Hi-Lo Manufacturing

Variable Speed Pulley Drives

...with automatic belt tensioning

Power-Transmission Equipment

for economy, efficiency and reliability

30149 Stacy Ponds Drive, Suite 100
Stacy, MN 55079

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www.hi-lo.com

Hi-Lo Manufacturing

Variable Speed Pulley Drives

Thank you for your interest in **Hi-Lo Manufacturing**. For over 56 years, **Hi-Lo Manufacturing** has produced reliable, efficient and economical Variable Speed Pulley Drives. Our innovative ***automatic belt tensioning design*** coordinates belt tension with load requirement and makes our Variable Speed Pulleys an industry favorite.

Hi-Lo Manufacturing carries a full line of Variable Speed Pulley Drive products:

- Adjustable and Fixed Center Distance Pulley Drives, and VARI-Mod Drive Systems
- Asymmetric Pulley Drives
- Variable Speed Belts, Sheaves, Bushings, Collets and Motor Bases
- Hi-Ratio Compound Drives
- Custom Machining

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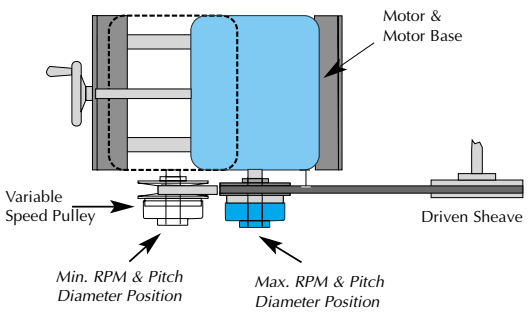
Catalog Index

Click on where you want to go

Adjustable Center Distance Drives

Pages 7–20



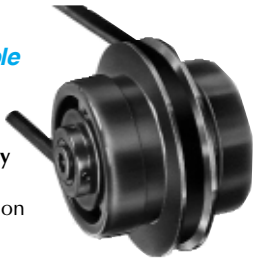
TBR Series
Single Face Moveable

Pages 10–11

The **TBR** series of pulleys have single face movement to provide greater economy on longer center distance V-V drives where absolute belt alignment is not critical. Their through bore construction allows mounting from either end.

DCV & DCW Series
Double Face Moveable

Pages 12–15



Both the **DCV** & **DCW** series have **double pulley face movement** to maintain belt alignment on V-V drives.

Asymmetric Drives

Pages 22, 16–17 & 32–33

With **Asymmetric Drives**, the fixed pulley face is nearly perpendicular. This feature means **negligible movement of th** **diameter range.** The overhung load is minimal and the drive space is very compact. The reduction of parts in the single sliding face design cuts down on wear.

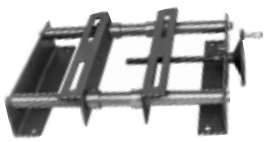
DISCONTINUED

Rated HP	Pitch Ratio	Series Model	Page
Single Face Moveable			
.75	2:1	**30TBR**	**10**
1	2.5:1	**40TBR**	**10**
1	3.4:1	**40TBR-W**	**10**
1.5	2.7:1	**50TBR**	**10**
2	2.5: 1	**57-20TBR**	**10**
3	2.5:1	**57TBR**	**10**
5	2:1	**66TBR**	**10**
5	1.6:1	**86TBR**	**10**
Double Face Moveable			
1	2.3:1	**DCV140**	**12**
1.5	2.5:1	**DCV150**	**12**
1.5	3:1	**DCW1160**	**14**
2	2.2:1	**DCV157-20**	**12**
3	2.2:1	**DCV157**	**12**
3	3:1	**DCW1270**	**14**
5	2.5:1	**DCV167**	**12**
5	3:1	**DCW1590**	**14**
10	3:1	**DCW1711**	**14**
20	2.5:1	**DCW2011**	**14**
30	3:1	**DCW2513**	**14**
Two Groove/Belt Pulleys			
5	2:1	**DCV257**	**12**
7.5	1.75:1	**DCV265**	**12**
Asymmetric			
			16
			16
20	2.5:1	**A112-33**	**16**
30	2.3:1	**A130-33**	**16**

MOTOR BASES

Page 20

Hi-Lo Motor Bases for *Adjustable Center Distance Drives* have been designed to accommodate NEMA motor frame sizes 48 through 286T.



Belts

Page 18

Hi-Lo Belts are selected for optimum performance on variable speed pulley drives. They stable and heat resistant, and static dissipating.

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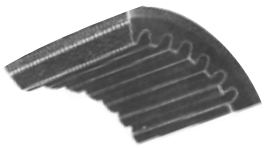


Sheaves & Bushings

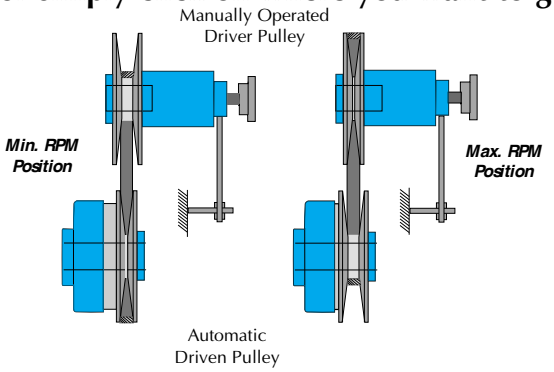
Page 18

Variable Speed Belt and Asymmetric Belt sheaves are made of close-grained cast iron, accurately machined and [illegible] bushings to provide a wide range of standard bore sizes and tight bore-shaft fits with ease of installation.

Fixed Center Distance Drives

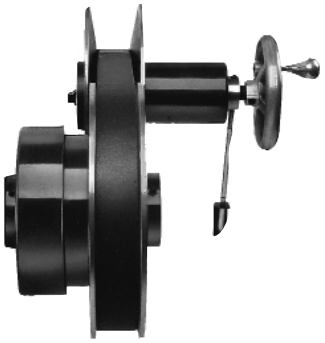
Pages 25 - 35 or simply click on where you want to go

Rated HP 1750 to Max.	Driven RPM at Min.	Drive Ratio	RPM Range 1750 Motor	Driver Model #	Driven Model #	Page
V-Belt Drives						
				MCV30		**28**
.75	.38	4:1	875/3500		**30TBR**	**28**
1.0	.39	3.1:1	687/2106		**40TBR**	**28**
				MCV500		**28**
1.5	.55	7.1:1	647/4625		**50TBR**	**28**
2.0	.64	5: 1	557/3014		**57-20TBR**	**28**
2.0	.64	5.4:1	557/3014		**57TBR**	**28**
2.0	.55	4.6:1	485/2248		**66TBR**	**28**
2.0	.52	3.8:1	367/1408		**86TBR**	**28**
				MCV57		**28**
3.0	1.10	6.9:1	1648/4500		**57TBR**	**28**
3.0	.97	5.7:1	564/3214		**66TBR**	**28**
5.0	1.22	4.0:1	427/1750		**86TBR**	**28**
				MCW600		**32**
1.0	.31	10:1	550/5500		**60TBR**	**32**
1.5	.34	7.5:1	400/3000		**75TBR**	**32**
				MCW70		**30**
2.0	.50	9.6:1	423/4075		**80TBR**	**30**
3.0	.65	7.7:1	375/2863		**90-19TBR**	**30**
3.0	.60	5.8:1	305/1776		**110TBR**	**30**
				MCW77		**30**
3.0	.77	7.7:1	450/3470		**90-19TBR**	**30**
5.0	1.00	5.8:1	365/2108		**110TBR**	**30**
				MCW90		**30**
3.0	.77	10:1	450/4500		**90-23TBR**	**30**
5.0	1.00	9:1	380/3420		**106TBR**	**30**
5.0	.96	7.4:1	336/2490		**120TBR**	**30**
				MCW90-75		**30**
7.5	1.70	6:1	395/2367		**120TBR**	**30**
Asymmetric Belt Drives						
				MA82		**32**
5.0	1.50	6:1	500/3000		**A96**	**32**
				MA96		**32**
10.0	3.20	5.4:1	560/3000		**A112**	**32**
				MA112		**32**
15.0	4.30	6:1	500/3000		**A130**	**32**
				MA112-33		**32**
30.0	9.80	5:1	600/3000		**A130-33**	**32**
				MA136		**34**
40.0	11.40	5:1	600/3000		**A164**	**34**
				MA164		**34**
50.0	35.00	4.5:1	784/3580		**A164**	**34**
60.0	30.00	4.6:1	700/3220		**A177**	**34**
				MA177		**34**
75.0	55.00	3:1	1010/3000		**A177**	**34**
100	40.00	4:1	595/2380		**A221**	**34**
				MA221		**34**
125	75.80	2.5:1	838/2055		**A221**	**34**



MCV & MCW Series (V-Belt Drive)

Pages 28 & 30



The **MCV** and **MCW** series pulleys are **Fixed Center Distance Drive** type pulleys. The **MCV** uses Standard V-Belts and have horsepower ratings from **fractional to 5 HP**. the **MCW** pulleys use Variable Speed Belts and have horsepower ratings from **1 to 7-1/2 HP**. The automatic pulleys have Automatic Belt Tensioning.

MA Series (Asymmetric Belt Drive)

Pages 34–37

The **MA series pulleys** have a **5 to 125 HP** capacity range and use a unique patented Asymmetric Belt that **maintains belt alignment with single face movement** of the pulleys. The driven pulleys incorporate automatic belt tensioning.

Hi-Ratio Compound Pulleys

Pages 39–40

The Hi-Ratio series of pulleys are compound ratio type pulleys using Standard V-Belts. The horsepower range is fractional to **1 HP with speed variation ratios up to 7:1**.

VARI-Mod DRIVES

Page 36

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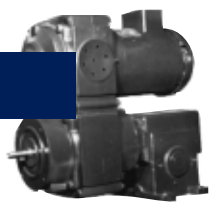
components to build variable speed drives of all types and arrangements.



What is a Variable Speed Pulley Drive?

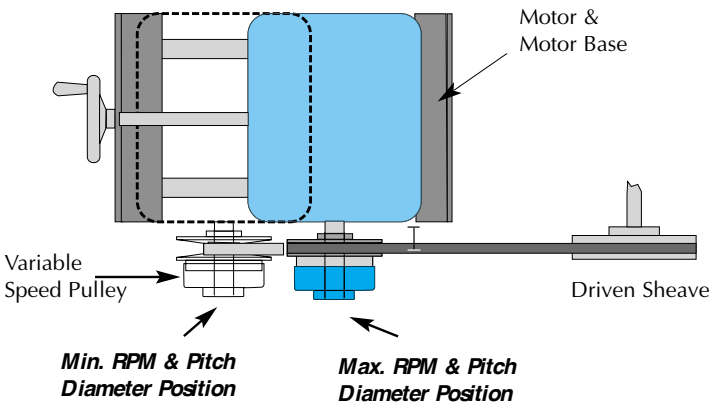
A variable speed pulley is a V-grooved sheave in which the groove width can be mechanically increased or decreased to allow a V-belt to ride in the groove at various diameters. Its function is to vary the speed of and transmit power to a driven shaft through a V-Belt and a companion sheave.

The speed is varied by changing the diameter at which the belt rides in the variable speed pulley and, therefore, the ratio between it and the companion sheave.

There are two basic types of Hi-Lo Variable Speed Pulley Drives:
Adjustable Center Distance Drives and
Fixed Center Distance Drives

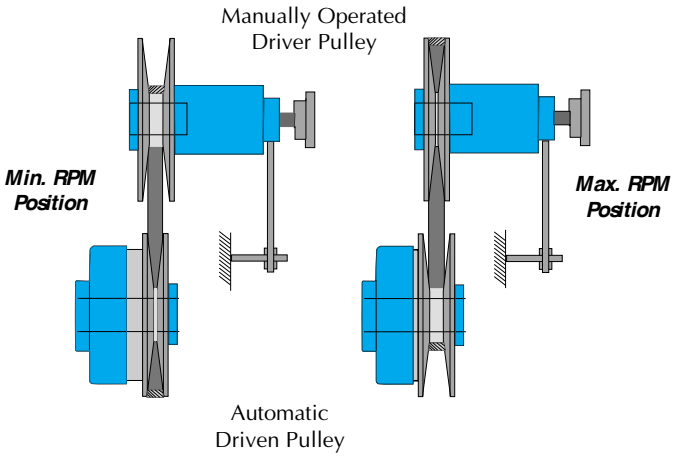
Adjustable Center Distance Drives

One shaft is fixed and the other is moveable. The variable speed pulley is normally mounted on the moveable shaft and a fixed diameter sheave on the stationary shaft. By using an adjustable motor base, speed variation of the driven shaft is accomplished by mechanically changing the center distance between the shafts. An increase in center distance will pull the belt to a smaller diameter in the variable speed pulley. This increases the drive ratio and reduces the driven shaft RPM. A decrease in center distance allows the spring loaded pulley faces to close and push the belt to a larger diameter.



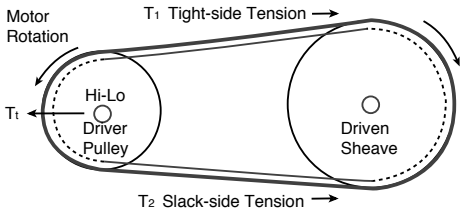
Fixed Center Distance Drives

The driver and the driven shafts are both stationary. The drive consists of two adjustable pitch diameter pulleys. One pulley is manually controlled by means of an adjusting screw. The driven pulley adjusts automatically to belt movement. Speed variation is accomplished by turning the adjusting screw in the mechanical pulley, causing the pulley faces to move in or out and, therefore, changing the pitch diameter at which the belt rides. This causes a compensating opposite change of the pitch diameter in the automatic pulley, usually mounted as the driven pulley. The RPM of the driven shaft changes with the change of ratio in the pitch diameters of the two pulleys.



V-Belt Tensioning

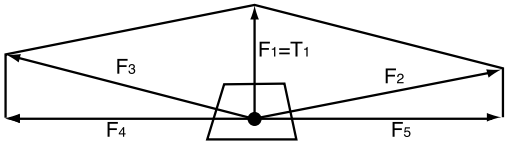
To the right is an illustration of the tension loads which are applied to a variable speed pulley. These loads must be counteracted by axial pressure in the pulley to maintain the necessary tension to transmit a required driven load.



Tension Force Direction

Resolution of Tension Forces on V-Belt

In the figure to the right, $F_1 = T_t$. F_2 and F_3 are the forces applied perpendicular to the Pulley faces by F_1, which axially spread the faces. F_4 and F_5 are the axial forces which must be counteracted to maintain belt tension.



Resolution of Tension Forces on V-Belt

Formulas

Where:

HP = Design Horsepower

V = Belt Velocity in feet per minute
= .262 x Pulley Dia. (in.) x Pulley RPM

T_e = Effective Belt Tension
$= \frac{33{,}000 \times HP}{V}$

R = Tension Ratio $= \frac{T_1}{T_2}$ = (Normally from 3 to 5)

$T_1 = T_e \times \left(\frac{R}{R-1}\right)$

$T_2 = T_1 - T_e$

$T_t = T_1 + T_2$ = Total Belt Tension

(omitting the effect of centrifugal force)

Automatic Belt Tensioning

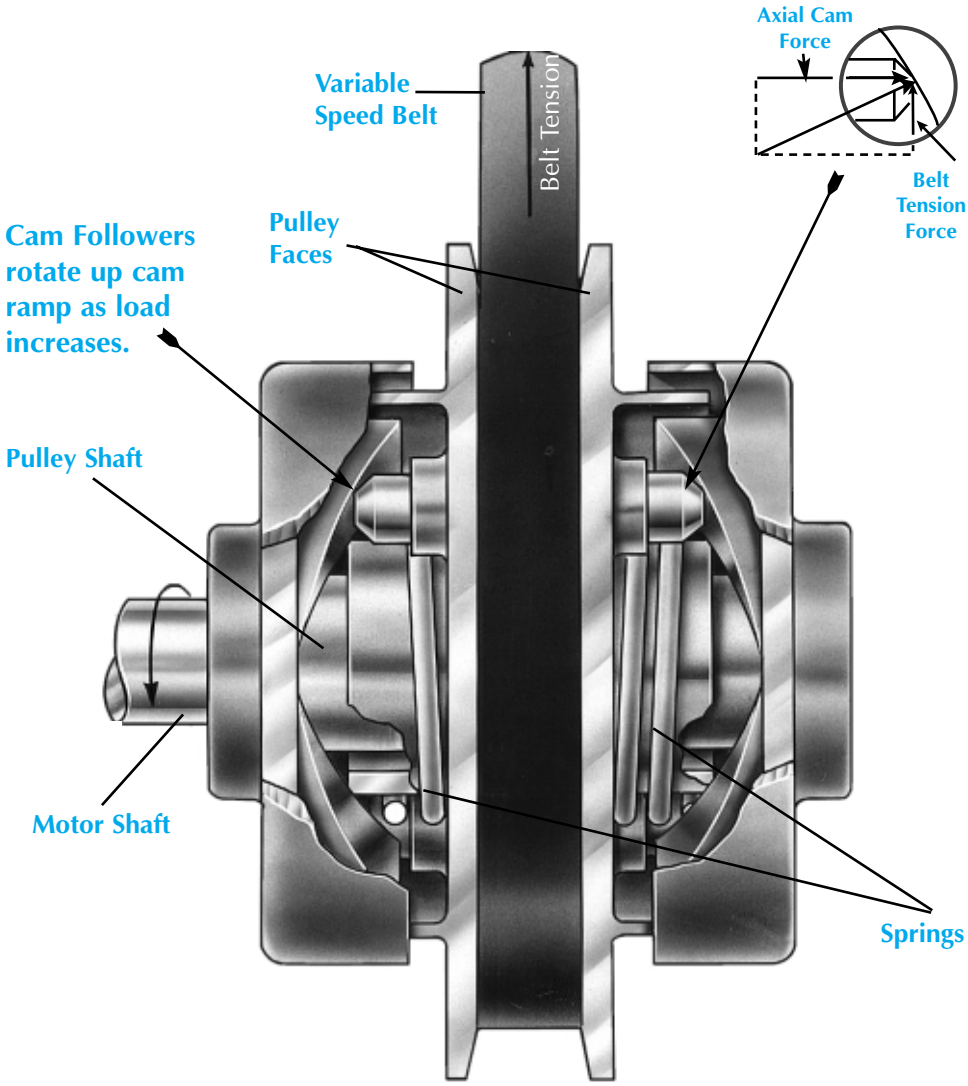
The power rating of a variable speed pulley depends on the force it can transmit through a V-belt and companion sheave to a driven shaft. The most common means of providing belt tension is by an axial force applied by a compression spring against the movable flange of the variable speed pulley. The larger the load requirement of a drive, the greater the required belt tension and the greater the required axial force (normally 3 times the effective belt tension).

Variable speed pulleys are often subjected to short duration loads, such as high starting loads and cyclical loads which are considerably larger than normal running loads. To transmit these loads, without slippage or loss of performance, belt tension well in excess of required running load tension must be developed.

However, the more a belt is subjected to the extra tension required for peak loads, the greater the chance to fatigue the belt and other drive components. The efficiency of the drive is also affected adversely.

Automatic Belt Tensioning solves drive fatigue problem.

Hi-Lo pulleys reduce unwanted belt tension by automatically adjusting belt tension with an exclusive cam mechanism. The load requirement itself determines how much axial force and resulting belt tension is needed. Consequently a **Hi-Lo Pulley automatically grips the belt tighter at start up and peak loads, then relaxes its grip at normal running loads. Your drives live longer.**

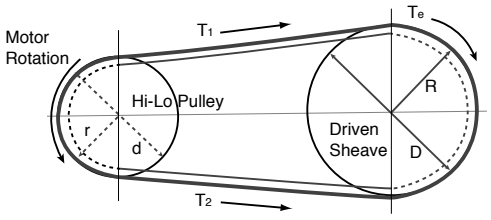


When a Hi-Lo Pulley is mounted on a motor shaft, the pulley shaft, with the cam housing attached, becomes integral with the motor shaft. The sliding pulley faces, however, are free to move axially and rotate until the cam followers, due to the effective belt tension, contact the cams. When the belt tension requirement increases, the cam followers rotate up the helical cam ramp causing additional axial pressure between the faces and the belt. The belt is consequently gripped tighter and the increased load can be transmitted without slippage or loss of pitch diameter setting. When the belt tension requirement decreases, there is an opposite reaction and the axial force is reduced.

The cam mechanism also provides peripheral support to the pulley faces and reduces pressure and wear on the sliding face bearing surfaces. The necessity of torque carrying keys in the pulley shaft and slide face are also eliminated and full bearing surface area contact is achieved.

Charts and Power Formulas For Designing Drives

A review of the derivation of rotating horsepower and the relationship of torque will be helpful in designing and understanding the power transmission capabilities and limitations of variable speed pulley drives.



Where:

T_e = Effective Belt Tension or Force or Belt Pull
d = Variable Speed Pulley Pitch Diameter (in.)
r = Variable speed Pulley Pitch Radius (in.)
D = Driven Sheave Pitch Diameter (in.)
R = Driven Sheave Pitch Radius (in.)
T = Torque = Te x r or Te x R
HP = Horsepower
RPM = Revolutions Per Minute

By definition, WORK is force operating over a distance and POWER is the rate at which work is done.

$$\text{Power} = \frac{\text{Force x Distance}}{\text{Time}}$$

One HP equals 33,000 ft-lbs of work per minute; the power required to lift 33,000 pounds one foot in one minute.

The FORCE (T_e) which originates from the prime mover or motor is applied through the belt at the sheave pitch diameter.

The Distance that the Force travels in one minute equals the circumference of the sheave at the belt diameter times the sheave RPM.

$$\text{Distance (in feet)} = \frac{2\pi R \times RPM}{12}$$

$$\text{Formula 1: } HP = \frac{\left(\frac{T_e \times 2\pi R \times RPM}{12}\right)}{33{,}000} = \frac{T_e \times R \times RPM}{63{,}025} = \frac{T \times RPM}{63{,}025}$$

$$\text{Formula 2: } T = \frac{HP \times 63{,}025}{RPM}$$

Table 1 Conditional service factors for drive selection

Service Environment	Operating Hours Per Day 0–8	8–16	16–24
NORMAL DUTY: Where infrequent starting and peak loads do not exceed 160% of normal running load	1.00	1.10	1.30
MODERATE DUTY: Where occasional starting and peak loads do not exceed 250% of normal running loads	1.20	1.30	1.35
HEAVY DUTY: Where occasional starting and peak loads are in excess of 250% of normal running loads OR where starting loads, peak loads and overloads occur frequently	1.25	1.35	1.50

The service factors are important in selecting a variable speed pulley that will provide adequate service life.
Multiply the maximum running torque or horsepower of the drive by the appropriate service factor to determine the proper capacity Hi-Lo Pulley.

Table 2 Starting torque characteristics of various machines

Torque	% of Running Torque	Types of Machines	Motor requirements
Breakaway torque	120% to 130%	General machines with ball or roller bearings.	Standard motor
Breakaway torque	130% to 160%	General machines with sleeve bearings.	Standard motor
Breakaway torque	160% to 250%	Conveyors and machines with excessive sliding friction.	Standard motor or possible high-torque or oversize motor
Breakaway torque	250% to 600%	Machines that have “high” load spots in their cycle, like some printing and punch presses, and machines with cam or crank-operated mechanisms.	Standard, high-torque or possible oversize motors
High-inertia starting torque	Nominal rating of motor will depend on the starting requirements.	Machines with flywheels or other heavy rotating masses. Also, some machines that move large masses by cranks, centrifuges, etc.	Motor rating will depend on the time required to bring load up to speed. High torque, high slip.

Table 3 Load types and their relation to drive selection

HP and Torque Characteristics	Application Examples	Adjustable Speed Selection
Constant HP. Torque varies inversely at speed.	Metal-cutting tools operating over wide speed range.	Power for 2/3 of HP at minimum speed.
	Some extruders, mixers, special machines where operation at low speed may be continuous.	Power for full HP at minimum speed.
Constant torque. HP varies as the speed.	General machinery, hoists, conveyors, printing presses, etc., represents 90% of applications.	Power for HP at maximum speed. If replacing a constant-speed drive, be sure to calculate hp at new maximum speed.
Squared exponential. HP varies as square of speed. Torque varies as the speed.	Positive displacement pumps, or some mixers, some extruders.	Power for maximum HP at maximum speed. Set upper limit speed stop.
Cubed exponential. HP varies as cube of speed. Torque varies as square of speed.	All centrifugal pumps, some fans & blowers. Note: Blower & fan power may vary as the fifth power of speed.	Power for maximum HP at maximum Speed. Set upper limit speed stop.
High-inertia loads.	Machines using flywheels to supply most of the operation energy. Punch presses, power shears, press brakes, etc.	General rules: Punch presses (a) 1 HP per 10 tons rated size. (b) If HP at maximum speed is known, select belt for maximum HP at 1/3 of maximum speed, whichever is the smaller.

Horsepower Ratings and Selection Guide Adjustable Center Distance Drives

Adjustable Center Distance Hi-Lo Pulleys are constant torque devices that are HP rated at the maximum output speed of the driven shaft. The TORQUE at the driven shaft is constant from maximum RPM to minimum RPM. The HORSEPOWER output of the driven shaft will decrease in direct proportion to the decrease in RPM at the driven shaft.

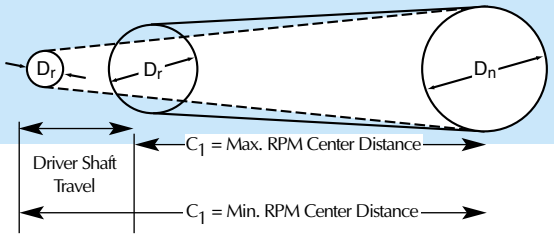
Example: The HP rating of an 8.75″ max. pitch diameter; 2.90″ min. pitch diameter adjustable pulley is 5.00. The driven shaft pitch diameter is 11.6″. The driver is a 1750 RPM 5.00 HP electric motor.

Driven RPM = $\frac{Dr}{Dn}$ x Driver RPM	**HP Output at Driven Shaft Formula 1**	**Torque output at Driven Shaft (in.-lbs.) Formula 2**
Max. = $\frac{8.75}{11.60}$ x 1750 = 1320	5.00	$\frac{5.00 \times 63025}{1320}$ = 239
Min. = $\frac{2.90}{11.60}$ x 1750 = 438	$\frac{239 \times 438}{63025}$ = 1.66	$\frac{1.66 \times 63025}{438}$ = 239

The Catalog Ratings cover service factors up to 1.2. For higher service factors, multiply the running horsepower by the appropriate factor (see next page) and select an adequately rated pulley.

Formula Terms

D_r = Driver Sheave Pitch Diameter (P.D.)
D_m = Driven Sheave Pitch Diameter (P.D.)
C_1 = Max. RPM Center Distance
C_2 = Min. RPM Center Distance
N_1 = Driver Shaft RPM
N_2 = Driven Shaft RPM
L = Belt Pitch Length



Drive Selection Example

A conveyor requires an input speed range of 450–1300 RPM and has a maximum running torque requirement of 210 in.-lbs. throughout the speed range. The specified driver is a 1750 RPM electric motor. The drive is considered normal duty operating eight to 16 hours per day.

Step 1. Determine the horsepower requirement

On a constant torque drive, the required horsepower capacity of the variable speed pulley and the motor is determined at the maximum RPM of the driven shaft.

$$HP = \frac{\text{Torque} \times \text{RPM}}{63025} = \frac{210 \times 1300}{63025} = 4.33$$

Required HP= Drive HP x Service Factor (see page 6)
example = 4.33 X 1.1 = 4.76

Step 2. Determine the Speed Range Ratio

$$\text{Speed Range Ratio} = \frac{N_2 max.}{N_2 min.} = \frac{1300}{450} = 2.89$$

Step 3. Determine the Hi-Lo Pulley Model

From the drive system's HP and Speed Range Ratio requirements a model 1590 Hi-Lo Pulley can be selected.

Model 1590 Specifications:

Horsepower	*5.00*
Max. P.D.	*8.75″*
Min. P.D.	*2.90″*
Ratio Range	*3:1*

Step 4. Determine Driven Sheave Diameter at Max. RPM

Formula 3: $N_2(max.) = \frac{D_r}{D_n} \times N_1$

example $D_n = \frac{N_1}{N_{2(max.)}} \times D_r(max.) = \frac{1750}{1300} \times 8.75 = 11.72$

Closest Standard Hi-Lo Companion Sheave is 23W12SK with 11.75 P.D.

From the catalog pre-engineered drive selection tables, you will find that a model 1590 with a 23WSK12 Sheave has a speed range of 434 RPM to 1303 RPM with a 1750 RPM driver.

Step 5. Determine Recommended Center Distance

Formula 4: $C_1 = \frac{D_n + 3(D_r)}{2}$ or C1 = Dn (whichever is greater)

example $C_1 = \frac{11.75 + 3(8.75)}{2} = 19.0$

Step 6. Determine the Belt Pitch Length

The belt pitch length is calculated when the drive is at its maximum speed position

Formula 5: $L = 2C_1 + 1.57(D_n + D_r) + \frac{(D_n - D_r)^2}{4C_1}$

example: $L = 2 \times 19.0 + 1.57(11.75 + 8.75) + \frac{(11.75 - 8.75)^2}{4 \times 19.0} = 70.30$

From the pulley specification tables; the model 1590 uses the 2322V series of variable speed belts. From the variable speed belt tables, you will note that the closest standard pitch length is 70.1

Step 7. Determine the actual Center Distance

Formula 6: $C_1 = 0.5 \left[L - 1.57(D_n + D_r) - \frac{(D_n - D_r)^2}{L} \right]$

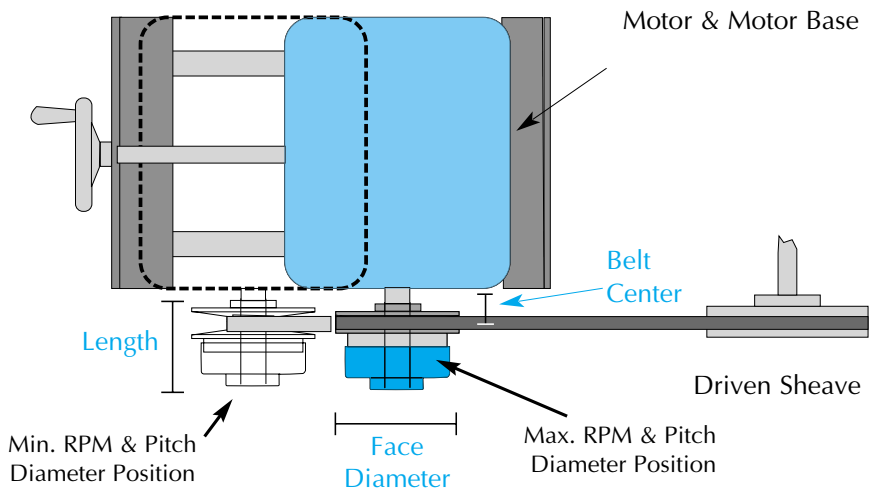
$$C_1 = 0.5 \left[70.1 - 1.57(11.75 + 8.75) - \frac{(11.75 - 8.75)^2}{70.1} \right] = 18.9$$

From the pre-engineered selection tables for the model 1590 pulley; Where the center distance numbers under the 2322V701 belt column intersects the 23W12SK sheave line, the center distance is 18.9″.

Step 8. Determine the proper size Hi-Lo Adjustable Motor Base

Refer to the motor base selection table on page 20. This table indicates the model base that can be used with each standard NEMA motor frame.

continued on next page



Hi-Lo Pulleys are not recommended for drives that are reversed without coming to a full stop.

Drive Selection Worksheet

In order to select an adjustable center distance drive system you need to know or determine:

1. The horsepower or running torque requirement of the drive. Hi-Lo Pulleys are rated in the catalog in conjunction with the rating of 1750 RPM and 1150 RPM electric motors.
2. The Service Factor of the drive. See charts below and on page 6 to determine other conditions that may affect drive selection.
3. The Diameters of the driver shaft and driven shaft.
4 The RPM of the driver shaft.
5. The required RPM Range or Speed Range Ratio (Max. RPM/Min. RPM) of the driven shaft.
6. The model Hi-Lo Pulley to be used, considering the Horsepower and Speed Range Ratio requirement of the drive.
7. The Driven Sheave Diameter after selecting the appropriate Hi-Lo pulley.
8. The Center Distance between the shafts at the maximum RPM position.
9. The Length of the Belt to be used in conjunction with the selected Hi-Lo Pulley, Driven Sheave and Center Distance.
10. The Size of the Adjustable Motor Base considering the selected Motor Frame Size and Hi-Lo Pulley's shaft center distance adjustment.

Table 1: Service Factors for Hi-Lo Pulleys

	Operating Hours Per Day		
Service Environment	**0–8**	**8–16**	**16–24**
NORMAL DUTY: Where infrequent starting and peak loads do not exceed 160% of normal running load	1.00	1.10	1.30
MODERATE DUTY: Where occasional starting and peak loads do not exceed 250% of normal running loads	1.20	1.30	1.35
HEAVY DUTY: Where occasional starting and peak loads are in excess of 250% of normal running loads OR where starting loads, peak loads and overloads occur frequently	1.25	1.35	1.50

The service factors are important in selecting a variable speed pulley that will provide adequate service life.
Multiply the maximum running torque or horsepower of the drive by the appropriate service factor to determine the proper capacity Hi-Lo Pulley.

Adjustable Center Distance Drives

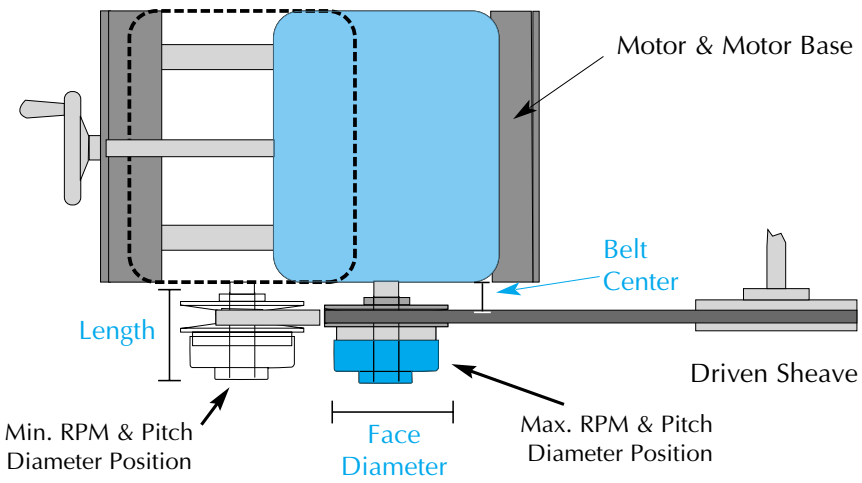
All dimensions are in inches

Rated HP	Pitch Ratio	Series Model	Max. Pitch Diameter	Min. Pitch Diameter.	Belt Center	Length	Face Diameter	Belt Size	Stock Bore Sizes
Single Face Moveable									
.75	2:1	**30 TBR**	3.13	1.57	.78	2.69	3.38	A	.5•.625•.75
1	2.5:1	**40 TBR**	4.00	1.60	.78	2.69	4.25	A	.5•.625•.75
1	3.4:1	**40TBR-W**	4.00	1.13	.78	2.69	4.25	A	.5
1.5	2.7:1	**50 TBR**	4.65	1.72	.78	3.19	5.00	B	.5•.625•.75•.875
2	2.5: 1	**57-20 TBR**	5.40	2.16	.78	3.06	5.75	B	.5•.625•.75•.875
3	2.5:1	**57 TBR**	5.40	2.16	1.09	3.88	5.75	B	.75•.875•.625•1•1.125
5	2:1	**66 TBR**	6.20	3.10	1.09	3.88	6.63	B	.75•.875•1•1.125
5	1.6:1	**86 TBR**	8.28	5.17	1.09	3.88	8.63	B	.75•.875•1•1.125
Double Face Moveable									
1	2.3:1	**DCV 140**	3.75	1.63	2.19	4.38	4.00	A	.5•.625•.75•.875
1.5	2.5:1	**DCV 150**	4.70	1.88	2.19	4.38	5.00	B	.5•.625•.75•.875
1.5	3:1	**DCW 1160**	5.90	1.98	2.19	4.38	6.13	1422V	.625•.75•.875
2	2.2:1	**DCV 157-20**	5.40	2.45	2.19	4.38	5.75	B	.5•.625•.75•.875
3	2.2:1	**DCV 157**	5.40	2.45	2.50	4.94	5.75	B	.75•.875•1•1.125
3	3:1	**DCW 1270**	7.28	2.42	2.87	5.88	7.50	1922	.75•.875•1•1.125
5	2.5:1	**DCV 167**	6.50	2.60	2.88	5.88	6.88	B	.75•.875•1•1.125
5	3:1	**DCW 1590**	8.75	2.90	3.53	7.06	9.00	2322V	1•1.125•1.25•1.375
10	3:1	**DCW 1711**	10.70	3.57	4.33	8.66	11.00	3226V	1•1.125•1.25•1.375
20	2.5:1	**DCW 2011**	10.65	4.26	4.88	9.75	11.00	3230HV	1.375•1.625•1.875
30	3:1	**DCW 2513**	12.60	4.20	4.88	9.75	13.00	4430V	1.375•1.625•1.875
Two Groove/Belt									
5	2:1	**DCV 257**	5.40	2.70	3.13	6.38	5.75	B (two)	.75•.875•1•1.125
7.5	1.75:1	**DCV 265**	6.50	3.70	3.75	7.53	7.00	C (two)	1•1.125•1.25•1.375
Asymmetric									
5	3:1	**A96**	9.30	3.10	1.82	6.56	9.69	23A	Collet No. 512
10	3:1	**A 112**	10.80	3.60	2.32	7.25	11.25	26A	Collet No. 512
20	2.5:1	**A 112-33**	10.70	4.30	2.27	7.44	11.25	33A	Collet No. 512
30	2.3:1	**A130-33**	12.40	5.40	2.52	7.44	13.00	33A	Collet No. 7713

To calculate the speed range of a Hi-Lo Variable Speed Pulley and a Companion Sheave, simply multiply the *Motor Speed* x *Maximum Pitch Diameter of the Variable Speed Pulley,* then divide that by the *Pitch Diameter of the Driven Sheave.* This gives you the *Maximum RPM.*

Divide this by the *Pitch Ratio* to find the *Minimum RPM.*
Example: DCW 1160 / 14W7 w/1750 motor: (1750 x 5.9) ÷ 6.8 = 1518 max RPM / 3 = 506 min RPM

One shaft is fixed and the other is moveable. The variable speed pulley is normally mounted on the moveable shaft and a fixed diameter sheave on the stationary shaft. By using an adjustable motor base, speed variation of the driven shaft is accomplished by mechanically changing the center distance between the shafts. An increase in center distance will pull the belt to a smaller diameter in the variable speed pulley. This increases the drive ratio and reduces the driven shaft RPM. A decrease in center distance allows the spring-loaded pulley faces to close and push the belt to a larger diameter.



TBR Series Adjustable Center Distance Drives

continued on next page

Drive Features

One Face Movable Design provides a simplified, economical and trouble free drive system. While belt misalignment is inherent, it is minimal using standard V-belts. The drive should be aligned with the belt at the mean diameter of the variable pulley and the recommended shaft center distance used as a minimum.

Aluminum Alloy Pulley Faces are light weight, corrosion resistant and have a high wearability compatibility between the belt and face surface. The model 86TBR uses close grained cast iron faces.

Permanent Lubrication. High load carrying precisely fit bronze bushings with specially formulated oil impregnation eliminate most fretting and corrosion problems.

Torque Sensing Design. Recognized by belt manufacturers as the ultimate in providing drive efficiency and drive component life.

Dimensions and Specifications • TBR Series

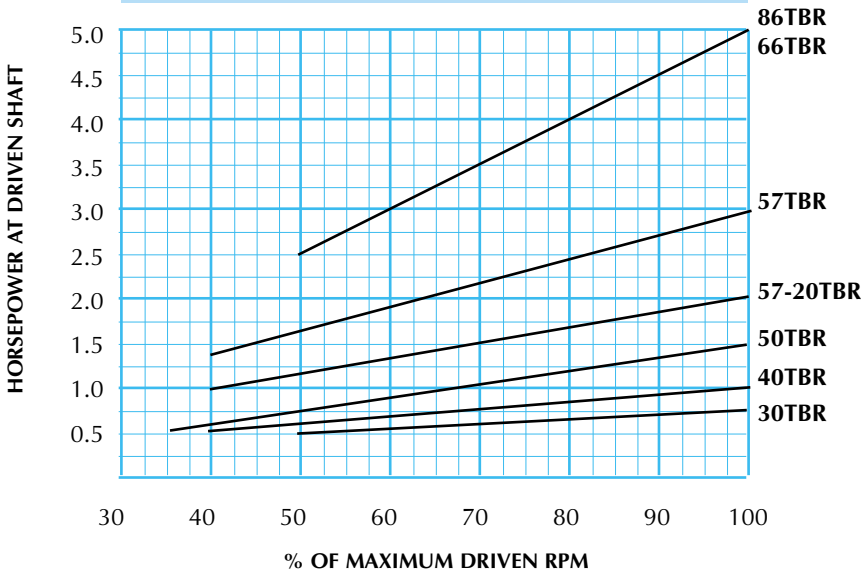
All dimensions are in inches

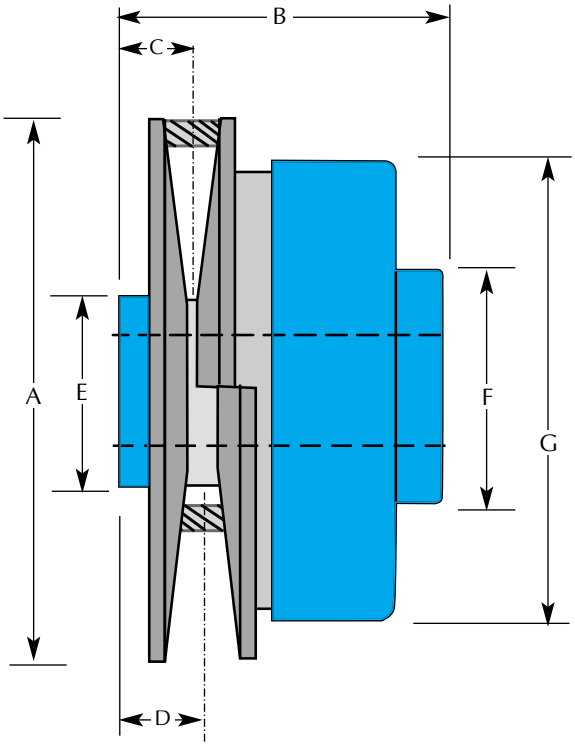
H P Rating 1750 RPM	H P Rating 1150 RPM	Torque Capacity 1 lb.-in.	Model Number	Max. P.D.	Min. P.D.	Ratio	Belt Size	A	B	C	D	E	F	G	Stock Thru Bores
.75	.5	27	**30TBR**	3.13	1.57	2:1	A	3.38	2.69	.78	.97	1.69	1.88	3.06	.5•.625•.75
1	.75	36	**40TBR**	4.00	1.60	2.5:1	A	4.25	2.69	.78	.97	1.69	1.88	3.06	.5•.625•.75
1	.75	36	**40TBR-W**	4.00	1.125	3.4:1	A	4.25	2.69	.78	.97	1.69	1.88	3.06	.5•.625
1.5	1	54	**50TBR**	4.65	1.72	2.7:1	B	5.00	3.06	.78	1.01	2.00	1.88	4.06	.5•.625•.75• .875
2	1.5	72	**57-20TBR**	5.40	2.16	2.5:1	B	5.75	3.06	.78	1.01	2.00	1.88	4.06	.5•.625•.75• .875
3	2	108	**57TBR**	5.40	2.16	2.5:1	B	5.75	3.88	1.09	1.33	2.44	2.25	5.07	.625•.75•.875•1•1.125
5	3	180	**66TBR**	6.20	3.10	2:1	B	6.63	3.88	1.09	1.33	2.31	2.25	5.07	.75•.875•1•1.125
5	3	180	**86TBR**	8.28	5.17	1.6:1	B	8.63	3.88	1.09	1.33	2.44	2.25	5.07	.75•.875•1•1.125

HP Ratings and Torque Capacities are at the Maximum P.D.

$$\text{Driven Torque} = \frac{\text{P.D. (Driven)}}{\text{Max P.D. (Driver)}} \times \text{Torque Capacity (Driver)}$$

Horsepower Curve (1750 RPM Input)





Pre-Engineered Belt and Center Distance Selection Chart • TBR Series

All dimensions are in inches

Driver Pulley Model	P.D. Driven Sheave	Driven Speed 1750RPM Motor Min.	1750RPM Motor Max.	1150RPM Motor Min.	1150RPM Motor Max.	Shaft Center Distance (Max. RPM Position) A Section Belt Sizes A26	A31	A33	A35	A37	A39	A41	A43	A45	A47	A49	A53	A56
	3.2	853	1712	561	1125	8.7	11.2	12.2	13.2	14.2	15.2	16.2	17.2	18.2	19.2	20.2	22.2	23.7
	3.8	718	1441	472	947	8.2	10.7	11.7	12.7	13.7	14.7	15.7	16.7	17.7	18.7	19.7	21.7	23.2
	4.4	621	1245	408	818	7.7	10.2	11.2	12.2	13.2	14.2	15.2	16.2	17.2	18.2	19.2	21.2	22.7
	5.0	546	1096	359	720	7.2	9.6	10.7	11.7	12.7	13.7	14.7	15.7	16.7	17.7	18.7	20.7	22.2
30TBR	5.6	488	978	320	643	6.7	9.2	10.2	11.2	12.2	13.2	14.2	15.2	16.2	17.2	18.2	20.2	21.7
	6.2	440	884	289	581		8.8	9.7	10.7	11.7	12.7	13.7	14.7	15.7	16.7	17.7	19.7	21.2
	7.0	690	783	256	514		8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	19.0	20.6
	8.2	333	668	219	439			7.9	8.9	9.9	11.0	12.0	13.0	14.0	15.0	16.0	18.0	19.5
	9.0	303	609	199	400				8.2	9.2	10.2	11.2	12.2	13.2	14.3	15.3	17.3	18.8
	10.6	258	517	169	340						8.7	9.7	10.7	11.8	12.8	13.8	15.9	17.4
	3.2	875	2188	575	1438	8.0	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5	21.5	23.0
	3.8	737	1842	484	1211	7.5	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	21.0	22.5
	4.4	636	1591	418	1046	7.0	9.6	10.6	11.6	12.6	13.6	14.6	15.6	16.6	17.6	18.6	20.6	22.1
	5.0	560	1400	368	920	6.6	9.1	10.1	11.1	12.1	13.1	14.1	15.1	16.1	17.1	18.1	20.1	21.6
40TBR	5.6	500	1250	329	821	6.1	8.6	9.6	10.6	11.6	12.6	13.6	14.6	15.6	16.6	17.6	19.7	21.1
	6.2	452	1129	297	742		8.1	9.1	10.1	11.1	12.1	13.1	14.1	15.1	16.1	17.1	19.1	20.6
	7.0	400	1000	263	657			8.4	9.4	10.4	11.4	12.4	13.4	14.4	15.4	16.4	18.4	19.9
	8.2	342	854	224	561				8.3	9.4	10.4	11.4	12.4	13.4	14.4	15.4	17.4	18.9
	9.0	311	778	204	511					8.6	9.6	40.7	11.7	12.7	13.7	14.7	16.7	18.2
	10.6	264	660	174	434							9.2	10.2	11.2	12.2	13.3	15.3	16.8

Driver Pulley Model	P.D. Driven Sheave	Driven Speed 1750RPM Motor Min.	1750RPM Motor Max.	1150RPM Motor Min.	1150RPM Motor Max.	Shaft Center Distance (Max. RPM Position) B Section Belt Sizes B35	B38	B42	B46	B48	B50	B53	B56	B60	B64	B68	B71	B75
	4.0	726	2034	477	1336	11.6	13.1	15.1	17.1	18.1	19.1	20.6	22.1	24.1	26.0	28.8	29.6	31.6
	4.6	631	1769	415	1162	11.1	12.6	14.6	16.6	17.6	18.6	20.1	21.6	23.6	25.6	27.6	29.1	31.1
	5.0	581	1628	382	1069	10.8	12.4	14.3	16.3	17.3	18.3	19.8	21.3	23.3	25.3	27.3	28.8	30.8
	5.6	519	1453	341	954	10.3	11.8	13.8	15.8	16.8	17.9	19.4	20.9	22.9	24.9	26.9	28.4	30.3
50TBR	6.2	469	1313	308	863	9.9	11.4	13.4	15.4	16.4	17.4	18.9	20.4	22.4	24.4	26.4	27.9	29.9
	6.8	427	1197	281	786	9.4	10.9	12.9	14.9	15.9	16.9	18.4	19.9	21.9	23.9	25.9	27.4	29.4
	7.4	393	1100	258	722	8.8	10.4	12.4	14.4	15.4	16.4	17.9	19.4	21.4	23.4	25.4	26.9	28.9
	8.0	363	1017	239	668	8.3	9.8	11.8	13.9	14.9	15.9	17.4	18.9	20.9	22.9	24.9	26.4	28.4
	9.4	309	866	203	569			10.6	12.6	13.6	14.7	16.2	17.7	19.7	21.7	23.7	25.2	27.2
	11.0	264	740	174	431				11.2	12.2	13.2	14.8	16.3	18.3	20.3	22.3	23.8	25.9
	5.2	740	1817	487	1164	10.1	11.6	13.6	15.6	16.6	17.6	19.0	20.6	22.6	24.6	26.6	28.1	30.1
	5.6	688	1688	452	1109	9.8	11.3	13.3	15.3	16.3	17.3	18.8	20.3	22.3	24.3	26.3	27.8	29.8
	6.2	621	1524	408	1002	9.3	10.8	12.8	14.8	15.8	16.8	18.3	19.8	21.8	23.8	25.8	27.3	29.3
	6.8	566	1390	372	913	8.8	10.3	12.3	14.3	15.3	16.3	17.8	19.3	21.3	23.3	25.3	26.8	28.8
57TBR	7.4	520	1277	342	839	8.3	9.8	11.8	13.8	14.8	15.8	17.3	18.8	20.8	22.8	24.8	26.3	28.3
	8.0	481	1181	316	776		9.3	11.3	13.3	14.3	15.3	16.8	18.3	20.3	22.3	24.3	25.8	27.8
57-20	9.4	410	1005	269	661			10.1	12.1	13.1	14.1	15.6	17.1	19.2	21.2	23.2	24.7	26.7
TBR	11.0	350	859	230	565					11.7	12.7	14.2	15.8	17.8	19.8	21.8	23.3	25.3
	12.4	311	762	204	501								13.0	16.5	18.6	20.6	22.1	24.1
	13.6	283	695	186	457									15.4	17.5	19.5	21.0	23.1
	5.6	969	1938	637	1274	9.1	10.6	12.6	14.6	15.6	16.6	18.1	19.6	21.6	23.6	25.6	27.1	29.1
	6.2	875	1750	575	1150	8.7	10.2	12.2	14.2	15.2	16.2	17.7	19.2	21.2	23.2	25.2	26.7	28.7
	6.8	798	1596	524	1114	8.2	9.7	11.7	13.7	14.7	15.7	17.2	18.7	20.7	22.7	24.7	26.2	28.2
	7.4	733	1466	482	964	7.7	9.2	11.2	13.2	14.2	15.2	16.7	18.2	20.2	22.2	24.2	25.7	27.7
	8.0	678	1356	446	891		8.7	10.7	12.7	13.7	14.7	16.2	17.7	19.7	21.7	23.7	25.2	27.2
66TBR	9.4	577	1154	379	758			9.5	11.6	12.6	13.6	15.1	16.6	18.6	20.6	22.6	24.1	26.1
	11.0	493	986	324	648					11.2	12.2	13.7	15.2	17.2	19.2	21.2	22.7	24.8
	12.4	438	875	288	573							12.5	14.0	16.0	18.0	20.0	21.5	23.6
	13.6	399	798	262	524									14.9	16.9	19.0	20.5	22.5
	15.4	352	705	232	463										15.3	17.3	18.9	20.9
	7.4	1223	1958	803	1287		7.6	9.6	11.6	12.6	13.6	15.2	16.6	18.6	20.6	22.6	24.1	26.1
	8.0	1131	1811	743	1190			9.1	11.1	12.1	13.1	14.6	16.1	18.1	20.1	22.1	23.6	25.6
	8.6	1052	1685	691	1107				10.7	11.7	12.7	14.2	15.7	17.7	19.7	21.7	23.2	25.2
86TBR	9.4	963	1542	633	1013				10.0	11.0	12.0	13.5	15.0	17.0	19.0	21.0	22.5	24.5
	11.0	823	1317	541	866							12.2	13.7	15.7	17.7	19.7	21.2	23.2
	12.4	730	1169	480	768								12.5	14.5	16.5	18.5	20.1	22.1
	13.6	665	1065	437	700									13.5	15.5	17.5	19.0	22.1
	15.4	588	941	386	618											16.0	17.5	19.5

DCV Series Adjustable Center Distance Drives

continued on next page

Drive Features

Two Face Movable Design (for standard V-belts)
Maintains belt alignment between the variable speed pulley and the companion sheave. This is an important feature with close center distance drives. Models 257 and 265 are an exception, however, and should use recommended shaft center distances.

Pulley Face Material
Models 140, 150 and 157 use a lightweight, corrosion-resistant, aluminum alloy material. Models 167, 257 and 265 use close-grained, cast-iron faces.

Permanently Lubricated Movable Face Bushings
High load carrying, precisely fit bronze bushings with a specially formulated oil impregnation are used to eliminate most fretting and corrosion problems. For severe corrosion conditions, the pulley shaft can be treated to resist the particular corrosion condition.

Torque Sensing Design
Belt tension is regulated to the load requirements. Bushing wear is reduced by the peripheral support of the cam followers. There are no torque carrying keys.

Dimensions and Specifications • DCV Series

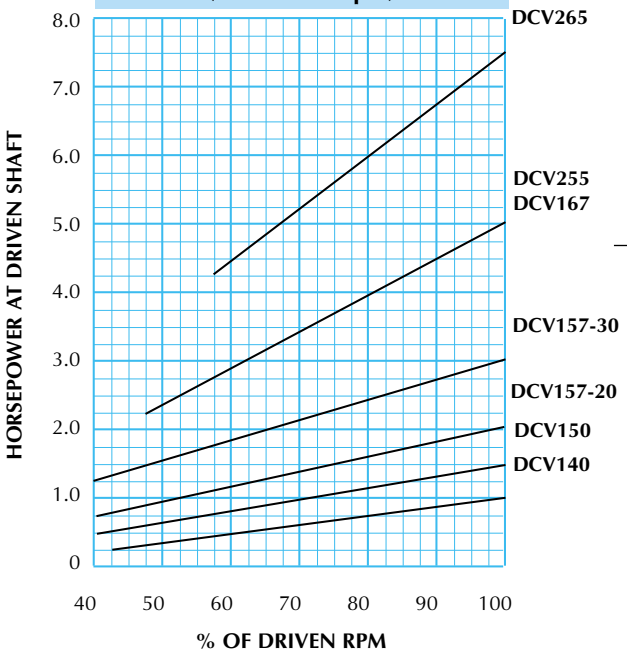
All dimensions are in inches

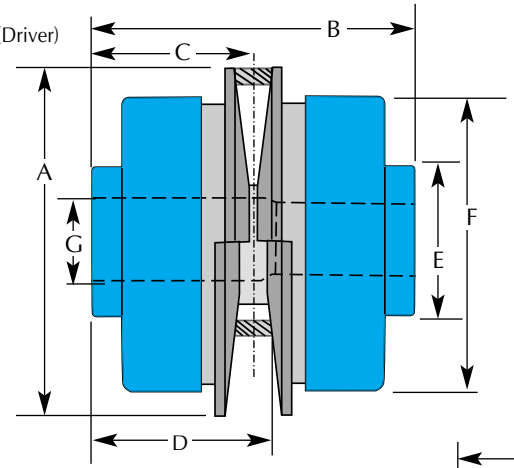
HP Rating 1750 RPM	HP Rating 1150 RPM	Torque Capacity 1 lb.-in.	Model Number	Max. P.D.	Min. P.D.	Ratio	Belt Size	A	B	C	D	E	F	Stock Bores G	Shaft Travel (inches)
1	.75	36	**DCV140**	3.75	1.63	2.3:1	A	4.00	4.38	2.19	2.25	1.88	4.06	.5•.625•.75•.875	1.6
1.5	1	54	**DCV150**	4.70	1.88	2.5:1	B	5.00	4.38	2.19	2.25	2.00	4.06	.5•.625•.75•.875	2.1
2	1.5	72	**DCV157-20**	5.40	2.45	2.2:1	B	5.75	4.38	2.19	2.25	2.00	4.06	.5•.625•.75•.875	2.2
3	2	108	**DCV157**	5.40	2.45	2.2:1	B	5.75	4.94	2.50	2.75	2.25	5.07	.75•.875•1•1.125	2.2
5	3	180	**DCV167**	6.50	2.60	2.5:1	B	6.88	5.88	2.88	3.25	2.25	5.07	.75•.875•1•1.125	2.8
5	3	180	**DCV257**	5.40	2.70	2.0:1	B	5.75	6.38	3.13	3.50	2.25	5.07	.75•.875•1•1.125	2.2
7.5	5	270	**DCV265**	6.50	3.70	1.75:1	C	7.00	7.53	3.75	4.50	3.88	6.56	1•1.125•1.25•1.375	2.1

HP Ratings and Torque Capacities are at the Maximum P.D.

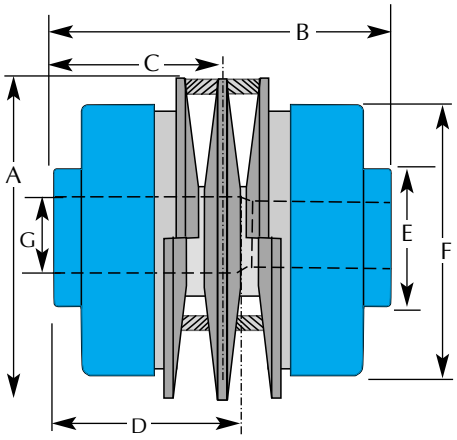
$$\text{Driven Torque Capacity} = \frac{\text{P.D. (Driven Sheave)}}{\text{Max P.D. (Driver)}} \times \text{Torque Capacity (Driver)}$$

Horsepower Curve (1750 RPM Input)





Models
DCV140
DCV150
DCV157
DCV157-20
DCV167



Models
DCV257,
DCV265

Pre-Engineered Belt and Center Distance Selection Chart • DCV Series

All dimensions are in inches

A Section Belt Sizes

Driver Pulley Model	P.D. Driven Sheave	Driven Speeds 1750 RPM Motor Min.	1750 RPM Motor Max.	1150 RP Motor Min.	1150 RP Motor Max.	Shaft Center Distance (Max. RPM Position) A26	A31	A33	A35	A37	A39	A41	A43	A45	A47	A49	A53	A56
	3.2	892	2051	586	1348	8.2	10.7	11.7	12.7	13.7	14.7	15.7	16.7	17.7	18.7	19.7	21.7	23.2
	3.8	751	1727	493	1135	7.7	10.2	11.2	12.2	13.2	14.2	15.2	16.2	17.2	18.2	19.2	21.2	22.7
	4.4	649	1492	426	980	7.2	9.7	10.7	11.7	12.7	13.7	14.7	15.7	16.7	17.7	18.7	20.7	22.2
	5.0	571	1313	375	863	6.8	9.3	10.3	11.3	12.3	13.3	14.3	15.3	16.3	17.3	18.3	20.3	21.8
140	5.6	510	1172	335	770	6.3	8.8	8.9	10.8	11.8	12.8	13.8	14.8	15.8	16.8	17.8	19.8	21.3
	6.2	408	1059	302	696		8.3	9.3	10.6	11.3	12.3	13.3	14.3	15.3	16.3	17.3	19.3	20.8
	7.0	408	938	268	616			8.6	9.6	10.3	11.6	12.6	13.6	14.6	15.6	16.6	18.6	20.1
	8.2	348	800	229	526					9.6	10.6	11.6	12.6	13.6	14.6	15.6	17.6	19.1
	9.0	317	729	208	479							10.8	11.8	12.8	13.9	14.9	16.9	18.4
	10.6	269	619	177	407									11.4	12.4	13.4	15.5	17.0

B Section Belt Sizes

Driver Pulley Model	P.D. Driven Sheave	Driven Speeds 1750 RPM Motor Min.	1750 RPM Motor Max.	1150 RP Motor Min.	1150 RP Motor Max.	Shaft Center Distance (Max. RPM Position) B35	B38	B42	B46	B48	B50	B53	B56	B60	B64	B68	B71	B75
	4.0	822	2056	541	1351	11.6	13.1	15.1	17.1	18.1	19.1	20.6	22.1	24.1	26.0	28.8	29.6	31.6
	4.6	715	1778	470	1175	11.1	12.6	14.6	16.6	17.6	18.6	20.1	21.6	23.6	25.6	27.6	29.1	31.1
	5.0	633	1645	416	1081	10.8	12.3	14.3	16.3	17.3	18.3	19.8	21.3	23.3	25.3	27.3	28.8	30.8
	5.6	588	1469	386	965	10.3	11.8	13.8	15.8	16.8	17.9	19.4	20.9	22.9	24.9	26.9	28.4	30.3
150	6.2	531	1327	349	871	9.9	11.4	13.4	15.4	16.4	17.4	18.9	20.4	22.4	24.4	26.4	27.9	29.9
	6.8	484	1210	318	795	9.4	10.9	12.9	14.9	15.9	16.9	18.4	19.9	21.9	23.9	25.9	27.4	29.4
	7.4	445	1112	292	730	8.8	10.4	12.4	14.4	15.4	16.4	17.9	19.4	21.4	23.4	25.4	26.9	28.9
	8.0	411	1028	270	676		9.8	11.8	13.9	14.9	15.9	17.4	18.9	20.9	22.9	24.9	26.4	28.4
	9.4	350	875	230	575			10.6	12.6	13.6	14.7	16.2	17.7	19.7	21.7	23.7	25.2	27.2
	11.0	299	747	197	491					12.2	13.2	14.8	16.3	18.3	20.3	22.3	23.8	25.9
	5.2	826	1817	543	1194	10.1	11.6	13.6	15.6	16.6	17.6	19.0	20.6	22.6	24.6	26.6	28.1	30.1
	5.6	767	1688	504	1109	9.8	11.3	13.3	15.3	16.3	17.3	18.8	20.3	22.3	24.3	26.3	27.8	29.8
	6.2	693	1524	455	1002	9.3	10.8	12.8	14.8	15.8	16.8	18.3	19.8	21.8	23.8	25.8	27.3	29.3
	6.8	632	1390	415	913	8.8	10.3	12.3	14.3	15.3	16.3	17.8	19.3	21.3	23.6	25.2	26.8	28.8
157-20	7.4	581	1277	381	839	8.3	9.8	11.8	13.8	14.8	15.8	17.3	18.8	20.8	22.8	24.8	26.3	28.3
157	8.0	537	1181	353	776		9.3	11.3	13.3	14.3	15.3	16.8	18.3	20.3	22.3	24.3	25.8	27.8
	9.4	457	1005	300	661			10.1	12.1	13.1	14.1	15.6	17.1	19.2	21.2	23.2	24.7	26.7
	11.0	391	859	257	565					11.7	12.7	14.2	15.8	17.8	19.8	21.8	23.3	25.3
	12.6	346	762	228	501								13.0	16.5	18.6	20.6	22.1	24.1
	13.6	316	695	208	457									15.4	17.5	19.5	21.0	23.1
	5.6	812	2031	534	1335	8.9	10.4	12.4	14.4	15.4	16.4	17.9	19.4	21.4	23.4	25.4	26.9	28.9
	6.2	734	1835	482	1206		9.9	11.9	13.9	14.9	15.9	17.4	18.9	20.9	22.9	24.9	26.4	28.4
	6.8	669	1673	440	1099		9.5	11.5	13.5	14.5	15.5	17.0	18.5	20.5	22.5	24.5	26.0	28.0
	7.4	615	1537	404	1010		9.0	11.0	13.0	14.0	15.0	16.5	18.0	20.0	22.0	24.0	25.5	26.5
167	8.0	569	1422	374	934			10.5	12.5	13.5	14.5	16.0	17.5	19.5	21.5	23.5	25.0	27.0
	9.4	484	1210	318	795				11.3	12.3	13.3	14.8	16.3	18.4	20.4	22.4	23.9	25.9
	11.0	414	1034	272	680						12.0	13.5	15.0	17.0	19.0	21.0	22.5	24.5
	12.4	367	917	241	603								13.8	15.8	17.8	19.8	21.3	23.3
	13.6	335	836	220	550									14.7	16.7	18.8	20.3	22.3
	15.4	296	739	194	485											17.1	18.7	20.7
	5.2	865	1817	569	1194	10.1	11.6	13.6	15.6	16.6	17.6	19.0	20.6	22.6	24.6	26.6	28.1	30.1
	5.6	804	1688	528	1109	9.8	11.3	13.3	15.3	16.3	17.3	18.8	20.3	22.3	24.3	26.3	27.8	29.8
	6.2	729	1524	477	1002	9.3	10.8	12.8	14.8	15.8	16.8	18.3	19.8	21.8	23.8	25.8	27.3	29.3
	6.8	662	1390	435	913	8.8	10.3	12.3	14.3	15.3	16.3	17.8	19.3	21.3	23.3	25.3	26.8	28.8
257	7.4	608	1277	400	839	8.3	9.8	11.8	13.8	14.8	15.8	17.3	18.8	20.8	22.8	24.8	26.3	28.3
	8.0	562	1181	370	776		9.3	11.3	13.3	14.3	15.3	16.8	18.3	20.0	22.3	24.3	25.8	27.8
	9.4	479	1005	315	661			10.1	12.1	13.1	14.1	15.6	17.1	19.2	21.2	23.2	24.7	26.7
	11.0	409	859	269	565					11.7	12.7	14.2	15.8	17.8	19.8	21.8	23.3	25.3
	12.6	363	762	239	501								13.0	16.5	18.6	20.6	22.1	24.1
	13.6	331	695	217	457									15.4	17.5	19.5	21.0	23.1

C Section Belt Sizes

Driver Pulley Model	P.D. Driven Sheave	Driven Speeds 1750 RPM Motor Min.	1750 RPM Motor Max.	1150 RP Motor Min.	1150 RP Motor Max.	Shaft Center Distance (Max. RPM Position) C51	C55	C60	C68	C72	C75	C78	C81	C85	C90	C96	C100	101
	7.0	929	1625	610	1068	15.9	18.4	20.9	24.9	26.9	28.4	29.9	31.4	33.4	35.9	38.9	40.9	41.4
	8.0	813	1422	534	934	15.0	17.5	20.0	24.1	26.1	27.6	29.1	30.6	32.6	35.1	38.1	40.1	40.6
	9.0	722	1264	474	831	14.2	16.7	19.2	23.2	25.2	26.7	28.2	29.7	31.7	34.2	37.3	39.3	39.8
	10.0	650	1138	427	748	13.4	15.9	18.4	22.4	24.4	25.9	27.4	28.9	30.9	33.4	36.4	38.4	38.9
257	11.0	591	1034	388	680	12.5	15.0	17.6	21.6	23.6	25.1	26.6	28.1	30.1	32.6	35.6	37.6	38.1
	12.0	542	948	356	623		14.2	16.7	20.7	22.7	24.2	25.7	27.2	29.3	31.8	34.8	36.8	37.3
	13.0	500	875	329	575		13.3	15.8	19.8	21.9	23.4	24.9	26.4	28.4	30.9	33.9	35.9	36.4
	14.0	464	813	305	534			14.9	19.0	21.0	22.5	24.0	25.5	27.5	30.1	33.1	35.1	35.6
	16.0	406	711	267	467				17.2	19.2	20.7	22.2	23.7	25.8	28.3	31.3	33.3	33.9

DCW Series Adjustable Center Distance Drives

continued on next page

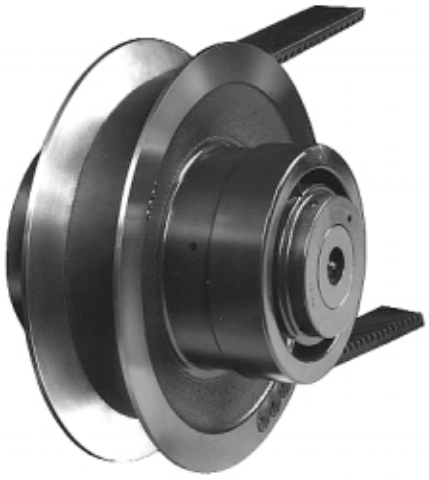
Drive Features

Two Face Moveable Design for variable speed belts
Maintains belt alignment between the variable speed pulley and the companion sheave. The wider variable speed belts allow a greater speed ratio change than standard V-belts, while maintaining a match between the included angle of the pulley faces and the belt.

Pulley Face Material
Models 1160 and 1270 use a lightweight, corrosion-resistant aluminum alloy material. Models 1590, 1711, 2011 and 2513 use close-grained, cast-iron faces.

Permanently Lubricated Moveable Face Bushings
High load carrying precisely fit bronze bushings with a specially formulated oil impregnation are used to eliminate most fretting and corrosion problems. For severe corrosion conditions the pulley shafts can be treated to resist the particular corrosion condition.

Torque-Sensing Design
Belt tension is regulated to the load requirements. Bushing wear is reduced by the peripheral support of the cam followers. There are no torque carrying keys.



Dimensions and Specifications • DCW Series

All dimensions are in inches

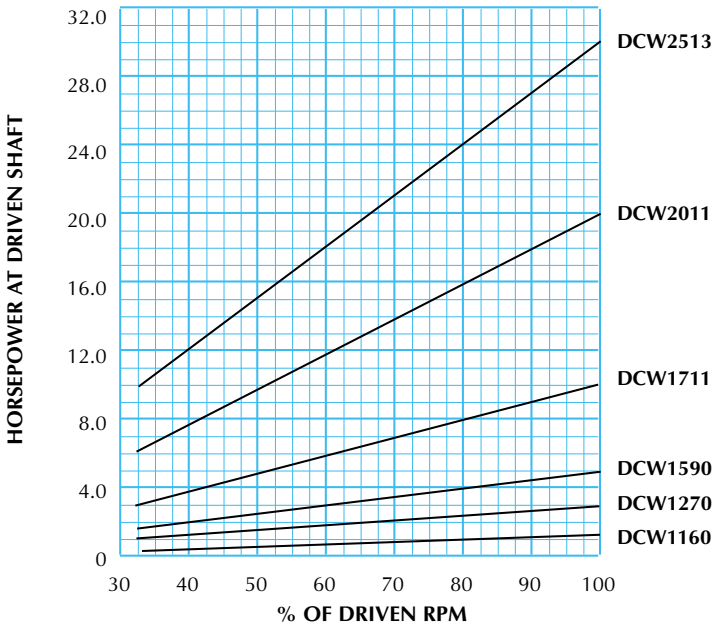
HP Rating 1750 RPM	HP Rating 1150 RPM	Torque Capacity 1 lb.-in.	Model Number	Max. P.D.	Min. P.D.	Ratio	Belt Size	A	B	C	D	E	F	Stock Bores G	Shaft Travel (inches)
1.5	1	54	1160	5.90	1.98	3:1	1422V	6.13	4.38	2.19	2.25	1.88	4.06	.625•.75•.875	2.90
3	2	108	1270	7.28	2.42	3:1	1922V	7.50	5.88	2.87	3.25	2.25	5.07	.75•.875•1•1.125	3.40
5	3	180	1590	8.75	2.90	3:1	2322V	9.00	7.06	3.53	3.87	4.25	7.13	.875•1•1.125, 1.25•1.375	4.30
10	7.5	360	1711	10.70	3.57	3:1	3226V	11.00	8.66	4.33	4.50	4.25	7.13	1.125•1.25•1.375	5.00
20	15	720	2011	10.65	4.26	2.5:1	3230HV	11.00	9.75	4.88	4.62	4.25	7.13	1.375•1.625•1.875	4.60
30	20	1080	2513	12.60	4.20	3:1	4430V	13.00	9.75	4.88	4.62	4.25	7.13	1.375•1.625•1.875	5.90

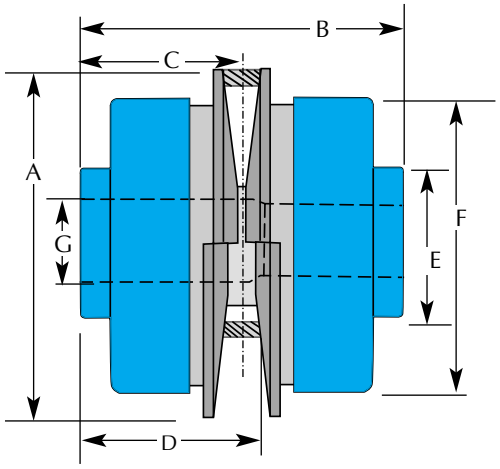
(1.375
5,1.87

HP Ratings and Torque Capacities are at the Maximum P.D.

$$\text{Driven Torque Capacity} = \frac{\text{P.D. (Driven Sheave)}}{\text{Max. P.D. (Driver)}} \times \text{Torque Capacity (Driver)}$$

Horsepower Curve • 1750 RPM Input





Pre-Engineered Belt and Center Distance Selection Chart • DCW Series

All dimensions are in inches

Driver Pulley Model	Driven Sheave No.	Driven Sheave P.D.	Driven Speeds 1750 RPM Min.	1750 RPM Max.	1150 RPM Min.	1150 RPM Max	Belt Size 1422V • Shaft Center Distance (Max. RPM Position) 300	340	360	400	440	460	480	540	600	660	720	780
	14W5.5SH	5.3	649	1948	427	1280	6.2	8.2	9.2	11.2	13.2	14.2	15.2	18.2	21.2	24.2	27.2	30.2
	14W6SH	5.8	563	1780	390	1170		7.8	8.8	10.8	12.8	13.8	14.8	17.8	20.8	23.6	26.8	29.8
	14W7SH	6.8	506	1518	333	998			7.9	9.9	11.9	12.9	13.9	16.9	19.9	22.9	25.9	28.9
	14W8SH	7.8	441	1324	290	870				9.2	11.2	12.2	13.2	16.2	19.2	22.2	25.2	28.2
1160	14W9SH	8.8	391	1173	257	771					10.4	11.4	12.4	15.4	18.4	21.4	24.4	27.4
	14W10SH	9.8	351	1054	231	692						10.6	11.6	14.6	17.6	20.6	23.6	26.6
	14W11SH	10.8	319	956	209	628								13.7	16.7	19.7	22.7	25.7
	14W12SH	11.8	292	875	192	575								12.8	15.8	18.8	21.9	24.9
	14W14SH	13.8	249	748	164	492										17.1	20.1	23.1

Driver Pulley Model	Driven Sheave No.	Driven Sheave P.D.	Driven Speeds 1750 RPM Min.	1750 RPM Max.	1150 RPM Min.	1150 RPM Max.	Belt Size 1922V • Shaft Center Distance (Max. RPM Position) 403	426	454	484	526	544	604	646	686	721	751	806
	19W7SK	6.78	599	1781	390	1170	9.4	10.6	12.0	13.5	15.6	16.5	19.5	21.6	23.6	25.3	26.8	29.6
	19W8SK	7.78	517	1552	340	1020	8.6	9.8	11.2	12.7	14.8	15.7	18.7	20.8	22.8	24.5	26.0	28.8
	19W9SK	8.78	458	1375	301	904			10.4	11.9	14.0	14.9	17.9	20.0	22.0	23.7	25.2	28.0
1270	19W10SK	9.78	412	1235	270	811				11.0	13.1	14.0	17.0	19.1	21.1	22.9	24.4	27.2
	19W12SK	11.78	342	1025	225	674						12.3	15.3	17.5	19.5	21.2	22.7	25.5
	19W14SK	13.78	292	876	192	576							13.6	15.7	17.7	19.5	21.0	23.8
	19W16SK	15.78	255	765	168	503									15.9	17.7	19.2	22.0

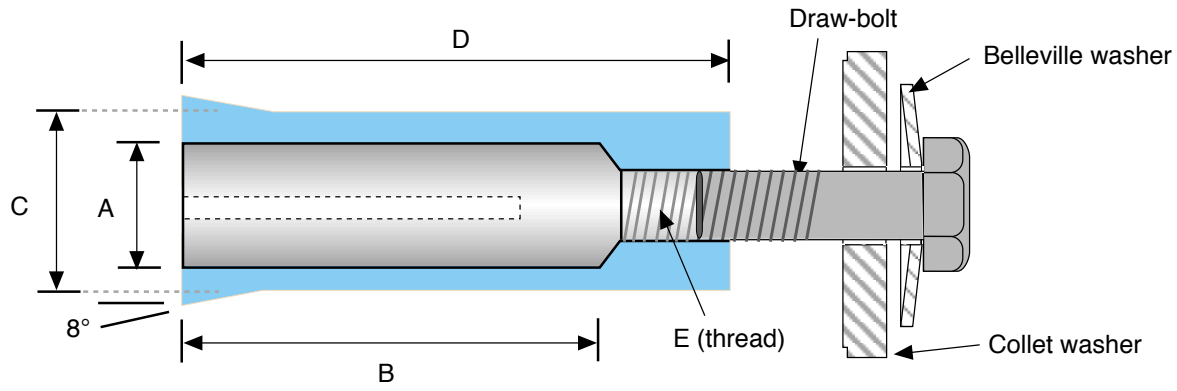
Driver Pulley Model	Driven Sheave No.	Driven Sheave P.D.	Driven Speeds 1750 RPM Min.	1750 RPM Max.	1150 RPM Min.	1150 RPM Max.	Belt Size 2322V • Shaft Center Distance (Max. RPM Position) 441	461	481	521	541	601	621	661	681	701	721	801
	23W7SK	6.75	756	2269	497	1491	9.8	10.8	11.8	13.8	14.8	17.8	18.9	20.9	21.9	22.9	23.9	27.9
	23W8SK	7.75	659	1976	433	1298		10.1	11.1	13.1	14.1	17.1	18.1	20.1	21.1	22.1	23.1	27.1
	23W9SK	8.75	583	1750	383	1150			10.3	12.3	13.3	16.3	17.3	19.3	20.3	21.3	22.3	26.3
1590	23W10SK	9.75	524	1571	344	1032				11.5	12.5	15.5	16.5	18.5	19.5	20.5	21.5	25.5
	23W12SK	11.75	434	1303	286	856						13.9	14.9	16.9	17.9	18.9	19.9	23.9
	23W14SK	13.75	371	1114	244	732							13.2	15.2	16.2	17.2	18.2	22.2
	23W16SK	15.75	324	972	213	639								13.4	14.5	15.5	16.5	20.5

Driver Pulley Model	Driven Sheave No.	Driven Sheave P.D.	Driven Speeds 1750 RPM Min.	1750 RPM Max.	1150 RPM Min.	1150 RPM Max.	Belt Size 3226V • Shaft Center Distance (Max. RPM Position) 514	545	585	603	663	723	783	843	903	963	1023	1083
	32W99SF	9.6	650	1950	427	1282		11.3	13.3	14.2	17.2	20.2	23.2	26.2	29.2	32.2	35.2	38.2
	32W104SF	10.1	618	1854	406	1218			12.9	13.8	16.8	19.8	22.8	25.8	28.8	31.8	34.8	37.8
	32W114SF	11.1	562	1687	370	1109			12.1	13.0	16.0	19.0	22.0	25.0	28.0	31.0	34.0	37.0
	32W124SF	12.1	516	1548	339	1017				12.2	15.2	18.2	21.2	24.2	27.2	30.2	33.2	36.2
1711	32W134SF	13.1	477	1429	313	939					14.4	17.4	20.4	23.4	26.4	29.4	32.4	35.4
	32W144SF	14.1	443	1328	291	873						16.6	19.6	22.6	25.6	28.6	31.6	34.6
	32W154SF	15.1	413	1240	272	815						15.8	18.8	21.8	24.8	27.8	30.8	33.8
	32W164SF	16.1	388	1163	255	764						14.9	17.9	20.9	24.0	27.0	30.0	33.0
	32W184SF	18.1	345	1035	227	680							16.2	19.2	22.2	25.3	28.3	31.3
	32W204SF	20.1	311	932	204	612								17.4	20.5	23.5	26.5	29.6

Driver Pulley Model	Driven Sheave No.	Driven Sheave P.D.	Driven Speeds 1750 RPM Min.	1750 RPM Max.	1150 RPM Min.	1150 RPM Max.	Belt Size 3230V • Shaft Center Distance (Max. RPM Position) 603	620	644	656	670	685	702	723	821	856	931	960
	32W99SF	9.5	785	1962	516	1289	14.3	15.1	16.3	16.9	17.6	18.4	19.2	20.3	25.2	26.9	30.7	32.1
	32W104SF	10.0	746	1864	490	1225	13.9	14.7	15.9	16.5	17.2	18.0	18.8	19.9	24.8	26.5	30.3	31.7
	32W114SF	11.0	678	1694	445	1113	13.2	14.0	15.2	15.8	16.5	17.3	18.1	19.2	24.1	25.8	29.6	31.0
	32W124SF	12.0	621	1553	408	1021		13.2	14.4	15.0	15.7	16.5	17.3	18.4	23.3	25.0	28.8	30.2
2011	32W134SF	13.0	574	1434	377	942			13.6	14.2	14.9	15.6	16.5	17.5	22.5	24.2	28.0	29.4
	32W144SF	14.0	533	1331	350	875					14.1	14.8	15.7	16.7	21.6	23.4	27.1	28.6
	32W154SF	15.0	497	1243	327	817							14.8	15.9	20.8	22.6	26.3	27.8
	32W164SF	16.0	466	1165	306	766								15.0	20.0	21.7	25.5	26.9
	32W184SF	18.0	414	1035	272	680									18.2	20.2	23.8	25.2
	32W204SF	20.0	373	932	245	612									16.5	18.2	22.0	23.5

Driver Pulley Model	Driven Sheave No.	Driven Sheave P.D.	Driven Speeds 1750 RPM Min.	1750 RPM Max.	1150 RPM Min.	1150 RPM Max.	Belt Size 4430V • Shaft Center Distance (Max. RPM Position) 670	718	730	740	767	790	850	910	970	1030	1090	1150
	44W10SF	10.0	735	2205	483	1449	15.7	18.1	18.7	19.2	20.6	21.7	24.7	27.7	30.7	33.7	36.7	39.7
	44W11SF	11.0	668	2004	439	1317	15.0	17.4	18.0	18.5	19.8	21.0	24.0	27.0	30.0	33.0	36.0	39.0
	44W12SF	12.0	613	1838	403	1208	14.2	16.6	17.2	17.7	19.0	20.2	23.2	26.2	29.2	32.2	35.2	38.2
	44W13SF	13.0	565	1696	372	1115		15.8	16.4	16.9	18.3	19.4	22.4	25.4	28.4	31.4	34.4	37.4
2513	44W15SF	15.0	490	1470	322	966				15.3	16.6	17.8	20.8	23.8	26.8	29.8	32.8	35.8
	44W17SF	17.0	432	1297	284	852						16.1	19.2	22.2	25.2	28.2	31.2	34.2
	44W18SF	18.0	408	1225	268	805							18.3	21.3	24.3	27.3	30.3	33.4
	44W20SF	20.0	368	1103	242	725								19.6	22.6	25.3	28.7	31.7
	44W22SF	22.0	334	1002	220	659								17.9	20.9	23.9	26.9	30.0
	44W24SF	24.0	306	919	201	603									19.1	22.1	25.2	28.2

Collet Bushings



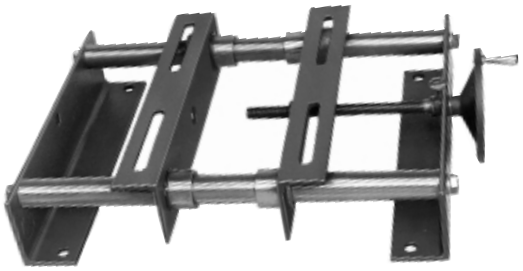
Collet Bushings

All dimensions are in inches

Collet No.	Standard Bore Sizes (Inches)	B	C	D	E
7707	.5, .625, .75, .875	2.5	1	3.25	.325 – 16
508	.625, .75, .875, 1, 1.125	3	1.25	3.75	.325 – 16
510	.75, .875, 1, 1.125, 1.25, 1.375	3.625	1.5	4.625	.5 – 13
512	1, 1.125, 1.25, 1.375, 1.5, 1.625	4	1.75	5	.5 – 13
7713	1.375, 1.5, 1.625, 1.875	4.875	2.125	6.125	.625 – 11

Motor Bases continued on next page

Hi-Lo Motor Bases for *Adjustable Center Distance Drives* have been designed to accommodate NEMA motor frame sizes 48 through 286T, with rigid steel construction, and lube free bushings in the motor mount plates for easy adjustment and greater wearability on the 214, 254 & 284 models.

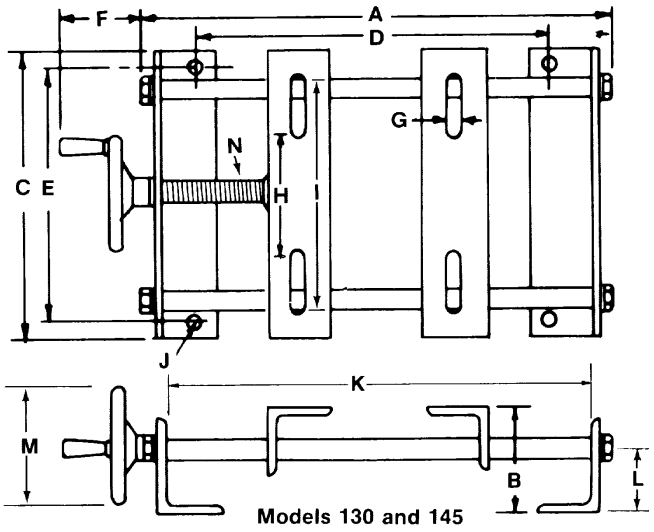


Motor Base Selection

NEMA Motor Frame No.	Motor H.P. at 1800 RPM	Hi-Lo Motor Base Number 130	145	213	254	284
48		•				
56	.25 thru .75	•	•			
182	1		•			
143T	1	•	•			
184	1.5 & 2		•	•		
145T	1.5 & 2		•			
213	3			•		
182T	3		•	•		
215	5			•	•	
184T	5			•	•	
254U	7.5				•	
213T	7.5				•	
256U	10					
215T	10				•	
284U	15					
254T	15				•	
256T	20					•
284T	25					•
286T	30					•

Models 130 and 145

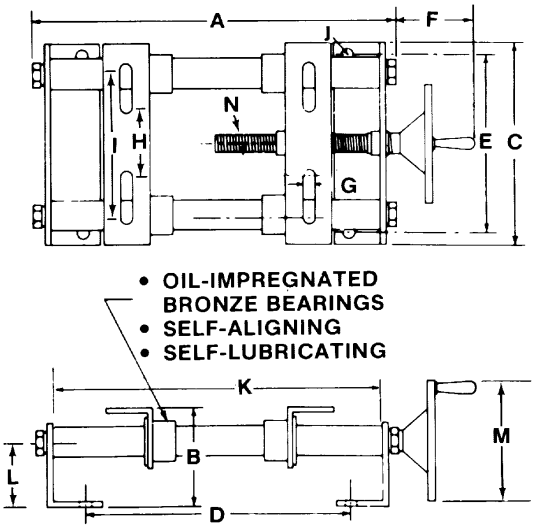
This motor base is designed of steel parts in place of castings to be compact, lighter in weight, greater in strength and rigidly, and lower in cost. Can be mounted in any position.



Models 130 and 145

Models 213, 254, and 284

Models #213 and #254 are designed with oversize slide rod rails and oil-impregnated bronze bearings for large bearing area and lubricated sliding surfaces. The bearings are self-aligning for ease of operation.



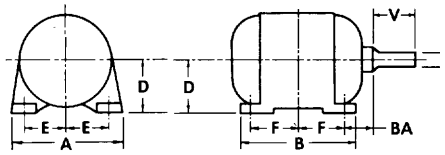
Models 213. 254 and 284

Dimensions

MOTOR BASE No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N
130	11	2 7/8	6	7 1/4	5	2 3/4	13/32	2 1/8	4 7/8	7/16	10	2	3	5/8-11
145	16 1/8	3 7/8	9 1/2	12 1/4	8 1/2	2 5/8	13/32	2 7/8	7 7/16	33/64	15	2 1/2	4	5/8-11
213	16 1/4	3 13/16	9 1/2	12 1/4	8 1/2	2 13/16	13/32	2 7/8	7 7/16	33/64	15	2 7/16	4	5/8-11
254	19 5/16	4 3/16	11	15 1/4	10	2 13/16	17/32	5 1/2	8 3/4	33/64	18	2 13/16	5	5/8-11
284	21 7/16	4 7/8	15	16 7/8	13 3/8	2 13/16	11/16	8	13	11/16	20	3 1/8	5	3/4-16

NEMA Foot-Mounted Motor

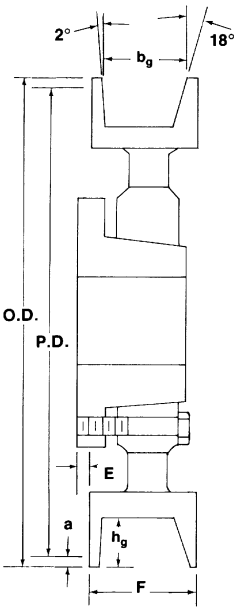
All dimensions are in inches



Frame No.	A Max.	B Min.	Dimensions D	E	F	BA	U	V Min.	Key Width	Thick-ness	Length
48			3	2 1/8	1 3/8	2 1/2	1/2				
56			3 1/2	2 7/16	1 1/8	2 3/4	5/8				
143T	7	4 13/16	3 1/2	2 3/4	2	2 1/4	7/8	2 1/4	3/16	3/16	1 3/8
145T	7	5 13/16	3 1/2	2 3/4	2 1/2	2 1/4	7/8	2 1/4	3/16	3/16	1 3/8
182	9	6 1/2	4 1/2	3 3/4	2 1/4	2 3/4	7/8	2	3/16	3/16	1 3/8
182T	9	6	4 1/2	3 3/4	2 1/4	2 3/4	1 1/8	2 3/4	1/4	1/4	1 3/4
184	9	7 1/2	4 1/2	3 3/4	2 3/4	2 3/4	7/8	2	3/16	3/16	1 3/8
184T	9	6 3/8	4 1/2	3 3/4	2 3/4	2 3/4	1 1/8	2 3/4	1/4	1/4	1 3/4
213	10 1/2	7 1/2	5 1/4	4 1/4	2 3/4	3 1/2	1 1/8	2 3/4	1/4	1/4	2
213T	10 1/4	7	5 1/4	4 1/4	2 3/4	3 1/2	1 3/8	3 3/8	5/16	5/16	2 3/8
215	10 1/2	9	5 1/4	4 1/4	3 1/2	3 1/2	1 1/8	2 3/4	1/4	1/4	2
215T	10 1/4	8 1/2	5 1/4	4 1/4	3 1/2	3 1/2	1 3/8	3 3/8	5/16	5/16	2 3/8
254U	12 1/2	10 3/4	6 1/4	5	4 1/8	4 1/4	1 3/8	3 1/2	5/16	5/16	2 3/4
254T	12 1/4	9 3/4	6 1/4	5	4 1/8	4 1/4	1 5/8	4	3/8	3/8	2 7/8
256U	12 1/2	12 1/2	6 1/4	5	5	4 1/4	1 3/8	3 1/2	5/16	5/16	2 3/4
256T	12 1/4	11 1/2	6 1/4	5	5	4 1/4	1 5/8	4	3/8	3/8	2 7/8
284U	14	12 1/2	7	5 1/2	4 3/4	4 3/4	1 5/8	4 5/8	3/8	3/8	3 3/4
284T	13 1/2	11 1/4	7	5 1/2	4 3/4	4 3/4	1 7/8	4 5/8	1/2	1/2	3 1/4
286U	14	14	7	5 1/2	5 1/2	4 3/4	1 5/8	4 5/8	3/8	3/8	3 3/4
286T	13 1/2	12 3/4	7	5 1/2	5 1/2	4 3/4	1 7/8	4 5/8	1/2	1/2	3 1/4

Asymmetric Sheaves & Belts

Cross Section	F	b_g +.010	h_g Min.	E +.062	2a
23A	1.69	1.417	.625	.41	.40
26A	1.94	1.653	.875	.25	.47
33A	2.325	2.047	1.000	0	.59



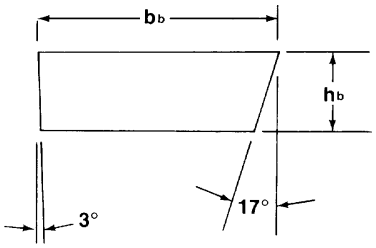
Asymmetric Sheaves

All dimensions are in inches

DISCONTINUED

Sheav No.								D.	Bush.
23A80	8.35	7.95	SK	26A87	9.17	8.7	SF	9.7	SF
23A94	9.75	9.35	SK	26A97	10.17	9.7	SF	10.7	SF
23A110	11.35	10.95	SK	26A107	11.17	10.7	SF	11.7	SF
23A124	12.75	12.35	SK	26A117	12.17	11.7	SF	13.7	SF
23A136	13.95	13.55	SK	26A137	14.17	13.7	SF	15.7	SF
23A154	15.75	15.35	SK	26A157	16.17	15.7	SF	17.7	SF
				26A177	18.17	17.7	SF		

								33A97	10.29		
								33A107	11.29	10.7	SF
								33A117	12.29	11.7	SF
								33A137	14.29	13.7	SF
								33A157	16.29	15.7	SF
								33A177	18.29	17.7	SF



Cross Section Dimensions

Section	b_b MM	b_b IN.	h_b MM	h_b IN.
23A	36	1.417	12	.472
26A	42	1.654	14	.551
33A	52	2.047	17	.630
36A	57	2.244	20	.787

Asymmetric Belts

Belt No.	Pitch Length MM	Pitch Length In.
23A1060	1060	41.7
23A1100	1100	43.3
23A1180	1180	46.5
23A1250	1250	49.2
23A1400	1400	55.1
23A1500	1500	59.1
23A1600	1600	63.0
23A1700	1700	66.9
23A1800	1800	70.9
23A2000	2000	78.7

Belt No.	Pitch Length MM	Pitch Length In.
26A1250	1250	49.2
26A1300	1300	51.2
26A1400	1400	55.1
26A1500	1500	59.1
26A1600	1600	63.0
26A1750	1750	68.9
26A1800	1800	70.9
26A1900	1900	74.8
26A2000	2000	78.7
26A2120	2120	83.5
26A2400	2400	94.5
26A2500	2500	98.4
26A2650	2650	104.3

Belt No.	Pitch Length MM	Pitch Length In.
33A1500	1500	59.1
33A1600	1600	63.0
33A1700	1700	66.9
33A1750	1750	68.9
33A1800	1800	70.9
33A1900	1900	74.8
33A2000	2000	78.7
33A2120	2120	83.5
33A2300	2300	90.6
33A2400	2400	94.5
33A2500	2500	98.4
33A2650	2650	104.3
33A2800	2800	110.2

Belt No.	Pitch Length MM	Pitch Length In.
36A1800	1800	70.9
36A1900	1900	77.8
36A2000	2000	78.7
36A2120	2120	83.5
36A2250	2250	88.6
36A2400	2400	94.5
36A2500	2500	98.4
36A2600	2600	102.4
36A2700	2700	106.3
36A2800	2800	110.2
36A3000	3000	118.1

Horsepower Ratings and Selection Guide Fixed Center Distance Drives

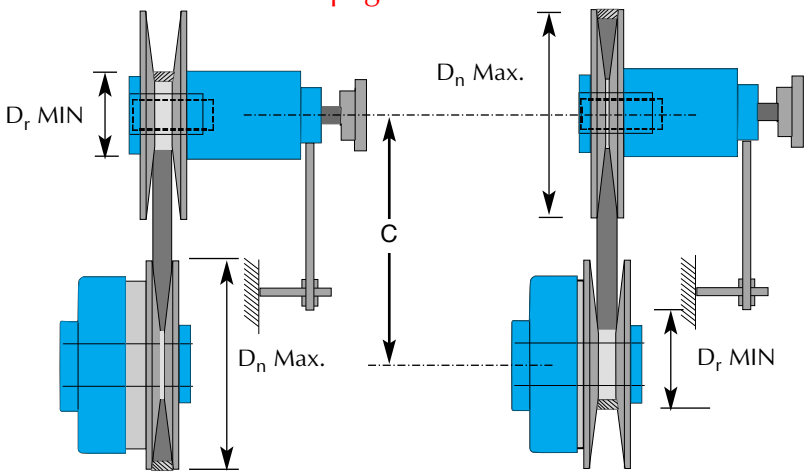
Fixed Center Distance Drives are horsepower rated at the driven shaft when the drive is at a 1:1 ratio or when the driven shaft is at the same RPM as the driver.

The HORSEPOWER output of the driven shaft will be constant as the driven RPM increases from driver RPM to maximum RPM and will decrease in direct proportion to decreases in driven RPM from driver RPM.

The TORQUE output of the driven shaft decreases in inverse proportion to driven shaft RPM increases from driver RPM and remains constant as the driven RPM decreases.

Example:
A MCW90 driver and 106TBR driven drive is rated at 5.00 H.P. at 1750 RPM. The maximum and minimum pitch diameters of the driver pulley are 8.75″ and 2.25″, respectively. The maximum and minimum pitch diameters of the driven pulley are 10.38″ and 4.44″ respectively. The 1:1 ratio pitch diameter is 6.67″.

continued on next page



Driven RPM = $\frac{D_r}{D_n}$ x Driver RPM	HP Output at Driven Shaft Formula 1	Torque Output at Driven Shaft Formula 2
Mean = $\frac{6.67}{6.67}$ x 1750 = 1750	5.00	$\frac{5.00 \times 63{,}025}{1750}$ = 180
Max. = $\frac{8.75}{4.44}$ x 1750 = 3448	$\frac{94 \times 3348}{63{,}025}$ = 5.0	$\frac{5.00 \times 63{,}025}{3348}$ = 94
Min. = $\frac{2.25}{10.38}$ x 1750 = 380	$\frac{180 \times 380}{63{,}025}$ = 1.1	$\frac{1.10 \times 63{,}025}{380}$ = 180

D_r = Driver Pulley Pitch Diameter (P.D.)
D_n = Driven Pulley Pitch Diameter (P.D.)
D_m = Mean or 1-1 Pitch Diameter (P.D.)
C = Center Distance Between Shafts
C_2 = Min. RPM Center Distance
N_1 = Driver Shaft RPM
N_2 = Driven Shaft RPM

Hi-Lo Pulleys are not recommended for drives that are reversed without coming to a full stop.

Drive Selection Example

A drive system requires driven shaft speeds of 400 RPM min. and 2400 RPM max. The torque requirement has been determined at 115 in.-lbs. throughout the speed range. The service is normal duty operating up to 16 hours per day. The specified driver is a 1750 RPM electric motor.

Step 1. Determine the Horsepower Requirement

The maximum HP requirement is determined at the maximum driven RPM.

$$HP = \frac{\text{Torque} \times N_2(\text{max.})}{63{,}025} = \frac{115 \times 2400}{63{,}025} = 4.38$$

Step 2. Apply the Drive Service Factor

Require HP Capacity = Service Factor x Drive HP
= 1.1 x 4.38 = 4.8

Step 3. Select Hi-Lo Pulley System

From the drive system's HP and speed range requirements a MCW90/106TBR drive can be used.

MCW90/106TBR Specifications:
Horsepower 5.0 at 1750 RPM, Speed Range 380-3420 RPM

In this case, the maximum RPM speed stop should be set at approximately 2400 RPM. To increase the drive system's speed to the available 3420 RPM would increase the HP requirement to where a 5 HP motor could be burned out.

$$HP = \frac{115 \times 3420}{63{,}025} = 6.24$$

Step 4. Determine the Recommended Center Distance

$$C = \frac{D_n(\text{max.}) + 3D_r(\text{max.})}{2} = \frac{10 + 3(8.75)}{2} = 18$$

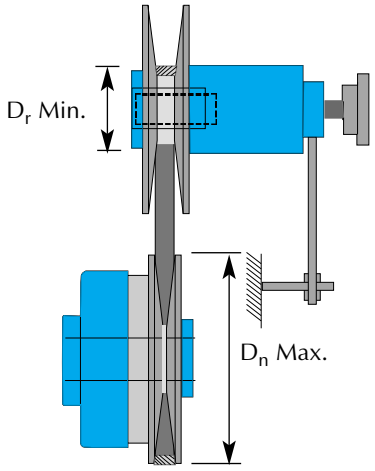
Step 5. Determine the Belt Size

From the pre-engineered belt and center distance selection tables (page 29), note that the closest center distance to the recommended one is 16.6 inches and the belt size listed above is 2322V541.

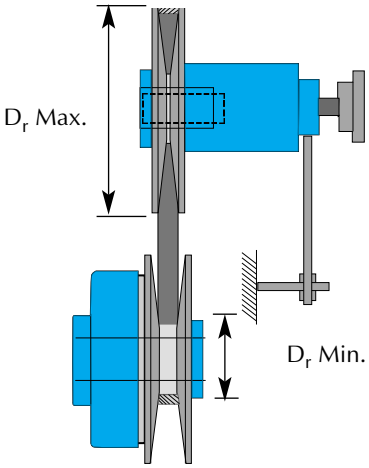
To find the belt length with a known center distance
$B.L. = 2C + 3.14D_m$
To find the center distance with a known belt length
$$C = \frac{B.L. - 3.14D_m}{2}$$

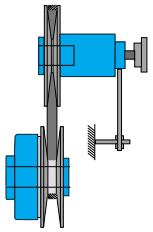
The correct center distance for an available belt length is necessary to obtain the full speed ratio of a Fixed Center Drive. Therefore, some center distance adjustment is required to adjust for belt length tolerances.

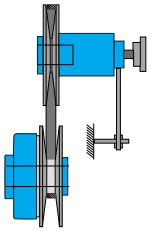
Min. RPM Position



Max. RPM Position







Drive Selection Worksheet

In order to select a Fixed Center Distance Drive you need to know and determine the following:

1. The horsepower or running torque requirement of the equipment. Hi-Lo Pulleys are rated in the catalog in conjunction with the rating of 1750 RPM and 1150 RPM electric motors.
2. The Service Factor of the drive. See charts below and on page 6 to determine other conditions that may affect drive selection.
3. The diameters of the driver shaft and driven shaft.
4. The RPM of the driver shaft.
5. The desired RPM range of the driven shaft.
6. The available center distance between the driver and driven shaft.
7. Determine the model Hi-Lo Pulley drive to be used, considering Horsepower and Speed Range requirement at the driven shaft.
8. Determine the belt to be used considering the Hi-Lo Pulley Drive selected and available center distance.

The Hi-Lo Catalog contains pre-engineered Belt Length and Center Distance selection tables for Hi-Lo Pulley Fixed Center Drives.

Service Factors for Hi-Lo Pulleys

	Operating Hours Per Day		
Service Environment	**0–8**	**8–16**	**16–24**
NORMAL DUTY: Where infrequent starting and peak loads do not exceed 160% of normal running load	1.00	1.10	1.30
MODERATE DUTY: Where occasional starting and peak loads do not exceed 250% of normal running loads	1.20	1.30	1.35
HEAVY DUTY: Where occasional starting and peak loads are in excess of 250% of normal running loads OR where starting loads, peak loads and overloads occur frequently	1.25	1.35	1.50

The service factors are important in selecting a variable speed pulley that will provide adequate service life.
Multiply the maximum running torque or horsepower of the drive by the appropriate service factor to determine the proper capacity Hi-Lo Pulley.

Fixed Center Distance Drives

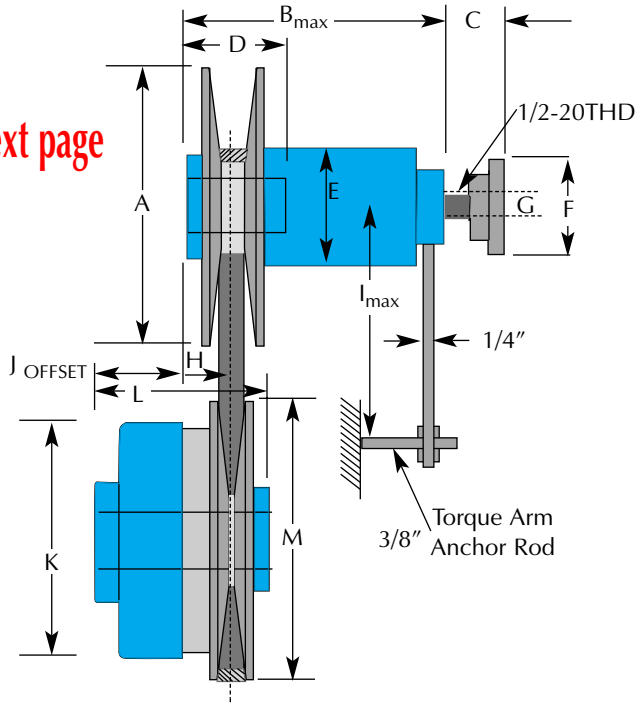
HP Ratings Driven RPM 1750 to Max.	at Min.	Drive Ratio	RPM Range 1750 Motor	Driver Model #	Driven Model #	Face Diameter	Length	Belt Size	Standard Bore Sizes
V-BELT DRIVES									
				MCV 30		**3.38**			**.5•.625•.75**
.75	.38	4:1	875/3500		**30TBR**	3.38	6.18	A	.5•.625•.75
1.0	.39	3.1:1	687/2106		**40 TBR**	4.25	6.18	A	.5•.625•.75
				MCV 500		**5.00**			**.625•.75•.875**
1.5	.55	7.1:1	647/4625		**50 TBR**	5.00	7.50	B	.625•.75•.875
2.0	.64	5: 1	557/3014		**57-20 TBR**	5.75	7.50	B	.5•.625•.75•.875
2.0	.64	5.4:1	557/3014		**57 TBR**	5.75	9.01	B	.75•.875•1•1.125
2.0	.55	4.6:1	485/2248		**66 TBR**	6.63	8.00	B	.75•.875•1•1.125
2.0	.52	3.8:1	367/1408		**86 TBR**	8.63	8.00	B	.75•.875•1•1.125
				MCV 57		**5.75**			**.75•.875•1•1.125**
3.0	1.10	6.9:	1648/4500		**57 TBR**	5.75	9.01	B	.75•.875•1•1.125
3.0	.97	5.7:1	564/3214		**66 TBR**	6.63	9.01	B	.75•.875•1•1.125
5.0	1.22	4.0:1	427/1750		**86 TBR**	8.63	9.01	B	.75•.875•1•1.125
				MCW 600		**6.13**			**.625•.75•.875**
1.0	.31	10:1	550/5500		**60 TBR**	6.13	8.46	1422V	.625•.75•.875
1.5	.34	7.5:1	400/3000		**75 TBR**	7.50	8.46	1422V	.75•.875•1•1.125
				MCW 70		**7.13**			**.625•.75•.875•1**
2.0	.48	9.6:1	423/4075		**80 TBR**	8.00	9.88	1922V	.75•.875•1•1.125
3.0	.65	7.7:1	375/2863		**90-19 TBR**	9.00	10.57	1922V	510 Collet
3.0	.60	5.8:1	305/1776		**110TBR**	11.00	10.57	1922V	
				MCW 77		**7.75**			**.875•1•1.125**
3.0	.77	7.7:1	450/3470		**90-19 TBR**	9.00	11.34	1922V	510 Collet
5.0	1.00	5.8:1	365/2108		**110 TBR**	11.00	11.34	1922V	510 Collet
				MCW 90		**9.00**			**.875•1•1.125**
3.0	.77	10:1	450/4500		**90-23 TBR**	9.00	11.69	2322V	510 Collet
5.0	1.00	9:1	380/3420		**106 TBR**	10.60	11.69	2322V	510 Collet
5.0	.96	7.4:1	336/2490		**120 TBR**	12.00	11.69	2322V	510 Collet
				MCW 90-75		**9.00**			**1.125•1.25•1.375**
7.5	1.70	6:1	395/2397		**120 TBR**	12.00	11.74	2322V	510 Collet
ASYMMETRIC BELT DRIVES									
				MA 82		8.27			**1•1.125•1.375**
5.0	1.50	6:1	500/3000		**A 96**	9.63	9.00	23A	Collet No. 512
				MA 96		9.63			**1•1.125•1.375•1.625**
10.0	3.20	5.4:1	560/3000		**A 112**	11.20	12.30	26A	Collet No. 512
				MA 112		11.20			**1.375•1.625**
15.0	4.30	6:1	500/3000		**A 130**	13.0	12.70	26A	Collet No. 7713
				MA 112-33		11.20			**1.625•1.875**
30.0	9.80	5:1	600/3000		**A130-33**	13.00	13.30	33A	Collet No. 7713
				MA 136		13.60			**1.625•1.875•2.125**
40.0	11.40	5:1	600/3000		**A 164**	16.40	13.50	36A	SK Bushing
				MA 164		16.40			SK Bushing
50.0	21.00	4.5:1	717/3580		**A164**	16.40	14.70	36A	SK Bushing
60.0	30.00	4.6:1	700/3220		**A 177**	17.70	16.45	36A	SF Bushing
				MA 177		17.70			SF Bushing
75.0	55.00	3:1	1010/3000		**A 177**	17.70	18.13	36A	SF Bushing
100	40.00	4:1	595/2380		**A 221**	22.10	18.13	36A	SF Bushing
				MA 221		22.10			SF Bushing
125	75.80	2.5:1	838/2055		**A 221**	22.10	23.13	36A	SF Bushing

MCV Series .75–5 hp

Fixed Center Distance Drives

continued on next page

MCV series pulleys are Fixed Center Distance Drive type pulleys. The MCW pulleys use Standard V-Belts and have horsepower rating from .75–5 HP. The automatic pulleys have Hi-Lo's torque-sensing mechanism to control belt tension with load requirement.



Dimensions • MCV Series

All dimensions are in inches

Pulley Combination Driver	Driven	A	B	C	D	E	F	G	H	I	J	K	L	M	Stock Bore Sizes
MCV30		3.38	4.50	.75	1.63	2.19	2.30	.44	.99	2.25					.5•.625•.75
	30TBR										.93	3.06	2.69	3.38	.5•.625•.75
	40TBR										.93	3.06	2.69	4.25	.5•.625•.75
MCV500		5.00	5.40	1.07	2.05	2.19	2.30	.44	1.01	4.25					.625•.75•.875
	50TBR										1.27	4.07	3.07	5.0	.625•.75•.875
	57-20TBR										1.27	4.07	3.07	5.75	.625•.75•.875
	57TBR										1.77	5.08	3.88	5.75	.75•.875•1•1.125
	66TBR										1.77	5.08	3.88	6.63	.75•.875•1•1.125
	86TBR										1.77	5.08	3.88	8.63	.75•.875•1•1.125
MCV57		5.75	6.50	1.13	3.13	2.88	2.30	.44	1.01	5.75					.75•.875•1•1.125
	57TBR										1.38	5.08	3.88	5.75	.75•.875•1•1.125
	66TBR										1.38	5.08	3.88	6.63	.75•.875•1•1.125
	86TBR										1.38	5.08	3.88	8.63	.75•.875•1•1.125

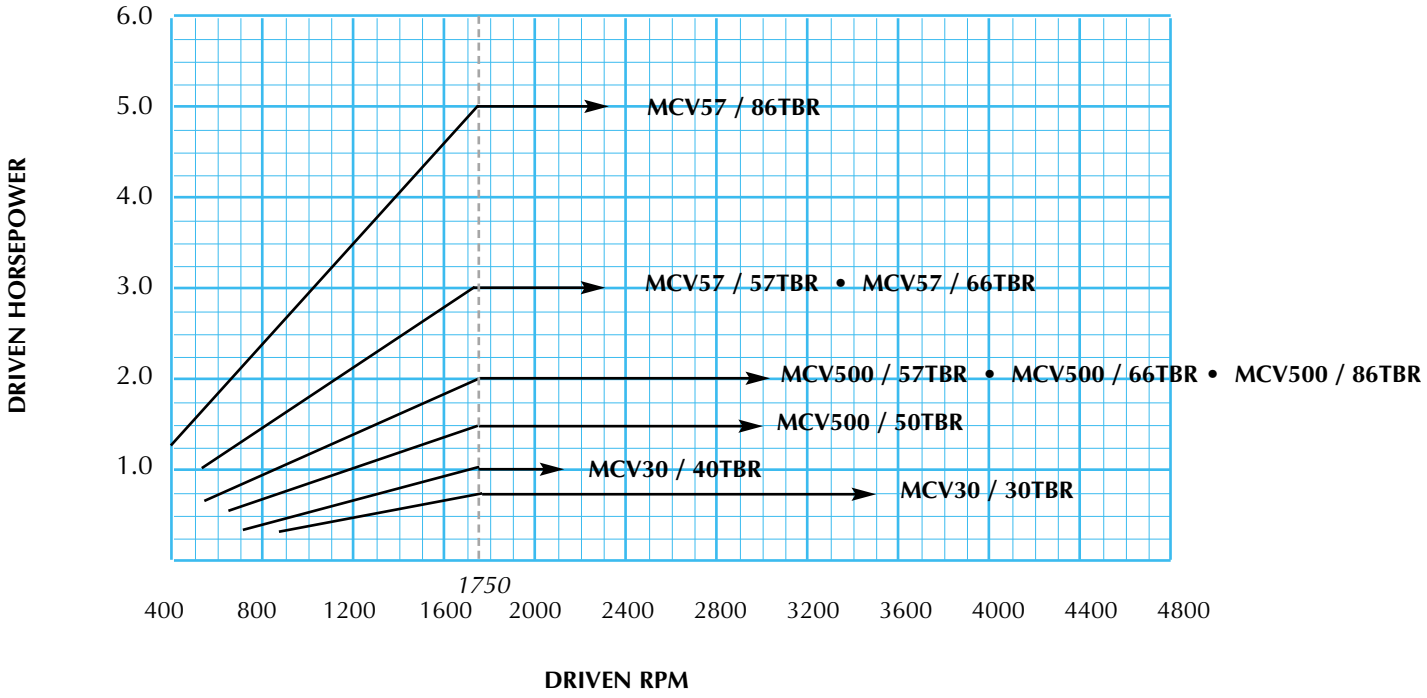
*Model MCV500 replaces MCV50

Specifications • MCV Series

All dimensions are in inches

HP Ratings 1750 RPM Driven RPM 1750 to Max.	at Min.	1150 RPM Driven RPM 1150 to Max.	at Min.	Driven RPM 1750 RPM Min.	Max.	1150 RPM Min.	Max.	Ratio	Pulley Combination Driver	Driven	Belt Size	Pitch Diameter Driver Min.	Max.	Driven Min.	Max.	1-1 Ratio
.75	.38	.50	.25	875	3500	578	2310	4.0:1	**MCV30**	**30TBR**	A	1.57	3.14	1.57	3.14	2.36
1.00	.39	.75	.25	687	2106	454	1390	3.1:1	**MCV30**	**40TBR**	A	1.57	3.14	2.60	4.00	2.87
1.50	.55	1.00	.36	647	4625	427	3053	7.1:1	**MCV500**	**50TBR**	B	1.72	4.65	1.76	4.65	3.25
2.00	.64	1.50	.42	557	3014	368	1990	5.4:1	**MCV500**	**57-20TBR**	B	1.72	4.65	2.70	5.40	3.70
2.00	.64	1.50	.42	557	3014	368	1990	5.4:1	**MCV500**	**57TBR**	B	1.72	4.65	2.70	5.40	3.70
2.00	.55	1.50	.36	485	2248	320	1484	4.6:1	**MCV500**	**66TBR**	B	1.72	4.65	3.62	6.20	4.14
2.00	.52	1.50	.34	367	1408	243	929	3.8:1	**MCV500**	**86TBR**	B	1.72	4.65	5.78	8.20	
3.00	1.10	2.00	.72	648	4500	428	2970	6.9:1	**MCV57**	**57TBR**	B	2.00	5.40	2.10	5.40	3.82
3.00	.97	2.00	.64	564	3214	373	2121	5.7:1	**MCV57**	**66TBR**	B	2.00	5.40	2.94	6.20	4.20
5.00	1.22	3.00	.80	427	1750	282	1155	4.1:1	**MCV57**	**86TBR**	B	2.00	5.40	5.30	8.20	5.35

Horsepower Curve • 1750 RPM Driver



Pre-Engineered Belt and Center Distance Selection Chart • MCV Series

MCV30 Series

All dimensions are in inches

Pulley Combination		A Section Belt Sizes												
Driver	**Driven**	**A21**	**A23**	**A26**	**A29**	**A31**	**A33**	**A35**	**A37**	**A39**	**A42**	**A46**	**A48**	**A51**
MCV30	**30TBR**	7.4	8.4	9.9	11.4	12.4	13.4	14.4	15.4	16.4	17.9	19.9	20.99	22.4
	40TBR	6.6	7.7	9.2	10.7	11.7	12.7	13.7	14.7	15.7	17.2	19.2	20.2	21.7

MCV500 Series

Pulley Combination		B Section Belt Sizes												
Driver	**Driven**	**B28**	**B32**	**B35**	**B38**	**B40**	**B42**	**B44**	**B46**	**B48**	**B50**	**B53**	**B56**	**B59**
	50TBR	9.8	11.8	13.3	14.8	15.8	16.8	17.8	18.8	19.8	20.8	22.3	23.8	25.3
	57TBR	9.1	11.1	12.6	14.1	15.1	16.2	17.2	18.2	19.2	20.2	21.7	23.2	24.7
MCV500	**66TBR**	8.3	10.4	11.9	13.4	14.4	15.5	16.5	17.5	18.5	19.5	21.0	22.5	24.0
	86TBR			10.0	11.6	12.6	13.6	14.7	15.7	16.7	17.7	19.2	20.7	22.7

MCV57 Series

Pulley Combination		C Section Belt Sizes												
Driver	**Driven**	**B28**	**B32**	**B35**	**B38**	**B40**	**B42**	**B44**	**B46**	**B48**	**B50**	**B53**	**B56**	**B59**
	57TBR	8.9	10.9	12.4	13.9	15.0	16.0	17.0	18.0	19.0	20.0	21.5	23.0	24.5
MCV57	**66TBR**	8.2	10.2	11.7	13.2	14.3	15.3	16.3	17.3	18.3	19.3	20.8	22.3	23.8
	86TBR			9.9	11.4	12.4	13.5	14.5	15.5	16.5	17.5	19.0	20.6	22.1

To determine unlisted Belt Lengths and Center Distances, use these formulas:

$$L=2C+3.14D$$

$$C=\frac{(L-3.14D)}{2}$$

C=Center Distance
D=1.1 Pitch Diameter
L=Belt Pitch Length

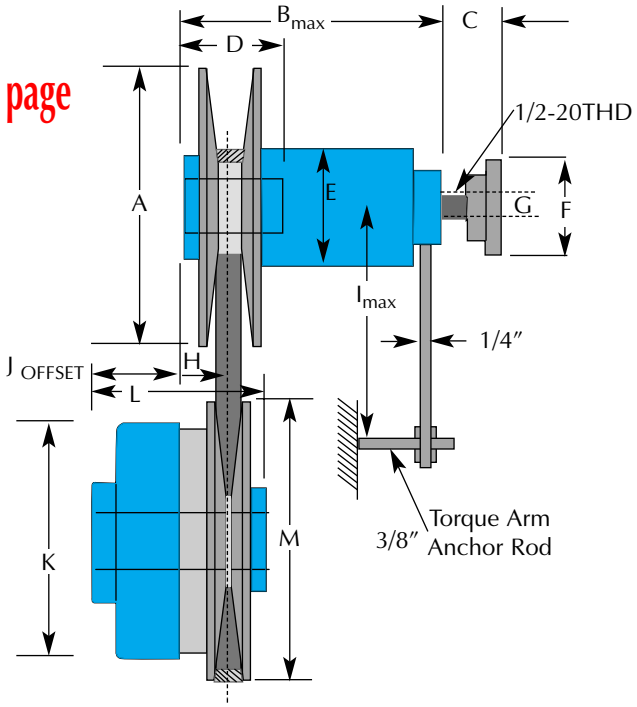
MCW Series 1–7.5 hp

Fixed Center Distance Drives

continued on next page

Standard V-Belt and Variable Speed Belt Pulley Drives

MCW series pulleys are Fixed Center Distance Drive type pulleys. The MCW pulleys use Variable Speed Belts and have horsepower rating from 1–7.5 HP. The automatic pulleys have Hi-Lo's torque-sensing mechanism to control belt tension with load requirement.



Dimensions • MCW Series

All dimensions are in inches

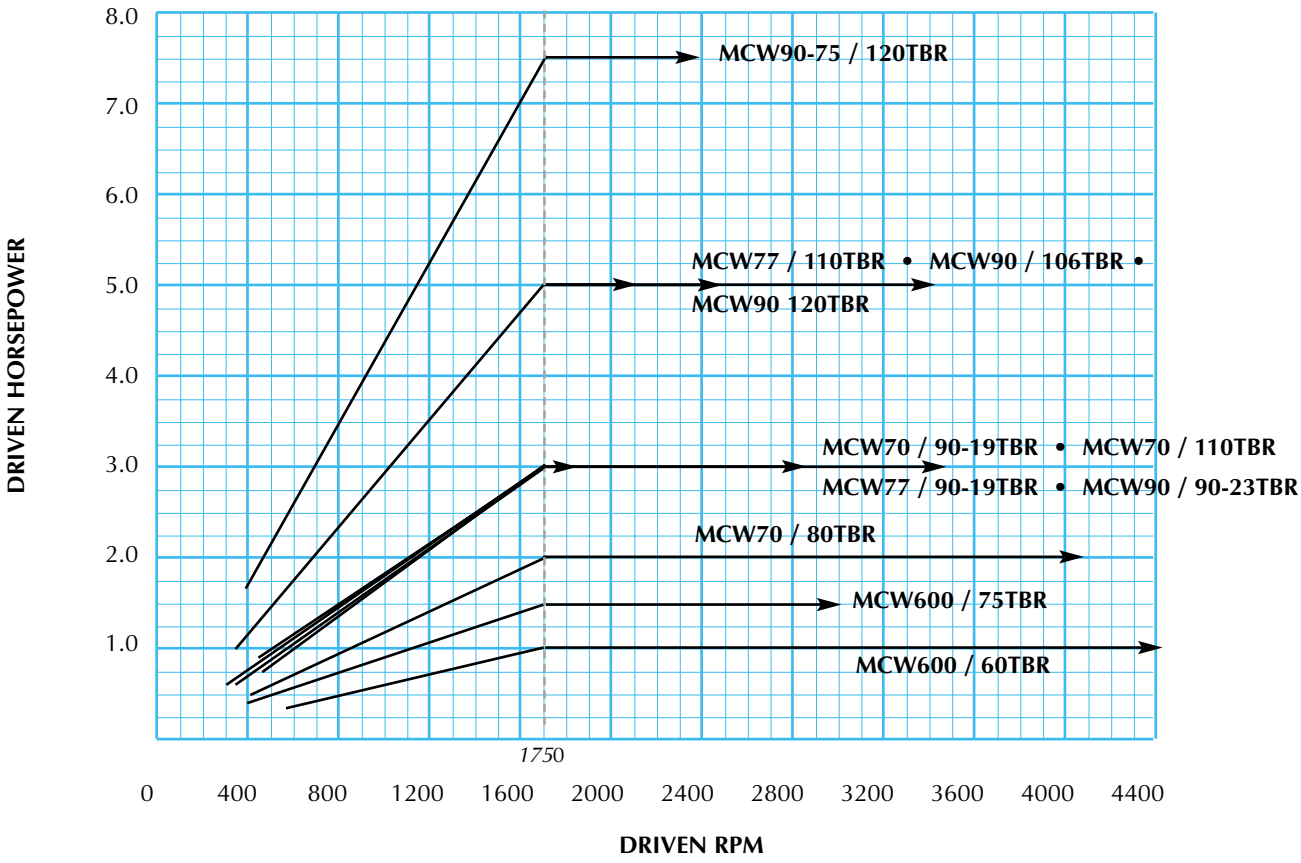
Pulley Combination Driver	Driven	A	B	C	D	E	F	G	H	I	J	K	L	M	Stock Bore/Collet Sizes	Hand wheel Turns
MCW600		**6.13**	**6.20**	**.75**	**2.70**	**2.20**	**2.00**	**.437**	**1.41**	**4.25**					**.625•.75•.875**	**16.0**
	60TBR										1.51	5.08	3.94	6.13	.625•.75•.875	
	75TBR										1.51	5.08	3.88	7.50	.75•.875•1•1.125	
MCW70		**7.13**	**6.63**	**1.25**	**3.12**	**2.63**	**4.50**	**.437**	**1.53**	**5.75**					**.625•.75•.875•1**	**18.0**
	80TBR										2.00	5.27	4.81	8.00	.75•.875•1•1.125	
	90-19TBR										2.69	7.13	5.50	9.00	*Collet #510	
	110TBR										2.69	7.13	5.50	11.00	*Collet #510	
MCW77		**7.75**	**7.65**	**1.25**	**3.50**	**2.88**	**4.50**	**.437**	**1.78**	**5.75**					**.875•1•1.125**	**21.3**
	90-19TBR										2.44	7.13	5.50	9.00	*Collet #510	
	110TBR										2.44	7.13	5.50	11.00	*Collet #510	
MCW90		**9.00**	**7.88**	**1.25**	**3.50**	**2.88**	**4.50**	**.437**	**1.97**	**5.75**					**.875•1•1.125**	**25.0**
MCW90-75		**9.00**	**7.99**	**1.25**	**3.50**	**2.88**	**4.50**	**.437**	**1.97**	**5.75**					**.875•1•1.125•1.25•1.375**	**25.0**
	90-23TBR										2.56	7.13	6.00	9.00	*Collet #510	
	106TBR										2.56	7.13	6.00	10.60	*Collet #510	
	120TBR										2.56	7.13	6.00	12.00	*Collet #510	

Specifications • MCW Series

**Standard bore sizes for Collet #510: 1, 1.125, 1.25, 1.375*

HP Ratings 1750 RPM Motor Driven RPM 1750 to Max.	HP Ratings 1750 RPM Motor Driven RPM at Min.	HP Ratings 1150 RPM Motor Driven RPM 1150 to Max.	HP Ratings 1150 RPM Motor Driven RPM at Min.	Torque @1-1 Ratio	Driven RPM 1750 RPM Motor Min.	Driven RPM 1750 RPM Motor Max.	Driven RPM 1150 RPM Motor Min.	Driven RPM 1150 RPM Motor Max.	Ratio	Pulley Combination Driver	Pulley Combination Driven	Belt Size	Pitch Diameter Driver Min.	Pitch Diameter Driver Max.	Pitch Diameter Driven Min.	Pitch Diameter Driven Max.	1-1 Ratio
1.00	.31	.075	.20	36	550	5500	356	3560	10:1	**MCW600**	**60TBR**	1422V	1.70	5.92	1.70	5.92	3.90
1.50	.34	1.00	.22	54	400	3000	264	1980	7.5:1	**MCW600**	**75TBR**	1422V	1.70	5.92	3.44	7.30	4.71
2.00	.48	1.33	.32	72	423	4075	278	2678	9.6:1	**MCW70**	**80TBR**	1922V	1.88	6.90	2.96	7.78	5.02
3.00	.65	2.00	.42	108	375	2863	246	1882	7.7:1	**MCW70**	**90-19TBR**	1922V	1.88	6.90	4.22	8.78	5.60
3.00	.60	2.00	.35	108	305	1776	201	1167	5.8:1	**MCW70**	**110TBR**	1922V	1.88	6.90	6.80	10.78	6.80
3.00	.77	2.00	.52	108	450	3470	297	2290	7.7:1	**MCW77**	**90-19TBR**	1922V	2.25	7.53	3.80	8.78	5.74
5.00	1.00	3.00	.63	180	365	2108	241	1391	5.8:1	**MCW77**	**110TBR**	1922V	2.25	7.53	6.25	10.78	6.90
3.00	.77	2.00	.52	108	450	4500	297	2970	10:1	**MCW90**	**90-23TBR**	2322V	2.25	8.75	2.88	8.75	5.72
5.00	1.08	3.00	.65	180	380	3420	251	2257	9:1	**MCW90**	**106TBR**	2322V	2.25	8.75	4.44	10.38	6.67
5.00	.96	3.00	.58	180	336	2490	222	1642	7.4:1	**MCW90**	**120TBR**	2322V	2.25	8.75	6.15	11.75	7.48
7.50	1.70	5.00	1.13	270	395	2397	260	1555	6:1	**MCW90-75**	**120TBR**	2322V	2.65	8.75	6.47	11.75	7.64

Horsepower Curve • 1750 RPM Driver



Pre-Engineered Belt and Center Distance Selection Chart • MCW Series

All dimensions are in inches.

MCW600 Series

Pulley Combination		1422V Belt Size													
Driver	**Driven**	**300**	**330**	**340**	**360**	**400**	**420**	**440**	**460**	**470**	**480**	**540**	**600**	**660**	**720**
MCW600	**60TBR**	8.8	10.3	10.8	11.8	13.8	14.8	15.8	16.8	17.3	17.8	20.8	23.8	26.8	29.8
MCW600	**75TBR**	7.6	9.1	9.6	10.6	12.6	13.6	14.6	15.6	16.1	16.6	19.6	22.6	25.6	28.6

MCW77 and MCW70 Series

Pulley Combination		1922V Belt Size													
Driver	**Driven**	**381**	**403**	**426**	**443**	**454**	**484**	**526**	**544**	**604**	**630**	**646**	**666**	**726**	**756**
MCW70	**80TBR**	11.1	12.2	13.4	14.3	14.8	16.3	18.5	19.4	22.4	23.7	24.5	25.5	28.6	30.1
MCW70	**90-19TBR**	10.1	11.2	12.5	13.3	13.9	15.4	17.6	18.5	21.5	22.9	23.7	24.7	27.7	29.2
MCW70	**110TBR**			10.4	11.3	11.9	13.5	15.7	16.7	19.8	21.1	21.9	22.9	26.0	27.5
MCW77	**90-19TBR**	10.0	11.1	12.3	13.1	13.7	15.2	17.3	18.2	21.2	22.5	23.3	24.3	27.3	28.8
MCW77	**110TBR**			10.5	11.3	11.9	13.4	15.5	16.4	19.4	20.7	21.5	22.5	25.5	27.0

MCW90 and MCW90-75 Series

Pulley Combination		2322V Belt Size													
Driver	**Driven**	**441**	**481**	**521**	**541**	**601**	**621**	**661**	**681**	**701**	**721**	**801**	**826**	**846**	**886**
MCW90	**90-23TBR**	13.1	15.1	17.1	18.1	21.1	22.1	24.1	25.1	26.1	27.1	31.1	32.3	33.3	35.3
MCW90	**106TBR**	11.6	13.6	15.6	16.6	19.6	20.6	22.6	23.6	24.6	25.6	29.6	30.8	31.8	33.8
MCW90	**120TBR**		12.3	14.3	15.3	18.3	19.3	21.3	22.3	23.3	24.3	28.3	29.6	30.6	32.6
MCW90-75	**120TBR**		12.1	14.1	15.1	18.1	19.1	21.1	22.1	23.1	24.1	28.1	29.3	30.3	32.3

To determine unlisted Belt Lengths and Center Distances, use these formulas:

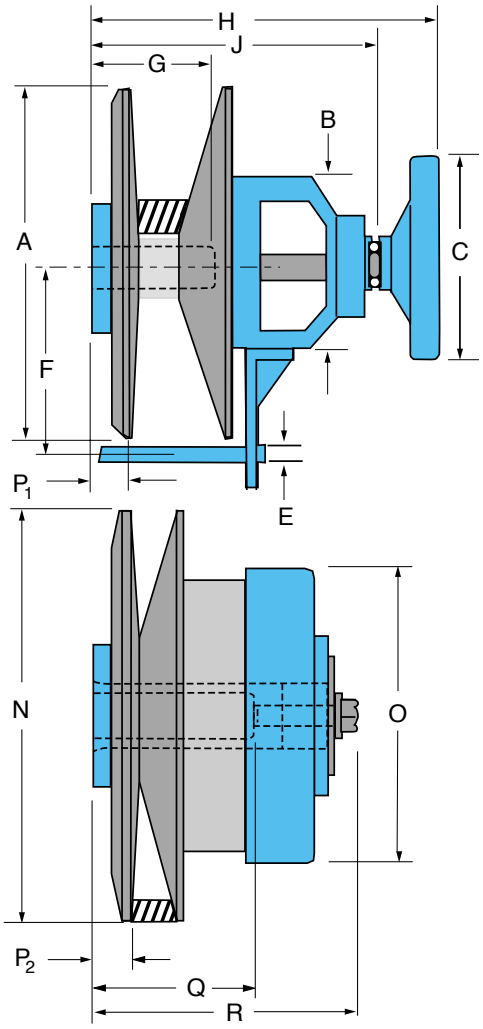
$$L = (2C + 3.14D) \qquad C = \frac{(L - 3.14D)}{2}$$

C = Center Distance
D = 1 to 1 Pitch Diameter
L = Belt Pitch Length

MA Series 5–30 hp

Asymmetric Fixed Center Distance Drives

continued on next page



Asymmetric Belt Pulley Drives

Instead of two identically angled V-shaped belt faces, Asymmetric Variable Speed pulleys pair a V-angled face with a nearly flat (2º) fixed face. The resulting design produces some important features

- **Stable Belt Center Line:**

As the fixed pulley face is nearly perpendicular, the belt center line movement throughout the entire pitch diameter range is negligible. Belt alignment with the driven sheave is maintained and crosswise wear on belts is reduced.

- **Compact and Simple**

Asymmetric drives require a minimum of space in a C-Flow configuration relative to their horsepower capacity. Installation alignment can be checked simply by laying a straight edge along the back of the fixed disks. The reduction of parts in the single sliding face design minimizes the possibility of a critical breakdown and simplifies repairs and replacement of parts.

- **Stable and Low Overhung Load On Bearings**

The C-Flow configuration of Asymmetric Drives and the nearly perpendicular angle of the fixed pulley face locates the point of bending moment close to mounting shaft bearings. The peripheral support of the cam and cam follower torque-sensing mechanism also reduces wear on the sliding face bearing surface. Use of interchangeable collet bushings eliminates side wobble and vibration due to bad fits between motor spindle and pulley shaft.

- **Automatic Belt Tensioning**

Incorporated in the automatic variable speed pulleys is Hi-Lo's exclusive belt-tensioning device. The cam and cam follower mechanism adjusts belt tension to the load requirement and stabilizes the pitch diameter setting regardless of load fluctuations.

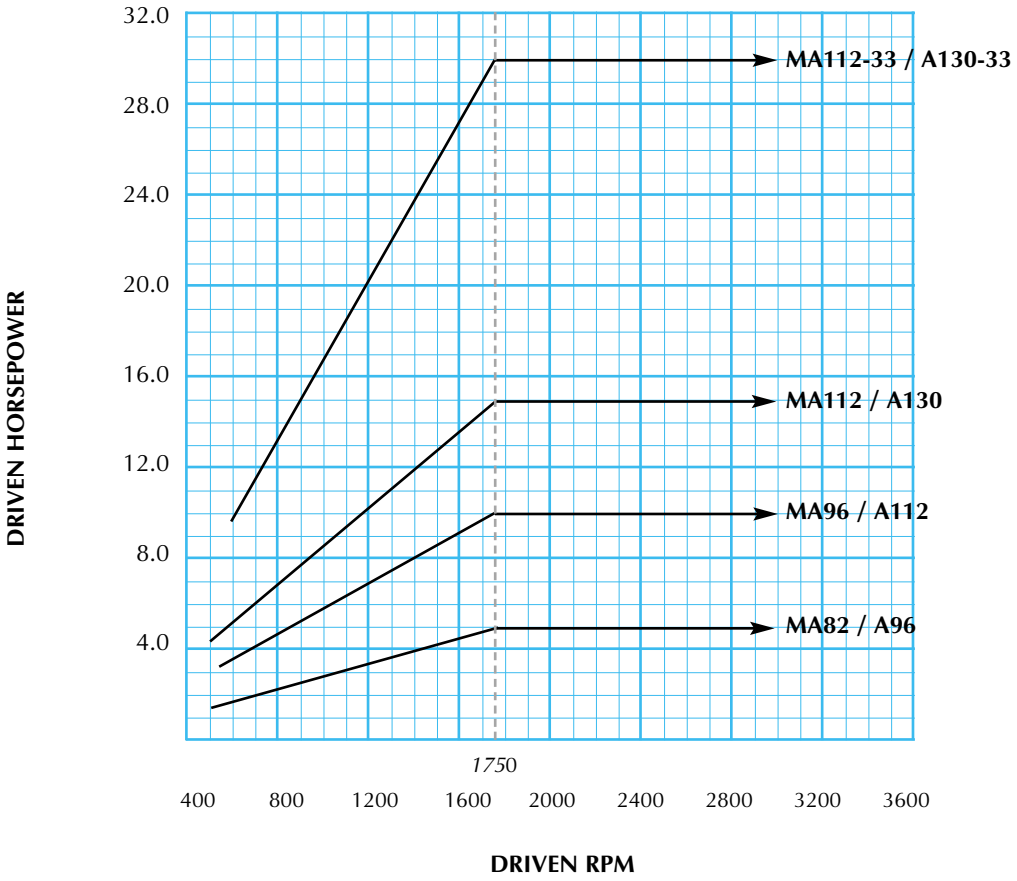
Dimensions • MA Series 5–30 HP

All dimensions are in inches

Pulley Combination Driver	Driven	A	B	C	D	E	F	G	H	J	P1	N	O	P2	Q	R	Stock Bores or Collet Sizes	Hand Wheel Turns
MA82	A96	8.27	3.94	4.0		.38	4.9	2.68	9.0	7.38	1.14	9.63	7.13	1.14	4.0	7.25	1•1.125•1.375 *Collet #512	17.8
MA96	A112	9.63	5.12	6.0		.47	7.0	4.88	12.3	10.12	1.14	11.2	7.13	1.48	4.0	7.94	1.125•1.375•1.625 *Collet #512	9.2
MA112	A130	11.2	5.12	6.0		.47	7.0	5.31	12.7	10.5	1.48	13.0	7.13	1.48	4.8	7.81	1.375•1.625 *Collet #7713	11.6
MA112-33	A130-33	11.2	6.30	6.0		.63	7.5	5.00	13.3	10.8	1.32	13.0	7.13	1.48	4.8	8.25	1.625•1.875 *Collet #7713	10.7

Standard Bore Sizes for Collet #510: .75, .875, 1, 1.125, 1.25, 1.375
#7713: 1.375, 1.5, 1.625, 1.875

Horsepower Curve • 1750 RPM Driver



Specifications • MA Series 5–30 HP

All dimensions are in inches

HP Ratings 1750 RPM Driven RPM 1750 to Max.	HP Ratings 1750 RPM Driven RPM at Min.	HP Ratings 1150 RPM Driven RPM 1150 to Max.	HP Ratings 1150 RPM Driven RPM at Min.	Torque @1-1 Ratio	Driven RPM 1750 RPM Min.	Driven RPM 1750 RPM Max.	Driven RPM 1150 RPM Min.	Driven RPM 1150 RPM Max.	Ratio	Pulley Combination Driver	Pulley Combination Driven	Belt Size	Pitch Diameter Driver Min.	Pitch Diameter Driver Max.	Pitch Diameter Driven Min.	Pitch Diameter Driven Max.	1-1 Ratio
5.00	1.50	3.00	1.00	180	500	3000	333	2000	6:1	**MA82**	**A96**	23A	2.76	7.88	4.32	9.24	6.15
10.00	3.20	7.50	2.20	360	560	3000	373	2000	5.4:1	**MA96**	**A112**	26A	3.45	9.24	5.32	10.70	7.32
15.00	4.30	10.00	2.90	540	500	3000	333	2000	6:1	**MA112**	**A130**	26A	3.55	10.7	5.82	12.40	8.35
30.00	9.80	20.00	6.50	1080	600	3000	400	2000	5:1	**MA112-33**	**A130-33**	33A	4.20	10.7	6.25	12.40	8.54

Pre-Engineered Belt and Center Distance Selection • MA Series 5–30 HP

To determine unlisted Belt Lengths and Center Distances, use these formulas:

L = (2C + 3.14D)

$C = \frac{(L - 3.14D)}{2}$

C = Center Distance
D = 1:1 Pitch Diameter
L = Belt Pitch Length

23A Belt Section Pitch Lengths

Pulley Combination Driver	Pulley Combination Driven	MM→ / Inches→	1060 / 41.7	1100 / 43.3	1180 / 46.5	1250 / 49.3	1400 / 55.2	1500 / 59.2	1600 / 63.0	1700 / 66.9	1800 / 71.9	2000 / 78.7
MA82	**A96**	C.D.	11.2	12.8	13.6	15.0	17.9	19.9	21.8	23.8	25.8	29.7

26A Belt Section Pitch Lengths

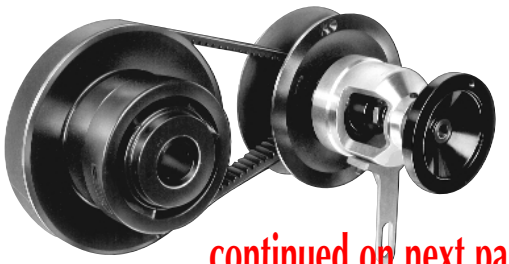
Pulley Combination Driver	Pulley Combination Driven	MM→ / Inches→	1250 / 49.3	1300 / 51.2	1400 / 55.2	1500 / 59.2	1600 / 63.0	1750 / 68.9	1800 / 70.9	1900 / 74.8	2000 / 78.7	2120 / 83.5	2400 / 94.5	2500 / 98.4	2650 / 104.3
MA96	**A112**	C.D.	13.2	14.1	16.1	18.1	20.0	23.0	24.0	25.9	27.8	30.3	35.8	37.7	40.6
MA112	**A130**	C.D.		12.5	14.5	16.5	18.4	21.3	22.3	24.3	26.2	28.6	34.1	36.1	39.0

33A Belt Section Pitch Lengths

Pulley Combination Driver	Pulley Combination Driven	MM→ / Inches→	1500 / 59.2	1600 / 63.0	1700 / 66.9	1750 / 68.9	1800 / 70.9	1900 / 74.8	2000 / 78.7	2120 / 83.5	2300 / 90.6	2400 / 94.5	2500 / 98.4	2650 / 104.3	2800 / 110.2
MA112-33	**A130-33**	C.D.	16.2	18.1	20.0	21.0	22.0	24.0	25.9	28.3	31.9	33.8	35.8	38.7	41.7

MA Series 40–125 hp

Asymmetric Fixed Center Distance Drives



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Asymmetric Belt Pulley Drives

Instead of two identically angled V-shaped belt faces, Asymmetric Variable Speed pulleys pair a V-angled face with a nearly flat (2º) fixed face. The resulting design produces some important features:

- **Stable Belt Center Line:**

As the fixed pulley face is nearly perpendicular, the belt center line movement throughout the entire pitch diameter range is negligible. Belt alignment with the driven sheave is maintained and crosswise wear on belts is reduced.

- **Compact and Simple**

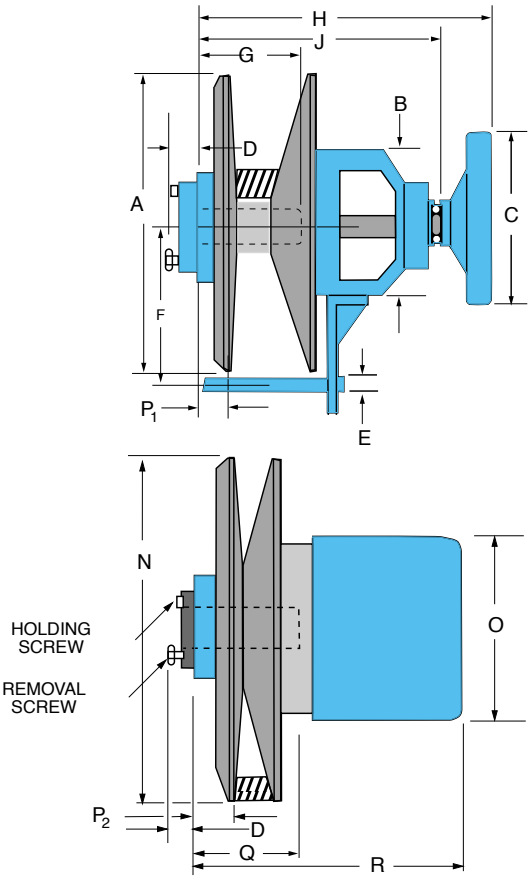
Asymmetric drives require a minimum of space in a C-Flow configuration relative to their horsepower capacity. Installation alignment can be checked simply by laying a straight edge along the back of the fixed disks. The reduction of parts in the single sliding face design minimizes the possibility of a critical breakdown and simplifies repairs and replacement of parts.

- **Stable and Low Overhung Load On Bearings**

The C-Flow configuration of Asymmetric Drives and the nearly perpendicular angle of the fixed pulley face locates the point of bending moment close to mounting shaft bearings. The peripheral support of the cam and cam follower torque-sensing mechanism also reduces wear on the sliding face bearing surface. Use of interchangeable collet bushings eliminates side wobble and vibration due to bad fits between motor spindle and pulley shaft.

- **Automatic Belt Tensioning**

Incorporated in the automatic variable speed pulleys is Hi-Lo's exclusive belt-tensioning device. The cam and cam follower mechanism adjusts belt tension to the load requirement and stabilizes the pitch diameter setting regardless of load fluctuations.



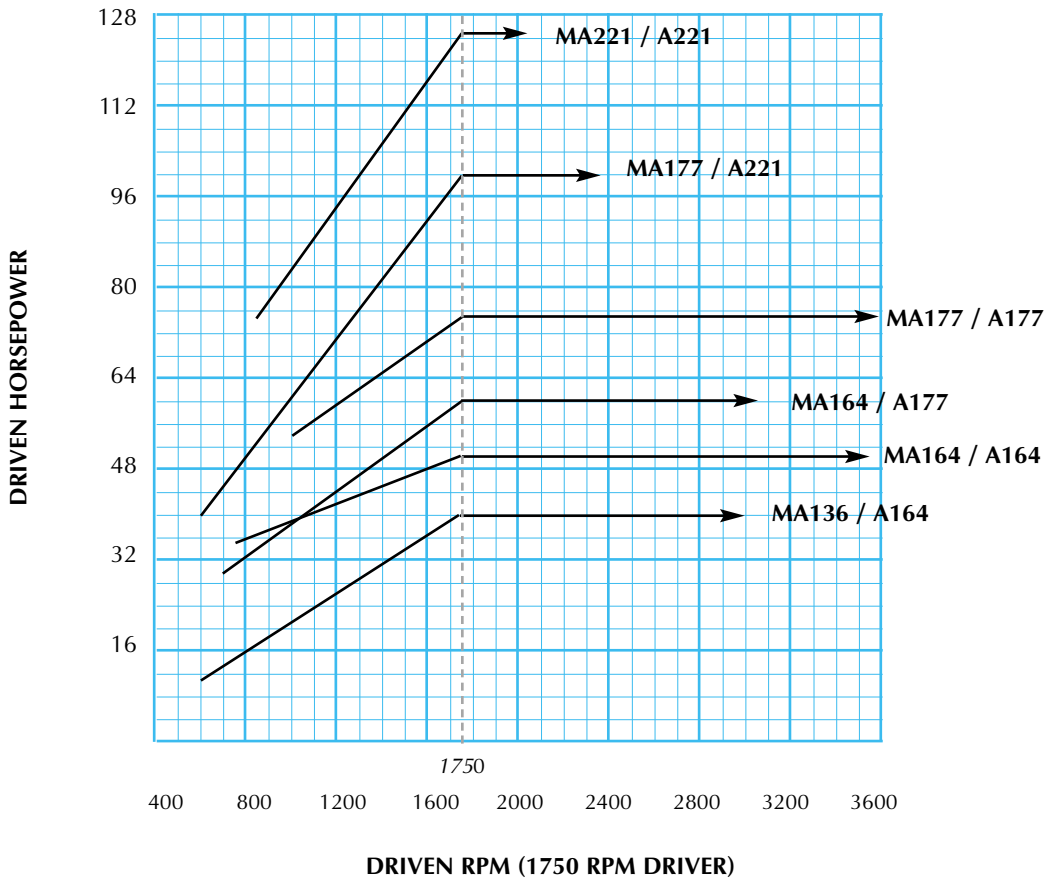
Dimensions • MA Series 40–125 HP

All dimensions are in inches

Pulley Combination Driver	Pulley Combination Driven	A	B	C	D	E	F Min.	G	H	J Max.	P_1	N	O	P2	Q	R	Stock Bores or Collet Sizes	Hand Wheel Turns
MA136		13.6	6.3	7.9		.63	7.7	4.3	13.2	11.7	1.75						1.625•1.875•2.125	15.9
	A164				1.00							16.4	7.28	1.75	5.5	10.2	SK	
MA164		16.4	7.49	7.9	1.00	.67	9.0	5.5	14.7	12.9	1.75						SK	15.9
	A164				1.00							16.4	7.28	1.75	5.5	10.2	SK	
MA164		16.4	7.49	7.9	1.00	.67	9.0	5.5	14.7	12.9	1.75						SK	15.9
	A177				1.13							17.7	8.98	2.50	5.5	13.6	SF	
MA177		17.7	9.46	9.8	1.13	.79	9.7	5.5	17.0	15.0	2.5						SF	12.0
	A177				1.13							17.7	8.98	2.50	5.5	13.6	SF	
MA177		17.7	9.46	9.8	1.13	.79	9.7	5.5	17.0	15.0	2.5						SF	12.0
	A221				1.13							22.1	10.0	2.50	6.7	15.0	SF	
MA221		22.1	12.2	9.8	1.13	.79	11.8	6.6	22.0	17.9	2.5						SF	12.0
	A221				1.13							22.1	10.0	2.50	6.7	15.0	SF	

Standard Bore Sizes for Collet #510: .75, .875, 1, 1.125, 1.25, 1.375
#7713: 1.375, 1.5, 1.625, 1.875

Horsepower Curve • 1750 RPM Driver



Specifications • MA Series 40–125 HP

All dimensions are in inches

HP Ratings 1750 RPM Driven RPM 1750 to Max.	HP Ratings 1750 RPM Driven RPM at Min.	HP Ratings 1150 RPM Driven RPM 1150 to Max.	HP Ratings 1150 RPM Driven RPM at Min.	Torque @1-1 Ratio	Driven RPM 1750 RPM Min.	Driven RPM 1750 RPM Max.	Driven RPM 1150 RPM Min.	Driven RPM 1150 RPM Max.	Ratio	Pulley Combination Driver	Pulley Combination Driven	Belt Size	Pitch Diameter Driver Min.	Pitch Diameter Driver Max.	Pitch Diameter Driven Min.	Pitch Diameter Driven Max.	Pitch Diameter 1-1 Ratio
40.00	11.40	25.00	7.60	1440	600	3000	400	2000	5:1	MA136	A164	36A	4.30	13.0	6.43	15.7	10.5
50.00	35.00	30.00	23.00	1800	784	3580	520	2340	4.5:1	MA164	A164	36A	6.43	15.7	6.43	15.7	11.6
60.00	30.00	40.00	19.00	2160	700	3220	460	2118	4.6:1	MA164	A177	36A	6.43	15.7	7.60	17.0	12.2
75.00	55.00	50.00	36.00	2700	1010	3000	670	1988	3:1	MA177	A177	36A	7.16	17.0	7.60	17.0	13.5
100.00	40.00	60.00	26.00	3600	595	2380	397	1597	4:1	MA177	A221	36A	7.16	17.0	12.50	21.5	15.0
125.00	75.00	100.00	49.00	5400	838	2055	559	1370	2.5:1	MA221	A221	36A	10.00	17.4	14.80	21.5	16.2

Pre-Engineered Belt and Center Distance Selection • MA Series 40–125 HP

Pulley Combination Driver	Pulley Combination Driven	MM inches	36A Belt section Pitch Lengths 1800 70.9	1900 74.8	2000 78.7	2120 83.5	2250 88.6	2400 94.5	2500 98.4	2600 102.4	2700 106.3	2800 110.2	3000 118.1	3200 126.0
MA136	A164	C.D.	19.0	20.9	22.9	25.3	27.8	30.8	32.7	34.7	36.7	38.6	42.6	46.5
MA164	A164	C.D.	17.2	19.2	21.2	23.5	26.1	29.3	31.0	33.0	34.9	36.9	40.8	44.8
MA164	A177	C.D.		18.2	20.2	22.6	25.1	28.1	30.1	32.0	34.0	35.9	39.9	43.8
MA177	A177	C.D.			18.2	20.5	23.1	26.1	28.0	30.0	32.0	33.9	37.9	41.8
MA177	A221	C.D.						23.7	25.7	27.7	29.7	31.6	35.6	39.5
MA221	A221	C.D.										29.7	33.7	37.6

To determine unlisted Belt Lengths and Center Distances, use these formulas:

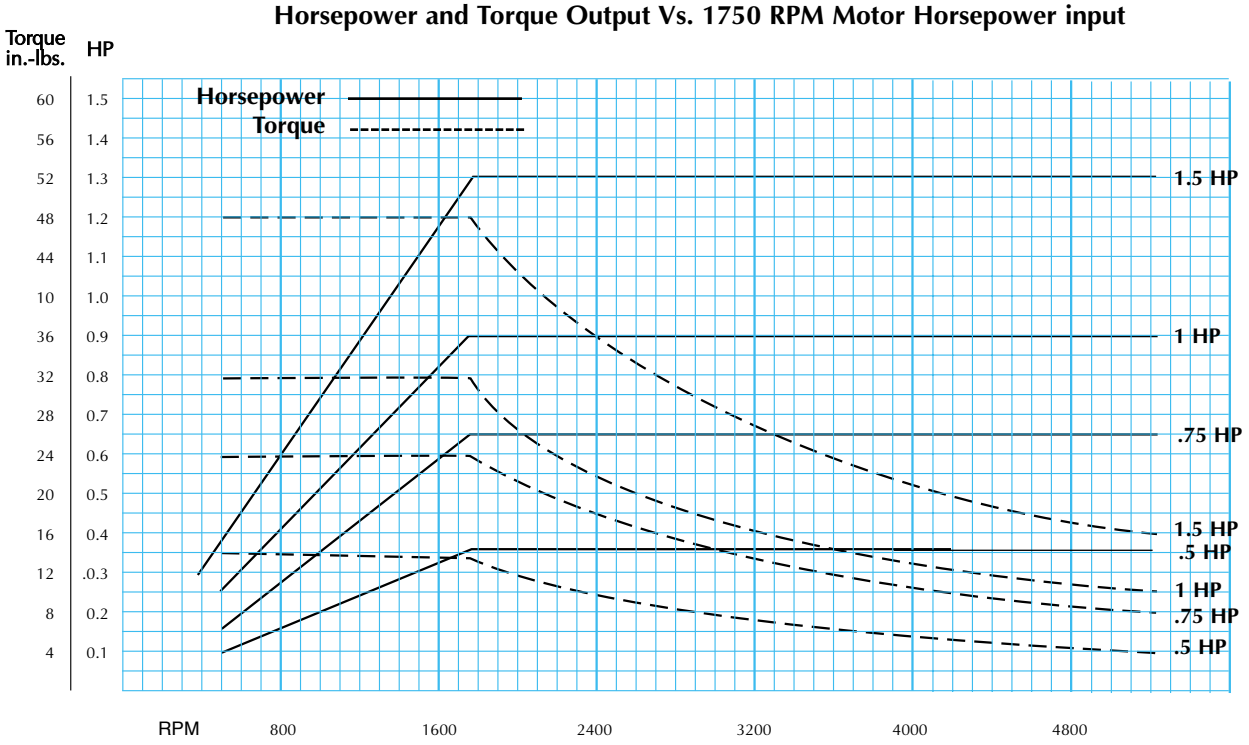
$L = (2C + 3.14D)$

$C = \frac{(L - 3.14D)}{2}$

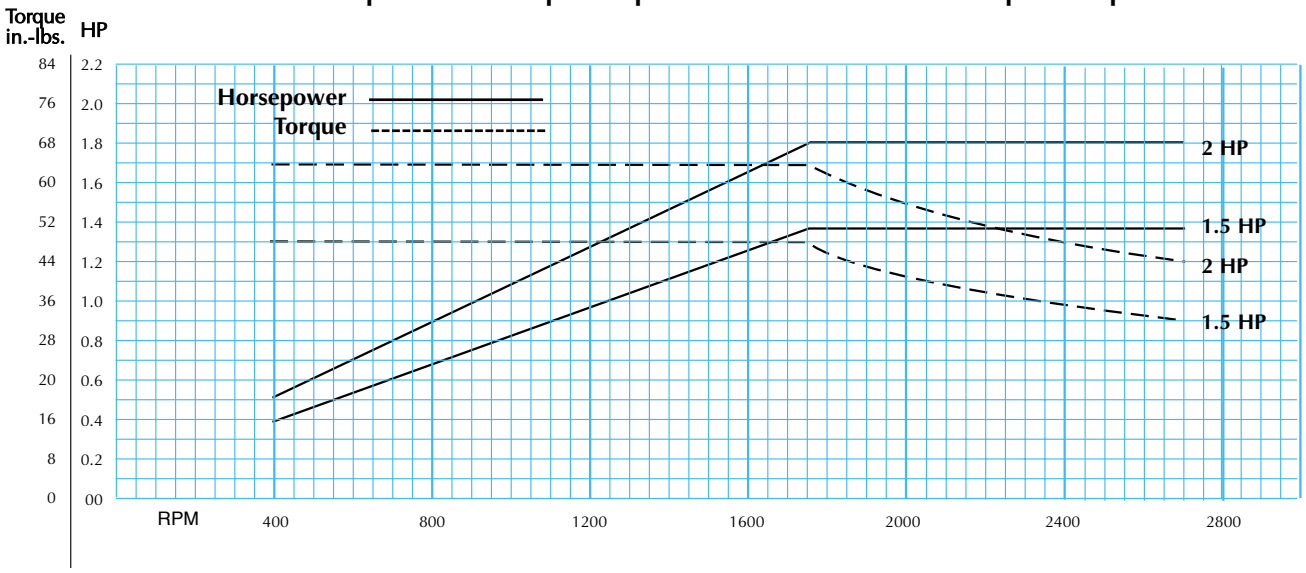
C = Center Distance
D = 1 to 1 Pitch Diameter
L = Belt Pitch Length

VARI-Mod Performance Data

Model 6060 VARI-Mod
Horsepower and Torque Output Vs. 1750 RPM Motor Horsepower input



Model 6075 VARI-Mod
Horsepower and Torque Output Vs. 1750 RPM Motor Horsepower input



Transmission Ratings and Speed Ranges

Model	*Output RPM 1725 RPM		*Output RPM 1140RPM		Motor HP	Output HP 1725 RPM		Output Torque (In.-lb.s) 1725 RPM		Output HP 1140 RPM		Output Torque (In.-lb.s) 1140 RPM	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
6060	550	4950	360	3270	.5	.11	.35	13	5	.11	.35	19	7
					.75	.21	.65	24	9	.21	.65	32	14
					1	.28	.87	32	11	.28	.87	48	17
					1.5	.41	1.30	47	17	NA	NA	NA	NA
6075	450	2700	300	1800	1.5	.35	1.35	49	32	.35	1.35	74	47
					2	.46	1.80	65	42	NA	NA	NA	NA

*When mounted to a reducer, the output RPM range is found by dividing the gearless range by the reducer ratio.

Hi–Ratio Compound Pulleys

Hi-Ratio Compound Pulleys for .25 and .5 HP drives provide economy and exceptional efficiency at speed ratios up to 7 to 1. Pulley faces are made of highly durable plastic containing special additives to ensure long service life.

The pulley itself is comprised of two parts, either of which can be used independently. These are:

1. HR-2 Variable Speed Pulley Assembly which is needle-bearing mounted on a hardened and ground countershaft. It requires a control of some type for operation.
2. HRB-2 Control Base. On the majority of applications, this base eliminates the necessity for a pivoted motor base to maintain proper belt tension.

Operating Principle

The Hi-Ratio Pulley is needle-bearing mounted on a hardened and ground crankshaft. Speed variation is accomplished by moving the countershaft between the driving and driven sheaves. Movement towards the driver (Fig. 1) reduces the driven speed. Movement away from the driver (Fig. 2) increases the driven speed..

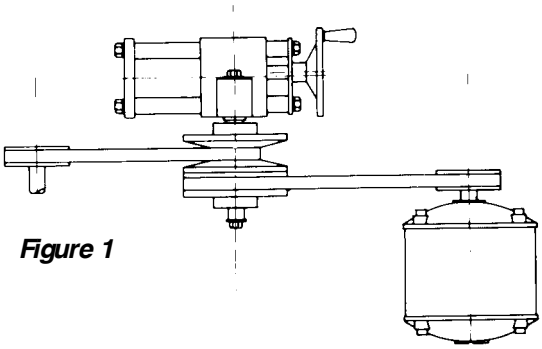


Figure 1

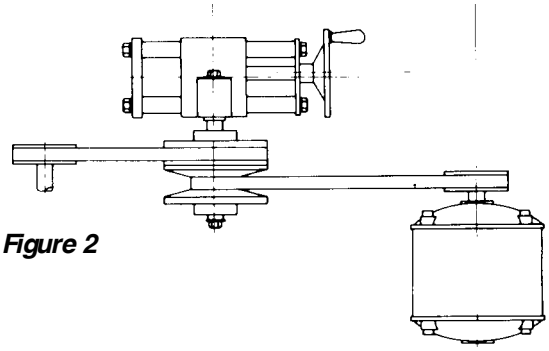


Figure 2

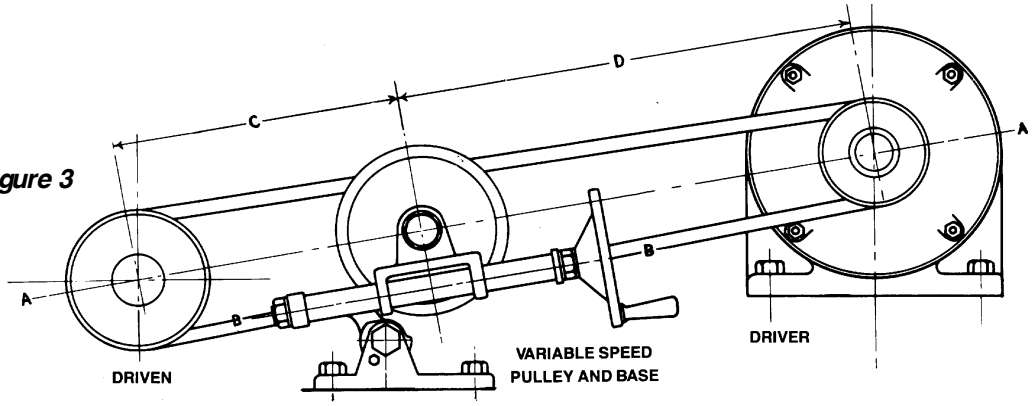
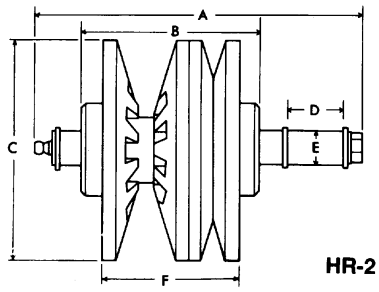


Figure 3



HR-2

Engineering Data

Hi-Ratio Pulleys	Ratio	Belt Size	Max. P.D.	Min. P.D.	Mean P.D.	Movement Required for Max. Speed Range	A	B	C	D	E	F	Approx. Wts. With Shaft	Approx. Wts. Without Shaft
145HR-2	6-1	4L,A	4.60	1.875	3.25	2.125	6.5	3.875	4.75	1.19	.75	2.875	2.5 lbs.	1.75 lbs.
165HR-2	7.2-1	A	6.50	2.40	4.50	3.375	8.06	4.75	6.75	1.69	1.0	3.875	6 lbs.	4 lbs.

Engineering Data • Hi-Ratio Pulleys

Model	Horse Power Max.	Horse Power Min.	Motor or Driver to Hi-Ratio Pulley RPM.	Sheave P.D.	Center Distance	Belt Size	Belt Pitch Length	Center Distance	Hi-Ratio Pulley to Driven Shaft Belt Pitch Length	Sheave P.D.	Driven RPM Max.	Driven RPM Min.
								11.75	32.4	2.4	4290	715
								13.25	39.4	4.8	2120	360
145 HR-2	.5	.25	1750	2.4	13.75	A	36.4	15.75	44.4	6.0	1720	286
								15.0	49.4	9.0	1145	191
								18.5	52.4	12.0	860	143
								13.25	36.4	3.0	4290	715
								13.25	39.4	4.8	2680	445
145 HR-2	.5	.25	1750	3.0	13.25	A	36.4	15.75	44.4	6.0	2145	358
								15.0	49.4	9.0	1430	238
								18.5	52.4	12.0	1070	179
								14.25	39.4	3.6	4300	715
								13.25	39.4	4.8	3680	600
145 HR-2	.5	.25	1750	3.6	12.875	A	36.4	15.75	44.4	6.0	2572	430
								15.0	49.4	9.0	1715	286
								18.5	52.4	12.0	1286	215
								11.75	36.4	3.6	3920	540
165 HR-2	1										2370	330
											1690	262
											1185	165
											4700	650
165 HR-2	1										2844	395
											1890	262
											1422	198
											4700	650
165 HR-2	1										2485	345
								15.25	56.4	12.0	1650	230

DISCONTINUED

The output speeds are examples of the many possible variations obtainable. By using other sheave diameters on the driven shaft, many additional variations are possible. Use the formula below to derive speed ranges not covered by the table.

145 HR-2

Max. RPM of Driven = $\frac{\text{P.D. Driver}}{\text{P.D. Driven}}$ x 2.43 Motor x RPM.

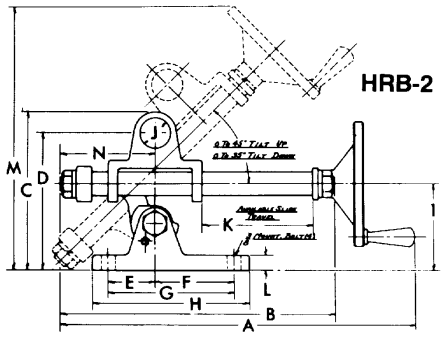
Min. RPM of Driven = $\frac{\text{P.D. Driver}}{\text{P.D. Driven}}$ x .41 x Motor RPM.

145 HR-2

Max. RPM of Driven = $\frac{\text{P.D. Driver}}{\text{P.D. Driven}}$ x 2.70 Motor x RPM.

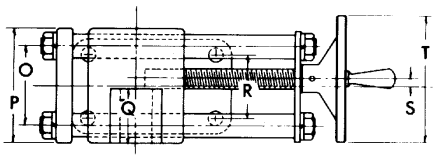
Min. RPM of Driven = $\frac{\text{P.D. Driver}}{\text{P.D. Driven}}$ x .37 x Motor RPM.

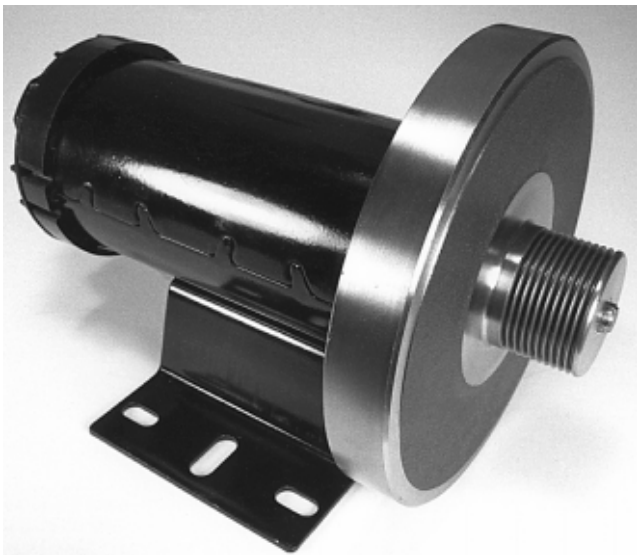
HRB-2 Base



All dimensions are in inches

Hi-Ratio Control Bases	145HRB-2	165HRB-2
A	11.75	11.75
B	9.125	9.125
C	5.375	5.375
D	4.625	4.625
E	1.5	1.5
F	2.5	2.5
G	4	4
H	5	5
I	3	3
J	.75	1
K	4.25	4.25
L	.5	.5
M	9.25	9.25
N	2.625	2.625
O	2.5	2.5
P	3.625	3.625
Q	1.75	1.75
R	2	2
S	0	0
T	4	4
Approx. Weight	8.5	8.5





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Hi-Lo FlySheave smooths out your drive

Our robotically machined flywheel with integrated poly v-belt sheave and fan provides a perfectly balanced component for your drive.

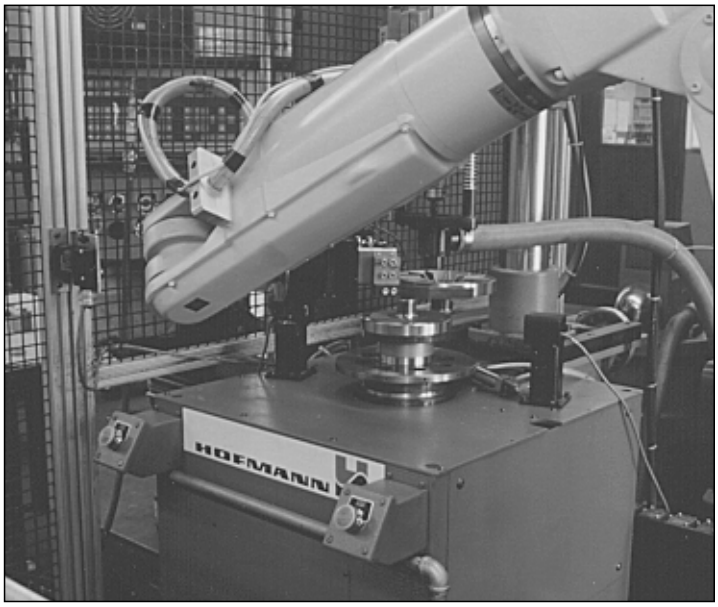
The Hi-Lo FlySheave is designed to improve the overall balance of a motor, sheave, fan and flywheel drive system. The difficulties of mounting separate components and maintaining system balance are dramatically improved by combining the three parts into one perfectly machined part:

- Robotic technology keeps our manufacturing and quality control process absolutely consistent.
- Single point turning of the Poly V-Sheave grooves means grooves remain smooth and consistent—reducing vibration and prolonging belt life.
- Automated balancing equipment determines the exact amount and location of any imbalance. FlySheaves are so precisely balanced that they will out-perform typical print specifications.
- Tool-life management system keeps cutting tools sharp and assures precise machining.

With millions of our FlySheave in the field we are proud of our zero-defect program. Consistency in material, tooling, machining, and balancing will provide you with the exacting quality that you need in your components.

For specifications, pricing or information on manufacturing to your specifications, please call 800-373-2279.

If our stock designs don't exactly match your needs, use our technology and expertise to manufacture a FlySheave to your custom specifications.



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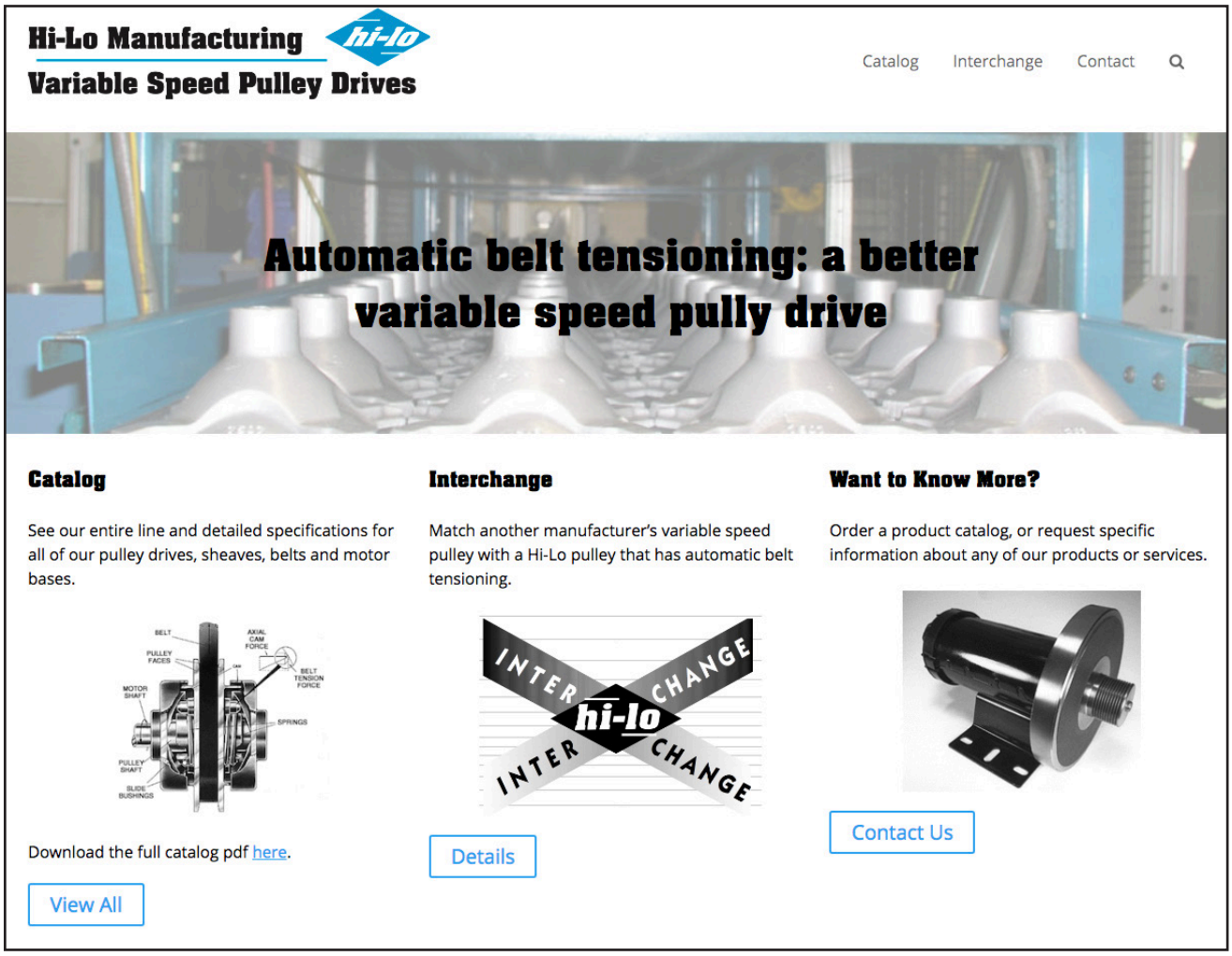

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