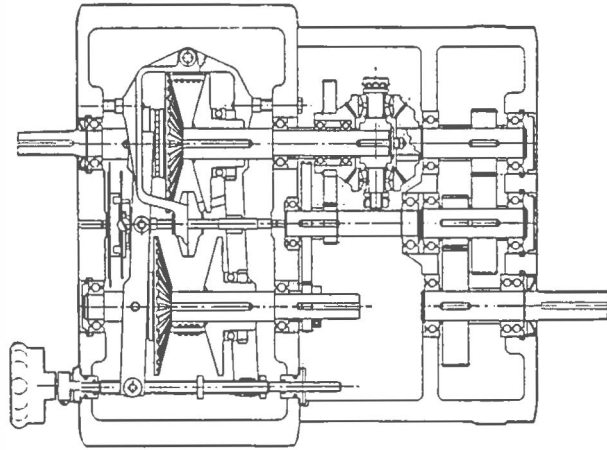


FIGURE 6
CROSS SECTION OF TYPICAL TYPE A
DIFFERENTIAL DRAW TRANSMISSION

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 7)

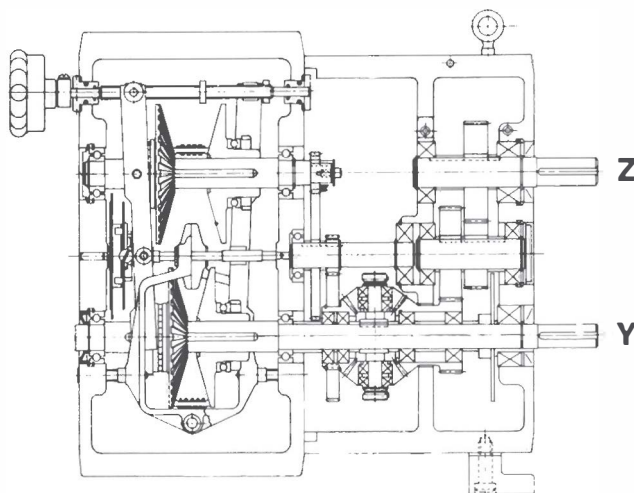
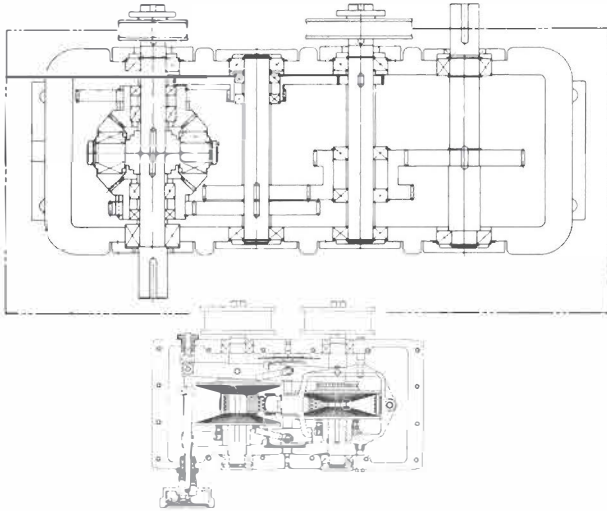


FIGURE 7
TYPE B DIFFERENTIAL DRAW TRANSMISSION

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Type C units can be supplied in a multiplicity of arrangements in that the variable speed element and the differential gearing elements are contained in separate housings with external connections between the shafting. This type of unit is supplied as a “piggy-back” arrangement with the input and output shafts on the same or opposite sides as desired. (See Figure 8)



**FIGURE 8
TYPE C DIFFERENTIAL DRAW TRANSMISSION**

Type A and Type C draw transmissions are available with a built-in auxiliary differential (Figure 8A) for phase shifting and register control applications. Speed and power ratings for the Type A versions are similar to those shown for the Type A MDDY or MDDX transmissions with the output shaft at position Y or position X. The correction shaft is always at the Z position.

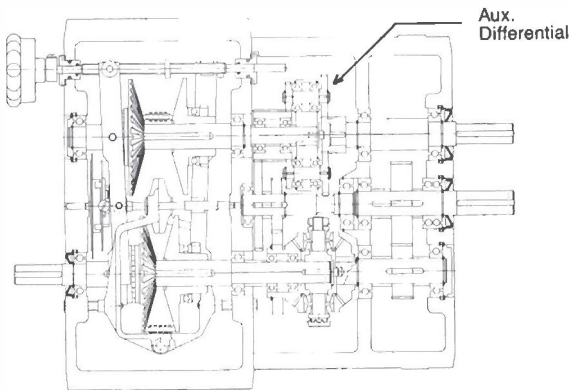


FIGURE 8A

Correction shaft rotation in one direction causes output to speed up while rotation in the opposite direction causes output shaft speed to decrease. The ratio of output shaft rotation to correction shaft rotation will be in the order of 10:1 but will vary as a function of the draw range and output speed specified. Consult the factory for the ratio after the draw range and output speed have been established.

In Type C transmissions, because of their versatility and the various configurations that may be incorporated into a transmission, the control shaft location is not fixed. Consult the factory for approval of a proposed position or for recommendations.

TORQUE MEASUREMENT AND CONTROL

The auxiliary differential which is incorporated into the Type A or Type C units may be used to measure output torque. The torque reflected at the control shaft is directly related to output torque, and by utilizing a torque arm and a force transducer, this torque may be indicated or recorded at the transmission or at a remote position.

With the incorporation of a feedback system to control the variable speed element, the output draw setting, and, consequently, torque flow where torque is a function of output speed, may be controlled.

The factory should be consulted regarding applications proposed for torque measuring or torque control systems.

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Following are examples of Style I Type A and B Transmissions. Where it is required that the input and output shafts are on the same side, the Type B transmission unit would be selected.

REPAIR ONLY

Style I Type A Assembly D
Output at Z

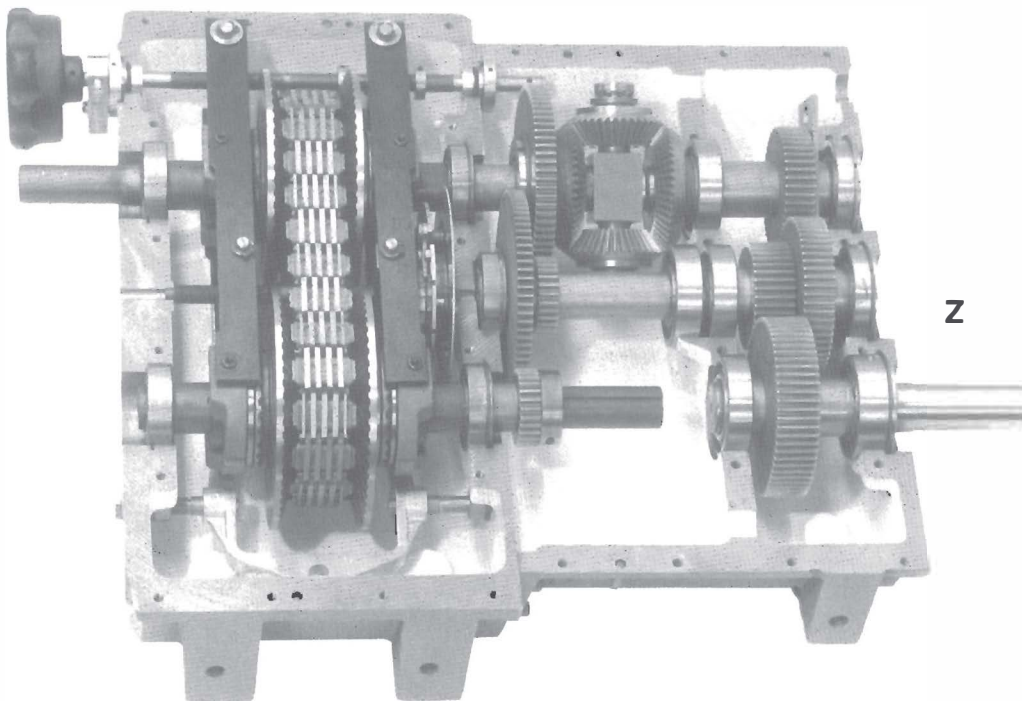
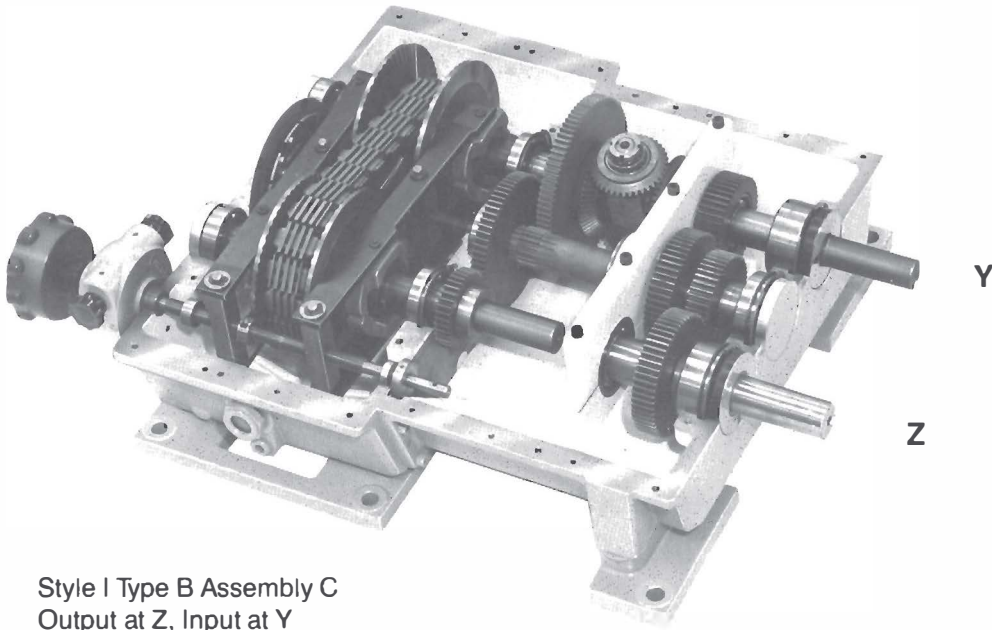


FIGURE 9
STYLE I TYPE A TRANSMISSION



Style I Type B Assembly C
Output at Z, Input at Y
(Input and output on same side)

FIGURE 10
STYLE I TYPE B TRANSMISSION

Style I rated input speed is shown in the various rating tables. For shaft rotation, see table on page 10.

Style II units, with enclosed input gearing, are available for input speeds higher than those listed, or for maximum output at lower input speeds. Style II units are also available for direct coupling to 1750 RPM driving motors. For shaft rotation, see table on page 10. For gear ratios available see Vari-Chain catalog 207.

Note: Unit Pictured Has
Auxiliary Differential
(Page 7)

REPAIR ONLY

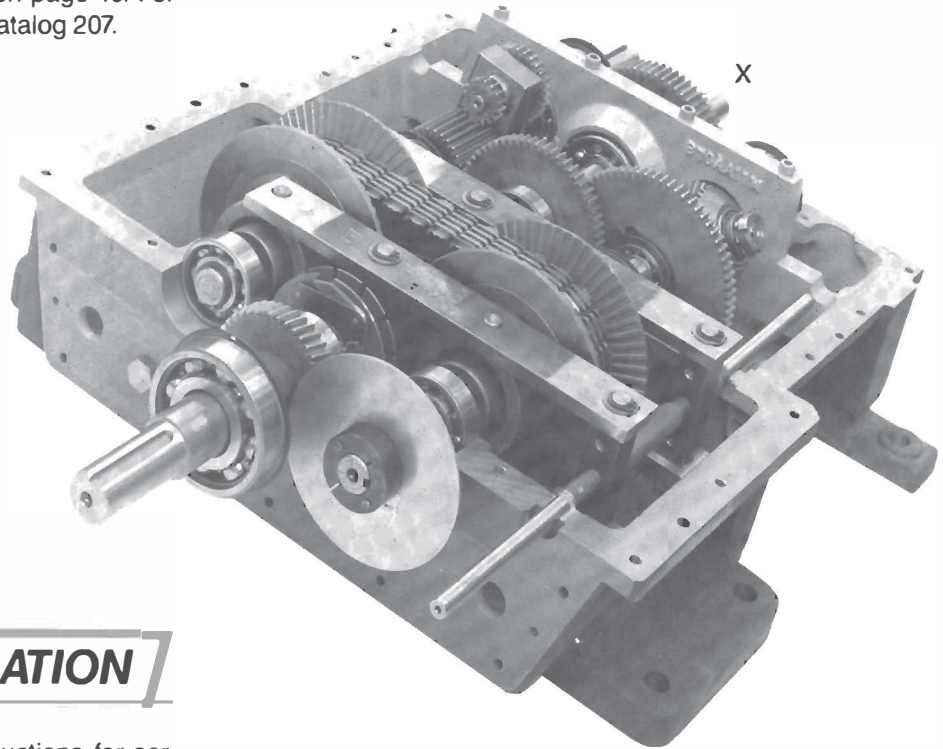


FIGURE 10A
Style II Type A Assembly 5
Output At X

SERVICE INFORMATION

A list of replacement parts and instructions for servicing the Differential Draw Transmission are available in the Installation, Operating and Maintenance Instructions Bulletin 201 IOM and 207 IOM.

SELECTION AND ORDERING INFORMATION

The accompanying tables are designed to simplify the steps necessary for selection of the Specon Mechanical Differential Draw Transmission required for any specific application within the power ranges shown. For other power outputs, consult the factory. To select a transmission, first, from the application, determine the type — whether Type A, B or C — the assembly configuration — referring to the configuration drawings. Follow the steps listed below, consulting the proper selection table.

POWER RATING

From the characteristics of the driven machine and its application determine the speed and torque requirements to establish the nominal power rating. Considering the intended usage, determine the service factor from the following table.

Operating Hours Per Day	Stops and Starts	Service Factor
8-10	Infrequent	1
8-10	Frequent	1:33
10-24	Infrequent	1:33
10-24	Frequent	1:67

Applying the service factor determine the required power rating; that is, multiply the power needed by the driven machine by the appropriate service factor to arrive at the power requirement of the Specon unit. For example, if the driven machine demands 10 HP and is operated 8 hours per day with frequent stops and starts the transmission required power rating would be 13.3 and a 2MDD transmission should be selected.

(Caution: Do not ignore the service factor requirement.)

SPEED AND RANGE

Determine the exact input speed. It should be within 10% of the rated input speeds indicated in the selection Tables for the transmission being considered for use.

If it is not, consult the factory for alternative options.

The user should determine the maximum no load to full load speed variation that can be tolerated. Consult the Output Speed Regulation Table (Page 2) to determine the acceptable draw range. This may be one of the typical ranges listed or intermediate between those shown.

Determine the nominal output speed required for the application. Using the draw range selected, calculate the minimum and maximum output speeds.

For Example, given a maximum No Load to Full Load requirement of 0.2%, the table on page 2 shows that the required regulation can be achieved with a speed range (draw) of 10%. If the rated input speed is 720 RPM and the nominal output speed requirement is 509 RPM with a +9% and -1% draw, the operating speed range is 504 to 554 RPM.

Having determined the required power rating, consult the appropriate output power capacity selection table and examine the minimum and maximum speeds for the speed range chosen.

Using the example cited, if the power determination has indicated a 1/2MDD, enter the Type A 1/2MDD-71 table at 10% speed range and compare minimum and maximum speeds in the table with the operating speed range (504 to 554 rpm). Note that either a 1/2-MDDX or 1/2-MDDZ will satisfy the requirement.

If the user application is such that the minimum and maximum speeds lie between adjacent rows in the table, the factory may be able to supply a transmission gear set which will satisfy the requirements. As an additional option, the user may enter the table at 15% speed range and determine if the minimum and maximum speeds are compatible with the transmission speeds shown. In this case, the user should be willing to accept the additional variation in speed from No Load to Full Load conditions.

In the case of Type B, check to assure that the output speed range falls within that shown in the Table. In the case of a Type C, check with factory to determine whether or not the desired combination of shaft positions and output speed can be accommodated.

Proceed to selection of Style and Assembly Configuration.

STYLE AND ASSEMBLY CONFIGURATION

Select a Style I, II or III transmission in accordance with the application speed and power requirements. Select an assembly arrangement according to the physical requirements of the driven machine with respect to input and output shaft locations and control handwheel location. Select horizontal or vertical arrangement.

Power capacities shown are maximum rated and should not be used in all cases as accuracy varies with power requirements, draw range and type of duty.

Style II transmission ratings may be reduced depending upon duty requirements.

REPAIR ONLY

	<u>SHAFT POSITIONS</u>	<u>INPUT VS. OUTPUT ROTATION</u>
Style I	Y	Same
	X	Opposite
	Z	Same
Style II	Y	Opposite
	X	Same
	Z	Opposite

In the event that the input speed is NOT within 10% of the rated input speeds indicated in the Selection tables the factory may be able to supply a transmission gear set which can satisfy the torque requirements at the rated speeds.

The user can make some simple calculations to determine if a standard transmission can be supplied, and to note its physical configuration, in order to assist him in preliminary planning. For example, suppose that the user's requirements are as follows:

Input speed	650 rpm
Output speed	725 to 790 rpm
Output Torque	400 # inches minimum
Service Factor	1.25 minimum
Input/output relative direction of rotation.	same

1 – Determine a nominal power rating from the requirements

$$T = \frac{HP \ 63000}{RPM}$$

$$HP = \frac{T \times RPM}{63000} \times SF = 6.27$$

where HP is the output power required, T is 400 # inches, RPM is maximum output speed and SF is service factor.

2– Using the Rating tables select a transmission which can furnish the required power.

A 1MDD unit will furnish 9 HP at a rated input speed of 900 rpm. Since the input speed will be 650 rpm, the power output will be reduced proportionally.

$$HP = \frac{650}{900} \times 9 = 6.50 \text{ which is adequate for the application}$$

Note that the Draw Range for this requirement is

$$100 \frac{(790-725)}{725} = 0.0897 \times 100 = 8.97\% \text{ approximately } 9\%$$

where Draw Range is the amount the maximum output speed exceeds the minimum output speed

$$\text{Draw Range (\%)} = \frac{100 (RPM \text{ max} - RPM \text{ min})}{RPM \text{ min}}$$

3 – Determine minimum and maximum output speeds of the selected transmission for this draw range.

$$\frac{900}{650} \times 725 = 1003.8 \text{ RPM minimum}$$

$$\frac{900}{650} \times 790 = 1093.8 \text{ RPM maximum}$$

where transmission rated input speed = 900 rpm and transmission operating speed = 650 rpm.

4 – Select closest standard speeds from rating table.

Since the user requires the same relative rotation between input and output shafts a Type A Style 1 transmission with output at Z is indicated. Enter the Type A Style 1 1MDDZ Table page 13 at 10% Draw Range (closest to 9% from step 2), and note that the closest standard minimum and maximum speeds are 999 and 1098 respectively. This means that the unit can supply the necessary torque at

$$\frac{650}{900} \times \text{Speed min (999)} = 721.5 \text{ RPM}$$

$$\frac{650}{900} \times \text{Speed max (1098)} = 793 \text{ RPM}$$

for an input speed of 650 rpm.

Note that the Draw Range is

$$100 \frac{(793-721.5)}{721.5} = 9.9\% \text{ which is slightly higher than the 8.97\% specified originally.}$$

The torque at the maximum speed will be

$$\frac{9 (63000)}{1098} = 516.4 \text{ # inches}$$

To summarize, the preliminary selection will supply

	Max Torque # inches	Min/Max Speed	Draw Range %
Actual	516.4	721.5 793	9.9
Specified	400	725 790	8.97

If absolutely necessary, the factory may be able to supply a non-standard gear set to more closely meet the specified requirements.

In the case of Type B, check to assure that the output speed range falls within that shown in the Table. In the case of a Type C, check with factory to determine whether or not the desired combination of shaft positions and output speed can be accommodated.

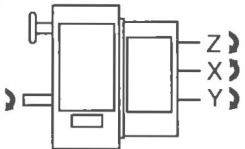
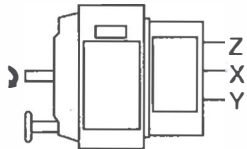
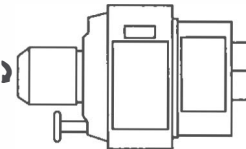
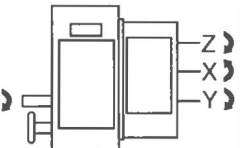
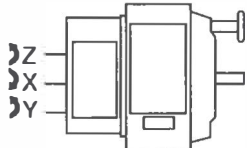
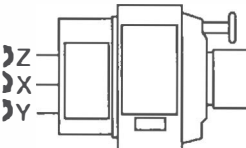
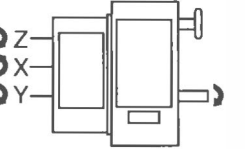
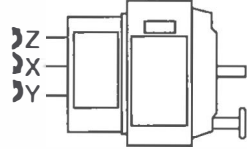
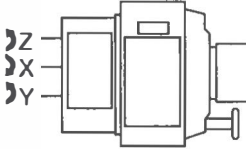
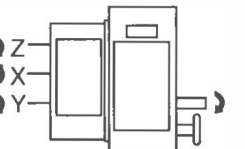
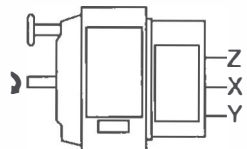
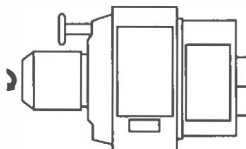
REPAIR ONLY

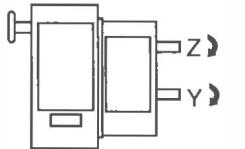
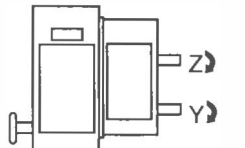
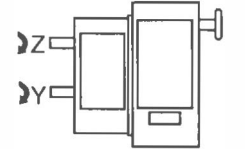
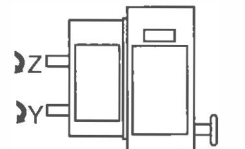
TRANSMISSION STYLES

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

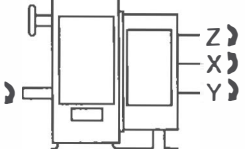
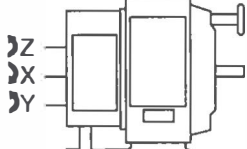
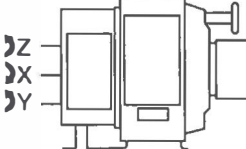
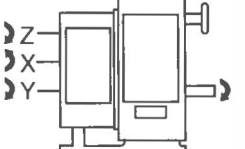
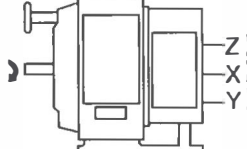
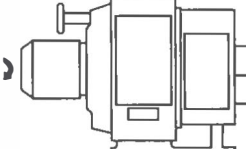
TYPE "B"
Input @ Y, Output @ Z

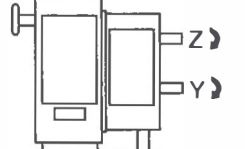
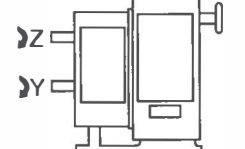
Horizontal Units (Top View)

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

STYLE I
 <p>ASSEMBLY A</p>
 <p>ASSEMBLY B</p>
 <p>ASSEMBLY C</p>
 <p>ASSEMBLY D</p>

Vertical Units (Side View)

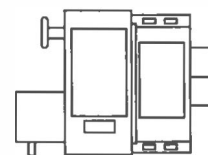
STYLE I	STYLE II	STYLE III
 <p>ASSEMBLY A</p>	 <p>ASSEMBLY 6</p>	 <p>ASSEMBLY 2</p>
 <p>ASSEMBLY C</p>	 <p>ASSEMBLY 8</p>	 <p>ASSEMBLY 4</p>

STYLE I
 <p>ASSEMBLY A</p>
 <p>ASSEMBLY C</p>

REPAIR ONLY

Right Angle
Input or Output

Consult
Factory
for Details.



SPECON 1/2 MDD-71 DIFFERENTIAL DRAW TRANSMISSION OUTPUT POWER CAPACITY 4 1/2 HP MAX.

TYPE A, STYLE I

RATED INPUT SPEED — 720 RPM

CONTROL SCREW TURNS: — 71, 9.5
— 84, 8.8

DRAW OR SPEED RANGE AND OUTPUT RPM														Rotation Output vs. Input	Output Shaft Pos.
Model No.	4%		5½%		7½%		10%		15%		20%				
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.			
½ MDDY-71	1364	1420	1339	1414	1308	1407	1271	1397	1198	1379	1132	1363	Same	Y	
½ MDDX-71	2387	2485	2344	2474	2288	2462	2225	2444	2097	2413	1982	2385	Opp.	X	
	1970	2050	1934	2041	1888	2031	1836	2017	1730	1991	1635	1968			
	1564	1628	1535	1621	1499	1613	1457	1602	1373	1581	1298	1563			
	1364	1420	1339	1414	1308	1407	1271	1397	1198	1379	1132	1363			
	1190	1239	1168	1234	1141	1228	1109	1219	1045	1203	988	1189			
	945	983	927	979	906	974	880	967	830	955	784	944			
	780	811	765	808	747	804	726	798	685	788	647	779			
	706	735	693	732	677	728	658	722	620	713	586	705			
	637	663	625	660	610	657	593	652	559	643	528	636			
	541	563	531	561	519	558	504	554	475	547	449	541			
	455	473	447	471	436	468	424	465	400	459	378	454			
	½ MDDZ-71	2737	2849	2687	2837	2623	2823	2551	2802	2403	2766	2272			2734
2301		2395	2259	2384	2205	2373	2144	2356	2020	2326	1910	2298			
2259		2351	2218	2341	2165	2323	2105	2313	1983	2283	1785	2256			
2083		2167	2045	2158	1996	2148	1941	2132	1829	2105	1729	2080			
2058		2142	2020	2133	1973	2122	1918	2107	1807	2080	1708	2056			
1795		1868	1762	1860	1721	1851	1673	1838	1576	1814	1490	1793			
1793		1866	1760	1858	1719	1849	1671	1835	1574	1813	1488	1791			
1719		1789	1688	1781	1648	1772	1602	1760	1510	1738	1427	1717			
1564		1628	1535	1621	1505	1613	1457	1602	1373	1581	1298	1563			
1364		1420	1339	1414	1308	1407	1271	1397	1198	1379	1132	1363			
1190		1239	1168	1234	1141	1228	1109	1219	1045	1203	988	1189			
1083		1127	1063	1122	1038	1117	1009	1109	951	1094	898	1081			
1038		1081	1019	1076	995	1071	967	1063	912	1049	861	1037			
1036		1079	1017	1074	994	1069	966	1062	910	1048	860	1036			
905		942	887	938	867	933	843	926	794	914	751	904			
893		930	877	926	857	921	832	915	785	903	741	893			
823		857	809	854	790	850	768	844	723	833	684	823			
809		842	794	838	775	834	753	828	710	817	671	808			
729		760	716	757	700	753	680	747	641	738	606	729			
718		747	704	744	688	740	669	735	630	725	595	717			
680		708	667	705	652	701	633	697	597	688	564	679			
621		646	609	643	595	640	578	636	545	627	515	620			
616		641	604	638	590	635	574	630	541	622	511	615			
592		617	581	614	568	611	552	607	520	599	492	592			
555		578	545	576	533	573	518	569	488	561	461	555			
541		563	531	561	519	558	504	554	475	547	449	541			
536		558	526	556	514	553	500	549	471	542	445	536			
521		542	512	540	500	537	486	534	458	527	433	520			
484		504	475	501	464	499	451	495	425	489	401	483			
472		492	463	489	453	487	440	484	415	477	392	472			
455		473	447	471	436	468	424	465	400	459	378	454			
411		428	404	426	395	424	383	421	361	416	341	411			
397		413	390	411	381	409	370	406	349	401	329	396			
375		390	368	388	360	387	349	384	329	379	311	374			
346		359	340	358	332	356	322	354	304	349	287	345			
315		327	309	326	302	324	294	322	277	318	262	314			
309	322	304	321	297	319	288	317	272	313	257	309				
280	291	275	290	269	289	261	287	246	283	232	280				
260	270	255	269	249	267	243	266	229	262	216	259				
253	263	248	262	243	261	235	259	222	255	210	252				
236	245	231	243	226	242	220	240	207	237	196	234				
215	224	211	223	206	222	200	220	189	217	178	215				
213	221	209	220	204	218	198	217	187	214	177	212				
181	187	178	187	173	186	169	184	159	182	150	180				
152	157	149	157	146	156	142	155	134	153	126	151				

REPAIR ONLY

* Also available in Type B configuration. NOTE: Ranges shown in shaded area have limited Torque capacity — See Page 4

SPECON 2 MDD-66 DIFFERENTIAL DRAW TRANSMISSION OUTPUT POWER CAPACITY 15 HP MAX.

TYPE A, STYLE I

RATED INPUT SPEED — 900 RPM

CONTROL SCREW TURNS: — 66, 9.8
— 84, 9.1

DRAW OR SPEED RANGE AND OUTPUT RPM																		
Model No.	3%		4%		5%		7½%		10%		15%		20%		Rotation Output vs. Input	Output Shaft Pos.		
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.				
2MDDY-66	1720	1772	1708	1776	1688	1772	1636	1759	1588	1747	1497	1722	1422	1706	Same	Y		
2MDDX-66	1720	1772	1708	1776	1688	1772	1636	1759	1588	1747	1497	1722	1422	1706	Opp.	X		
	1577	1624	1566	1627	1548	1624	1500	1612	1456	1601	1372	1578	1304	1563				
	1403	1445	1394	1448	1377	1445	1335	1434	1296	1425	1221	1404	1160	1391				
	1175	1210	1167	1213	1153	1210	1118	1201	1085	1193	1023	1176	972	1165				
	978	1006	971	1009	959	1006	930	999	903	992	851	978	808	969				
	860	886	854	888	844	886	818	879	794	873	749	861	711	853				
	703	723	698	725	689	723	668	718	649	713	611	703	581	696				
	607	625	603	627	596	625	578	621	561	616	529	607	502	602				
	2438	2511	2421	2516	2392	2511	2319	2492	2250	2475	2122	2440	2015	2417			Same	Z
	2395	2466	2378	2472	2350	2466	2278	2448	2211	2431	2084	2397	1980	2374				
1984	2048	1975	2053	1952	2048	1892	2033	1836	2019	1731	1990	1644	1972					
1954	2013	1941	2017	1918	2013	1859	1998	1804	1984	1701	1956	1616	1938					
1720	1772	1708	1776	1688	1772	1636	1759	1588	1747	1497	1722	1422	1706					
1577	1624	1566	1627	1548	1624	1500	1612	1456	1601	1372	1578	1304	1563					
1530	1576	1520	1580	1502	1576	1456	1565	1413	1554	1332	1532	1265	1517					
1446	1489	1436	1492	1419	1489	1375	1478	1335	1468	1258	1446	1195	1433					
1403	1445	1394	1448	1377	1445	1335	1434	1296	1425	1221	1404	1160	1391					
1286	1324	1277	1327	1262	1324	1223	1314	1187	1305	1119	1287	1063	1275					
1175	1210	1167	1213	1153	1210	1118	1201	1085	1193	1023	1176	972	1165					
1145	1179	1137	1181	1123	1179	1089	1170	1057	1162	996	1145	946	1135					
1077	1109	1070	1112	1057	1109	1025	1101	995	1094	938	1078	891	1068	Same	Z			
978	1006	971	1009	959	1006	930	999	903	992	851	978	808	969					
959	987	952	989	941	987	912	980	885	973	834	959	792	950					
896	922	890	925	879	922	852	916	827	909	780	896	741	888					
860	886	854	888	844	886	818	879	794	873	749	861	711	853					
803	826	797	828	788	826	764	820	741	815	699	803	664	796					
797	821	792	823	783	821	758	815	736	809	694	798	659	790					
789	812	783	814	774	812	750	806	728	800	686	789	652	781					
703	723	698	725	689	723	668	718	649	713	611	703	581	696					
668	687	663	689	655	687	635	682	616	677	581	668	552	662					
644	663	639	664	632	663	612	658	594	653	560	644	532	638					
607	625	603	627	596	625	578	621	561	616	529	607	502	602					
588	605	584	606	577	605	559	600	543	596	512	588	486	582	Same	Z			
573	589	569	591	562	589	545	585	529	581	499	573	474	568					
556	572	552	573	545	572	528	567	513	564	484	555	459	550					
496	510	491	511	486	510	471	506	458	503	431	495	410	491					
489	503	486	504	480	503	465	499	451	496	426	489	404	484					
480	494	476	495	471	494	456	490	443	487	418	480	397	475					
430	443	427	444	422	443	409	439	397	436	375	430	356	426					
415	427	412	428	407	427	395	424	383	421	361	415	343	411					
399	411	396	411	392	411	380	408	369	405	347	399	330	395					
351	361	349	362	345	361	334	359	324	356	306	351	291	348					
345	355	343	356	339	355	328	352	319	350	301	345	286	342					
304	312	302	313	298	312	289	310	281	308	265	304	251	301					
287	295	285	295	282	295	273	293	265	291	250	286	237	284	Same	Z			
248	255	246	256	244	255	236	253	229	251	216	248	205	245					
215	220	213	221	211	220	204	219	198	217	187	214	178	212					

*Also available in Type B configuration.

NOTE: Ranges shown in shaded area have limited Torque capacity — See Page 4

REPAIR ONLY

SPECON 3 MDD- 66 DIFFERENTIAL DRAW TRANSMISSION OUTPUT POWER CAPACITY 22 1/2 HP MAX.

TYPE A, STYLE I

RATED INPUT SPEED — 900 RPM

CONTROL SCREW TURNS: — 66, 12.4
— 84, 11.7

DRAW OR SPEED RANGE AND OUTPUT RPM																
Model No.	3%		4%		5%		7½%		10%		15%		20%		Rotation Output vs. Input	Output Shaft Pos.
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
3MDDY-66	1720	1772	1708	1776	1688	1772	1636	1759	1588	1747	1497	1722	1422	1706	Same	Y
3MDDX-66	1720	1772	1708	1776	1688	1772	1636	1759	1588	1747	1497	1722	1422	1706	Opp.	X
	1486	1530	1475	1533	1458	1530	1413	1519	1372	1508	1293	1487	1228	1473		
	1346	1386	1337	1389	1321	1386	1280	1376	1243	1367	1172	1347	1113	1334		
	1159	1193	1150	1196	1137	1193	1102	1184	1070	1176	1008	1159	958	1148		
	892	919	886	921	876	919	849	912	824	906	777	893	738	884		
	754	776	749	778	740	776	718	771	696	765	657	755	624	748		
	671	690	666	692	658	690	638	685	619	697	584	671	555	665		
484	498	481	499	475	498	461	494	447	491	421	484	400	479			
3MDDZ-66	2288	2356	2272	2362	2245	2356	2176	2339	2112	2323	1991	2290	1892	2269	Same	Z
	2035	2096	2021	2101	1997	2096	1936	2080	1879	2066	1771	2037	1683	2018		
	1720	1772	1708	1776	1688	1772	1636	1759	1588	1747	1497	1722	1422	1706		
	1558	1605	1547	1608	1529	1605	1482	1593	1439	1582	1356	1559	1288	1545		
	1486	1530	1475	1533	1458	1530	1413	1519	1372	1508	1293	1487	1228	1473		
	1346	1386	1337	1389	1321	1386	1280	1376	1243	1367	1172	1347	1113	1334		
	1283	1321	1274	1324	1259	1321	1220	1311	1184	1302	1117	1284	1061	1272		
	1162	1197	1154	1200	1141	1197	1106	1188	1073	1180	1012	1163	961	1152		
	1159	1193	1150	1196	1137	1193	1102	1184	1070	1176	1008	1159	958	1148		
	1054	1085	1046	1087	1034	1085	1002	1077	973	1069	917	1054	871	1044		
	1000	1030	993	1032	982	1030	952	1022	924	1015	871	1001	827	991		
	892	919	886	921	876	919	849	912	824	906	777	893	738	884		
	780	803	775	805	766	803	742	797	720	792	679	781	645	733		
	771	793	765	795	756	793	733	787	711	782	671	771	637	764		
	754	776	749	778	740	776	718	771	696	765	657	755	624	748		
	698	719	693	720	685	719	664	713	645	709	608	698	577	692		
	671	690	666	692	658	690	638	685	619	697	584	671	555	665		
	652	671	647	672	639	671	620	666	602	661	567	652	539	646		
	601	619	597	620	590	619	572	614	555	610	523	601	497	595		
	590	607	586	609	579	607	562	603	545	599	514	590	488	585		
	579	596	575	598	569	596	551	592	535	588	504	579	479	574		
	525	540	521	541	515	540	499	536	485	533	457	525	434	520		
	508	523	505	524	499	523	483	519	469	515	442	508	420	503		
	484	498	481	499	475	498	461	494	447	491	421	484	400	479		
	463	476	460	477	454	476	440	473	428	470	403	463	383	459		
	452	465	449	466	444	465	430	461	417	458	393	452	374	447		
	418	430	415	431	410	430	398	427	386	424	364	418	346	414		
391	403	389	403	384	403	372	400	361	397	341	391	324	388			
379	390	376	391	372	390	360	387	350	385	330	379	313	376			
348	358	346	359	342	358	331	355	321	353	303	348	288	345			
331	340	329	341	325	340	315	338	306	335	288	331	274	328			
326	335	324	336	320	335	310	333	301	331	284	326	270	323			
294	302	292	303	289	302	280	300	272	298	256	294	243	291			
262	269	260	270	257	269	249	267	242	265	228	261	216	259			
251	258	250	259	247	258	239	256	232	254	219	251	208	249			
212	218	211	219	209	218	202	217	196	215	185	212	176	210			
189	194	188	194	185	194	180	192	174	191	164	188	156	187			
136	140	135	140	134	140	130	139	126	138	119	136	113	135			

For Type B speeds consult factory.

NOTE: Ranges shown in shaded area have limited Torque capacity — See Page 4

REPAIR ONLY

SPECON 3 MDD-66 DIFFERENTIAL DRAW TRANSMISSION OUTPUT POWER CAPACITY 22½ HP MAX.

TYPE B, STYLE I

RATED INPUT SPEED — 900 RPM

CONTROL SCREW TURNS: 66 12.4,
84 11.7

ROTATION: OUTPUT VS INPUT SAME
INPUT SHAFT AT POSITON Y, OUTPUT SHAFT AT POSITION Z

Model No.	DRAW OR SPEED RANGE AND OUTPUT RPM													
	3%		4%		5%		7½%		10%		15%		20%	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
3MDD	1554	1601	1543	1604	1522	1599	1478	1588	1431	1576	1352	1555	1283	1539
	1335	1376	1328	1381	1309	1376	1274	1366	1232	1356	1163	1337	1104	1324
	1210	1247	1204	1251	1187	1247	1151	1238	1116	1229	1054	1212	1000	1200
	1046	1077	1039	1080	1025	1077	995	1069	964	1061	910	1047	864	1037
	903	930	898	933	885	930	859	923	832	917	786	904	746	895
	818	843	813	845	802	843	779	837	754	831	712	819	676	811
	704	725	700	728	690	725	670	720	649	715	613	705	582	698
	542	559	539	560	531	558	516	554	500	550	472	543	448	538
	458	472	456	474	449	472	436	469	423	466	399	459	379	455
	408	420	405	421	399	420	388	417	376	414	355	408	337	404
	294	303	292	304	288	303	280	301	271	298	256	294	243	292

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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

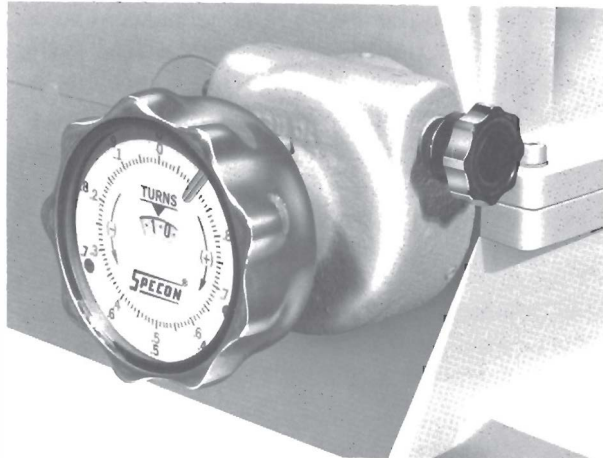


FIGURE 13

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.

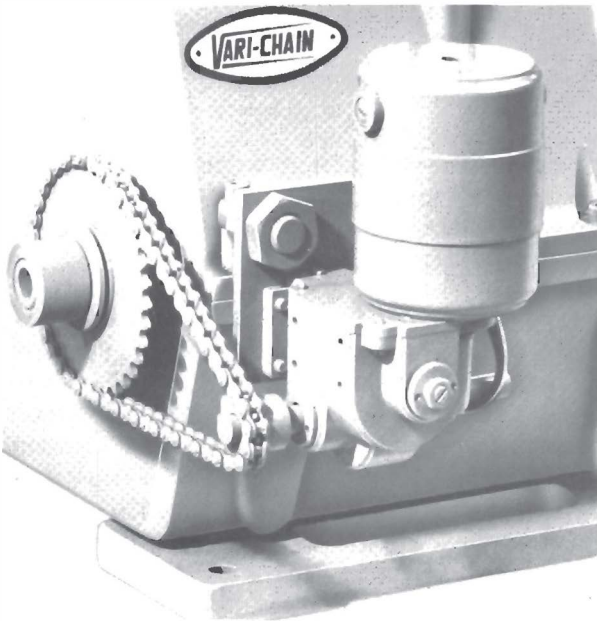


FIGURE 14

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

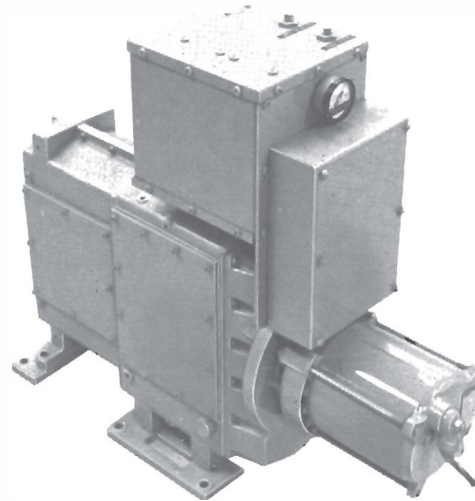
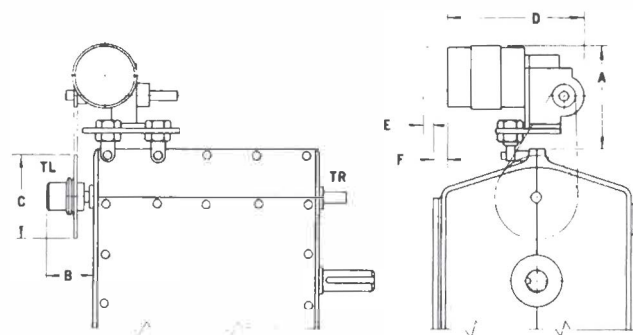


FIGURE 16

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.



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 ¹ / ₁₆	
1	5 ³ / ₈	2 ¹ / ₂	3 ¹⁵ / ₁₆	7 ³ / ₈	7 ¹ / ₁₆	
2	5 ³ / ₈	2 ¹ / ₂	4 ³³ / ₆₄	7 ³ / ₈		3 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 ⁵ / ₈	

FIGURE 15

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TACH GENERATOR



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 1/2" 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

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 5MDDZ-66 Type A Style I, Assembly A,
Horizontal Input speed 720 RPM

Output speed — 665-732 RPM. 10% draw.

Equipped with — (List control required).

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