

Datum System

In December, 1987, RMA/MPTA adopted Standard IP20-1988. This standard superseded IP20-1977 and affected the A, B, C, and D belts and sheaves. Those products in this catalog are in accordance with IP20-1988 which incorporates the Datum Diameter System.

The Datum System specifies the Datum Diameter as the effective diameter for determining the pitch length of the belt for center distance calculation. In this catalog, Datum Diameter (D.D.) is now listed for the A, B, C, and D sheaves and is equal to the old Pitch Diameter (P.D.) shown in previous catalogs.

Belt Velocity

Belt velocity is not needed for calculation of drives, as the horsepower ratings shown are based on the R.P.M. of the sheave. If belt velocity is desired for any reason, use the formula:

Belt Velocity in Feet per Minute (FPM) =
D.D. or P.D. of Sheave x .2618 x Speed of Sheave (RPM)

CAST IRON SHEAVES MUST NOT BE USED BEYOND 6500 FPM BELT SPEED. Since the majority of stock sheaves are made of cast iron, we list no ratings above 6500 FPM.

Some types of belts lose ratings before they reach 6500 FPM and other types continue to increase beyond 6500 FPM. The Basic Rating Tables and the Drive Selection Tables reflect these variations.

Special Balance

Functionally, speeds up to 6500 FPM are acceptable; however, on applications where vibration requirements are critical, special balancing (usually dynamic) for speeds above 5000 FPM may be considered. Factors to be considered for special balance requirements are: rigidity of drive mounting, whether noise created by a level of vibration would be prohibitive, etc. Many drives are in service running at speeds up to 6500 FPM without special balancing.

Center Distance and Belt Length

The Belts Lengths listed in the Drive Selection Tables can be interpolated for belt size, center distance and "F" factor from the shortest to the longest shown.

Interpolation

For every inch of belt length difference there is approximately 1/2 inch center distance change. All belt numbers reflect a relation if it is Pitch Length, Outside Length or Inside Length. An A26 belt is 2" longer than an A24 belt; a B105 belt is 15" longer than a B90 belt; a 3V335 belt is 8.5" longer than a 3V250 belt, etc.

Interpolation Example:

If an A128 belt gives 50.0" C.D. with 1.12 "F" factor and an A96 gives 34.0 C.D. with 1.05 "F" factor, then an A112 belt gives 42.0 C.D. with 1.09 "F" factor.

If a 5V1200 belt gives 83.1" C.D. with 1.07 "F" factor and a 5V1600 gives 63.1 C.D. with 1.03 "F" factor, then a 5V1800 belt gives 73.1 C.D. with 1.05 "F" factor.

Center Distance and Belt Lengths determined by interpolation are usually close enough as all drives should provide for take-up as indicated on page B-25. If closer calculation is necessary for any reason use the following formula:

$$L = 2C + 1.57 (D + d) + \frac{(D - d)^2}{4C}$$

where:

- L = Pitch Length of Belt
- C = Center Distance
- D = Datum or Pitch Diameter of Large Sheave
- d = Datum or Pitch Diameter of Small Sheave

Driven Speed Variations

All V-Belt Drives will vary slightly from the speeds shown in the Drive Selection Tables. These variations are due to different motor speeds depending on load, changing frequencies (on A.C. Motors) or voltage (on D.C. Motors), varying tensions and resulting slip, and allowable manufacturing tolerances in belts and sheaves. Also, actual sheave pitch diameters and actual belt pitch lines have been changed slightly over the years by all manufacturers but catalog data has not been changed to reflect this.

The Drive Selection Tables are still very usable and ratios still can be calculated from published sheave pitch or datum diameters since the variations are small and historically have caused very few problems through out the vast range of V-Belt Drive applications. A good rule of thumb is to design a belt drive based on ±3% speed variation.

In the few instances where very close speed tolerances are required, contact Browning for assistance or use the Browning EDGE® Selection Program.

Speed-Up, Quarter-Turn, and V-Flat Drives

These drives occur infrequently and should be referred to Browning for special design considerations.

Table No. 1 Belt Section Selection Chart

HP	Belt Section			
	A	AX	B	CX
1/2	A	AX		
3/4	A	AX		
1	A	AX		
1 1/2	A	AX		
2	A	AX		
3	AX	A	BX	
5	BX	AX	B	A
7 1/2	BX	AX	B	3VX
10	BX	B	AX	3VX
15	BX	3VX	AX	B
20	BX	3VX	B	
25	5VX,5V	3VX	B	
30	5VX,5V	3VX	B	
40	5VX,5V	B	3VX	
50	5VX,5V	BX	B	CX
60	5VX,5V	BX	B	CX
75	5VX,5V	CX	BX	C
100	5VX,5V	CX	C	
125	5VX,5V	CX	C	
150	5VX,5V	CX	C	
200	5VX,5V	CX		
250	5VX,5V	CX		

Best Drive will usually be found by using Belt Section from the first column, If, for any reason, such as sheave shortage, this drive is not suitable, go to the next column.

"AX" drives are found in the "A" Drive Selection Tables; "BX" in the "B" Tables. etc.

