



Design Manual for Power Transmission Belts



DRB[®]

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Classical V-Belts

(A, B, C, D)

Scope

This manual covers V-belt drives used primarily for power transmission in industrial applications. One or more V-belts may be used on a drive, as required, to transmit the horsepower load. In general, the drives are in the integral-horsepower class as distinguished from light duty or fractional horsepower drives.

This manual covers the four classical V-belt cross sections and pulley groove sizes designated A, B, C, D.

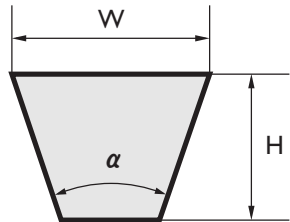
Dimensions of V-belts and pulleys together with basic design data are covered in this manual.

This manual does not apply to automotive and agricultural drives.

Cross Sections of V-Belt

Nominal dimensions of the four cross sections are given in **Table 1**.

Table 1. *Nominal Dimensions of V-belt Cross Sections in mm*

Cross Section	W	H	α	Features
A	12.5	9.0	40°	 <p>The diagram illustrates the cross-section of a V-belt, which is a trapezoid. The top width is labeled 'W', the height is labeled 'H', and the angle between the top edge and the side edge is labeled 'α'.</p>
B	16.5	11.0	40°	
C	22.0	14.0	40°	
D	31.5	19.0	40°	

V-belt Pulleys

Groove angles and dimensions for pulleys shall confirm to **Figure 1** and **Table 2**.

Figure 1. Standard Groove Dimensions.

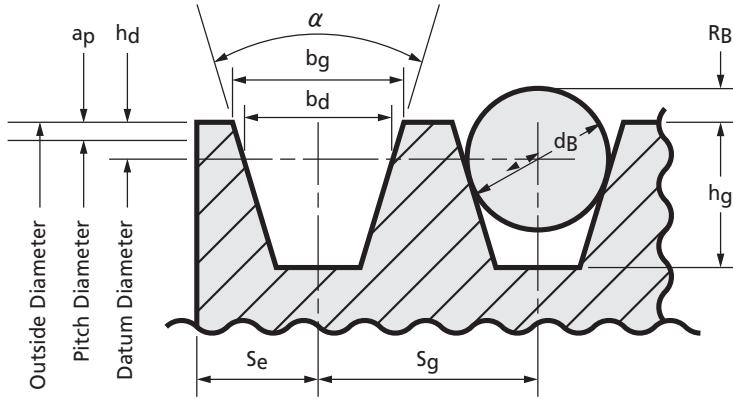


Table 2. Standard Groove Dimensions in mm

Cross Section	Datum Diameter Range	α Groove Angle $\pm 0.33^\circ$	bd Ref	bg	hg Min	2hd Ref	RB Min	dB ± 0.01	Sg ± 0.64	2ap		
A	Up thru 137	34	10.62	12.5	11.68	6.35	3.76	11.11	15.88	+2.29		
	Over 137	38		± 0.13						12.8	3.78	-1.57
B	Up thru 178	34	13.46	16.2	13.97	8.89	4.80	14.29	19.05	+3.05		
	Over 178	38		± 0.15						16.5	4.83	-1.65
C	Up thru 203	34	19.23	22.3	19.05	10.16	6.96	19.84	25.4	+4.06		
	Over 203 to & incl. 305	36		± 0.18						22.5	7.01	17.48
	Over 305	38								22.7	7.04	-1.78
D	Up thru 330	34	27.33	31.9	25.91	15.24	10.41	28.58	36.53	+5.59		
	Over 330 to & incl. 432	36		± 0.20						32.3	10.41	22.23
	Over 432	38								32.6	10.44	-2.03

Minimum Pulley Diameter

The minimum pulley diameters recommended for standard V-belts are shown in **Table 3**.

Table 3. Minimum Pulley Diameter in mm

Cross Section	A	B	C	D
Minimum Pitch Diameter	75	137	229	330

Note : The smaller the pulley diameter, the less the belt life. Do not use the pulleys which are below the minimum recommended.

Center Distance and Belt Length

The relation between center distance and length is given by the following formula :

$$L_p = 2C + 1.57(D_p + d_p) + \frac{(D_p - d_p)^2}{4C}$$

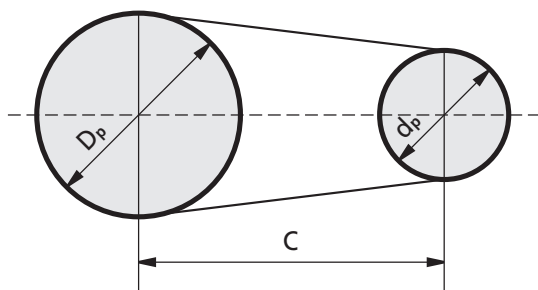
This formula can be solved for center distance instead of belt length as follows :

$$C = \frac{b + \sqrt{b^2 - 2(D_p - d_p)^2}}{4}$$

Where

- L_p : Effective pitch length of belt(mm)
- C : Center distance(mm)
- D_p : Pitch diameter of large pulley(mm)
- d_p : Pitch diameter of small pulley(mm)
- b : $L_p - 1.57(D_p + d_p)$

Figure 3. Center Distance and Belt Length



Design Factor

Service Factors

The selection of a V-belt drive for any application should be based on the nature of the load and the type of driving unit. Service Factors for different kinds of driven machines combined with different types of driving units are shown in **Table 4**. The driven machines are representative samples only. Select a driven machine whose load characteristics most closely approximate those of the machine being considered.

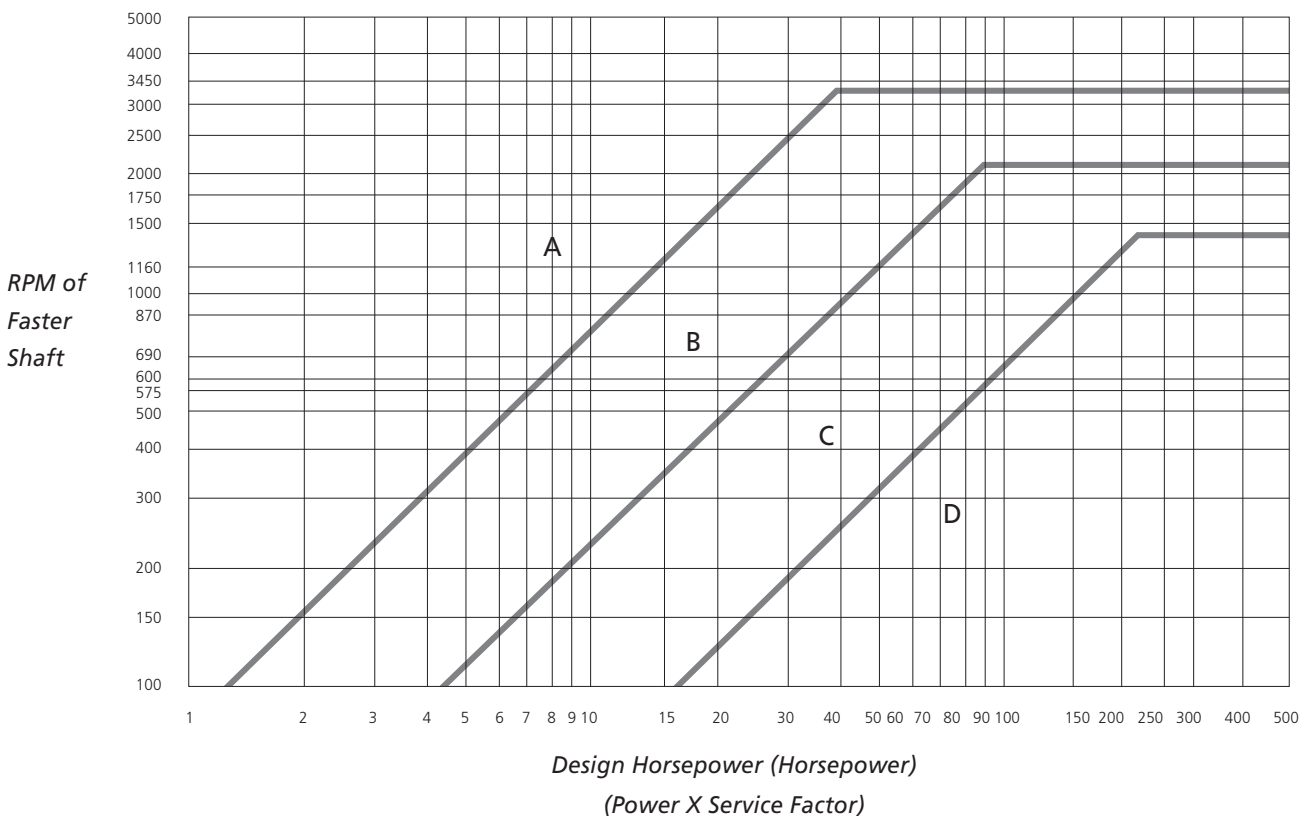
Table 4. Suggested Service Factors for V-belt Drives

Type of Driven Machine	Types of Driving Units					
	AC Motors : Normal Torque, Squirrel Cage, Synchronous and Split Phase. DC Motors : Shunt Wound, Multiple Cylinder Internal Combustion Engines.			AC Motors : High Torque, High Slip, Repulsion-Induction, Single Phase Series Wound and Slip Ring. DC Motors : Series Wound and Compound Wound, Single Cylinder Internal Combustion Engines, Line Shafts, Clutches.		
	Intermittent Service(3-5 Hours Daily of Seasonal)	Normal Service(8-10 Hours Daily)	Continuous Service(16-24 Hours Daily)	Intermittent Service(3-5 Hours Daily of Seasonal)	Normal Service(8-10 Hours Daily)	Continuous Service(16-24 Hours Daily)
Agitators for Liquids Blowers and Exhausters Centrifugal Pumps and Compressors Fans up to 10 HP Light Duty Conveyors	1.0	1.1	1.2	1.1	1.2	1.3
Belt Conveyors for Sand, Grain, etc. Dough Mixers Fans Over 10 HP Generators Line Shafts Laundry Machinery Machine Tools Punches-Presses-Shears Printing Machinery Positive Displacement Rotary Pumps Revolving and Vibrating Screens	1.1	1.2	1.3	1.2	1.3	1.4
Brick Machinery Bucket Elevators Exciters Piston Compressors Conveyors(Drag-Pan-Screw) Hammer Mills Paper Mill Beaters Piston Pumps Positive Displacement Blowers Pulverizers Saw Mill and Woodworking Machinery Textile Machinery	1.2	1.3	1.4	1.4	1.5	1.6
Crushers(Gyratory-Jaw-Roll) Mills(Ball-Rod-Tube) Hoists Rubber Calenders-Extruders-Mills	1.3	1.4	1.5	1.5	1.6	1.8

Cross Section Selection

Use the chart (Figure 4) as a guide to the V-belt cross section to use for any combination of design horsepower and speed of faster shaft. When the intersection of the design horsepower and speed of faster shaft falls near a line between two areas on the chart, it is always desirable to investigate the possibilities in both areas.

Figure 4. Selection of V-belt Cross Section



Horsepower Ratings

The horsepower ratings recommended for standard belts of average length and with 180 degree arc of contact are shown in Tables 9 through 12.

Corrected Horsepower Rating for One Belt

The corrected horsepower rating of one belt is obtained by multiplying the horsepower rating from Tables 9 through 12 by the arc of contact correction factor and by the length correction factor.

Number of Belts

The number of belts required for an application is obtained by dividing the design horsepower by the corrected horsepower rating for one belt.

Arc of Contact Correction Factor

For arc of contact other than 180 degrees determine the arc of contact correction factor (F_θ) from Table 5.

Table 5. Arc of Contact Correction Factor (F_θ)

$\frac{D_p - d_p}{C}$	Arc of contact on small pulley (degree)	Correction factor (F_θ)
0.00	180	1.00
0.10	174	0.99
0.20	169	0.97
0.30	163	0.96
0.40	157	0.94
0.50	151	0.93
0.60	145	0.91
0.70	139	0.89
0.80	133	0.87
0.90	127	0.85
1.00	120	0.82
1.10	113	0.80
1.20	106	0.77
1.30	99	0.73
1.40	91	0.70
1.50	83	0.65

$$\text{Arc of Contact(degree)} = 180 - \frac{60(D_p - d_p)}{C}$$

D_p : Pitch diameter of large pulley(mm)

d_p : Pitch diameter of small pulley(mm)

C : Center distance (mm)

Length Correction Factor

For belts shorter or longer than average length determine the length correction factor (F_L) from **Table 6**.

Table 6. Length Correction Factors (F_L)

Std. Length Designation	Cross Section			
	A	B	C	D
26	0.78			
31	0.82			
35	0.85	0.80		
38	0.87	0.82		
42	0.89	0.84		
46	0.91	0.86		
51	0.93	0.88	0.80	
55	0.95	0.89		
60	0.97	0.91	0.83	
68	1.00	0.94	0.85	
75	1.02	0.96	0.87	
80	1.04			
81		0.98	0.89	
85	1.05	0.99	0.90	
90	1.07	1.00	0.91	
96	1.08		0.92	
97		1.02		
105	1.10	1.03	0.94	
112	1.12	1.05	0.95	
120	1.13	1.06	0.96	0.88
128	1.15	1.08	0.98	0.89
144		1.10	1.00	0.91
158		1.12	1.02	0.93
173		1.14	1.04	0.94
180		1.15	1.05	0.95
195		1.17	1.08	0.96
210		1.18	1.07	0.98
240		1.22	1.10	1.00
270		1.24	1.13	1.02
300		1.27	1.15	1.04
330			1.17	1.06
360			1.18	1.07
390			1.20	1.09
420			1.21	1.10
480				1.13
540				1.15
600				1.17
660				1.18

Standard Lengths of V-Belts

Available Sizes Shown in Shaded Areas

The belt length indicates cross sections A to D. (Please contact us for other types and lengths)

Figure 5

Std. Length Designation	Belt Length (mm)	Cross Section			
		A	B	C	D
24	610	■			
25	635	■			
26	660	■			
27	686	■			
28	711	■	■		
29	737	■	■		
30	762	■	■		
31	787	■	■		
32	813	■	■		
33	838	■	■		
34	864	■	■		
35	889	■	■		
36	914	■	■		
37	940	■	■		
38	965	■	■		
39	991	■	■		
40	1016	■	■		
41	1041	■	■		
42	1067	■	■		
43	1092	■	■		
44	1118	■	■		
45	1143	■	■		
46	1168	■	■		
47	1194	■	■		
48	1219	■	■		
49	1245	■	■		
50	1270	■	■		
51	1295	■	■	■	
52	1321	■	■	■	
53	1346	■	■	■	
54	1372	■	■	■	
55	1397	■	■	■	
56	1422	■	■	■	
57	1448	■	■	■	
58	1473	■	■	■	
59	1499	■	■	■	
60	1524	■	■	■	
61	1549	■	■	■	
62	1575	■	■	■	
63	1600	■	■	■	
64	1626	■	■	■	
65	1651	■	■	■	
66	1676	■	■	■	
67	1702	■	■	■	
68	1727	■	■	■	
69	1753	■	■	■	
70	1778	■	■	■	
71	1803	■	■	■	
72	1829	■	■	■	
73	1854	■	■	■	
74	1880	■	■	■	
75	1905	■	■	■	
76	1930	■	■	■	
77	1056	■	■	■	
78	1981	■	■	■	
79	2007	■	■	■	
80	2032	■	■	■	
81	2057	■	■	■	
82	2083	■	■	■	
83	2108	■	■	■	
84	2134	■	■	■	
85	2159	■	■	■	
86	2184	■	■	■	
87	2210	■	■	■	
88	2235	■	■	■	
89	2261	■	■	■	
90	2286	■	■	■	
91	2311	■	■	■	
92	2337	■	■	■	
93	2362	■	■	■	
94	2388	■	■	■	
95	2413	■	■	■	
96	2438	■	■	■	
97	2464	■	■	■	
98	2489	■	■	■	
99	2515	■	■	■	
100	2540	■	■	■	
101	2565	■	■	■	
102	2591	■	■	■	
103	2616	■	■	■	
104	2642	■	■	■	
105	2667	■	■	■	
106	2692	■	■	■	
107	2718	■	■	■	
108	2743	■	■	■	
109	2769	■	■	■	
110	2794	■	■	■	
111	2819	■	■	■	
112	2845	■	■	■	
113	2870	■	■	■	
114	2896	■	■	■	
115	2921	■	■	■	
116	2946	■	■	■	
117	2972	■	■	■	
118	2997	■	■	■	
119	3023	■	■	■	
120	3048	■	■	■	■
121	3073	■	■	■	■
122	3099	■	■	■	■
123	3124	■	■	■	■

Std. Length Designation	Belt Length (mm)	Cross Section			
		A	B	C	D
124	3150				
125	3175				
126	3200				
127	3226				
128	3251				
129	3277				
130	3302				
131	3327				
132	3353				
133	3378				
134	3404				
135	3429				
136	3454				
137	3480				
138	3505				
139	3531				
140	3556				
141	3581				
142	3607				
143	3632				
144	3658				
145	3683				
146	3708				
147	3734				
148	3759				
149	3785				
150	3810				
155	3937				
160	4064				
165	4191				
170	4318				
175	4445				
180	4572				
185	4699				
190	4826				
195	4953				
200	5080				
205	5207				
210	5334				
215	5461				
220	5588				
225	5715				
230	5842				
235	5969				
240	6096				
245	6223				
250	6350				
255	6477				
260	6604				
265	6731				
270	6858				
275	6985				
280	7112				
285	7239				
290	7366				

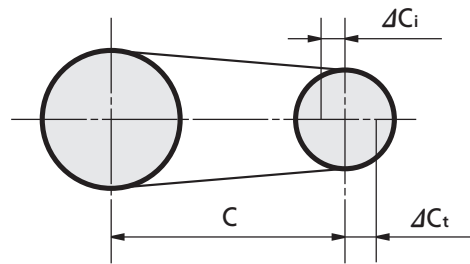
Std. Length Designation	Belt Length (mm)	Cross Section			
		A	B	C	D
295	7493				
300	7620				
305	7747				
310	7874				
315	8001				
320	8128				
325	8255				
330	8382				
335	8509				
340	8636				
345	8763				
350	8890				
355	9017				
360	9144				
365	9271				
370	9398				
375	9525				
380	9652				
385	9779				
390	9906				
395	10033				
400	10160				
405	10287				
410	10414				
415	10541				
420	10668				
425	10795				
430	10922				
435	11049				
440	11176				
445	11303				
450	11430				
455	11557				
460	11684				
465	11811				
470	11938				
475	12065				
480	12192				
485	12319				
490	12446				
495	12573				
500	12700				
505	12827				
510	12954				
515	13081				
520	13208				
525	13335				
530	13462				
535	13589				
540	13716				

Installation and Take-up Allowances

After calculating a center distance from a standard pitch length, make provision for adjusting the center distance as in **Table 7** below to allow for damage-free installation of the belts, for tensioning, and for maintenance of proper tension throughout the life of the belt.

Table 7. Center Distance Allowance for Installation and Take-up in mm

Std. Length Designation	ΔC_i				ΔC_t
	A	B	C	D	
26~38	20	25			25
39~60	20	25	40		35
61~90	20	35	40		50
91~120	25	35	40		65
121~158	25	35	40	50	75
159~195		35	50	50	90
196~240		40	50	50	100
241~270			50	65	115
271~330			50	65	130
331~420			50	65	150
421 & over				75	1.5% of belt length



Horsepower Ratings

The horsepower rating formulas are :

Cross Section	Formula
A	$P_r = d_{pr} \left[1.004 - \frac{1.652}{d_p} - 1.547 \times 10^{-4}(d_{pr})^2 - 0.2126 \log(d_{pr}) \right] + 1.652 \left(1 - \frac{1}{K_{SR}} \right)$
B	$P_r = d_{pr} \left[1.769 - \frac{4.372}{d_p} - 3.081 \times 10^{-4}(d_{pr})^2 - 0.3658 \log(d_{pr}) \right] + 4.372 \left(1 - \frac{1}{K_{SR}} \right)$
C	$P_r = d_{pr} \left[3.325 - \frac{12.07}{d_p} - 5.828 \times 10^{-4}(d_{pr})^2 - 0.6886 \log(d_{pr}) \right] + 12.07 \left(1 - \frac{1}{K_{SR}} \right)$
D	$P_r = d_{pr} \left[7.160 - \frac{43.21}{d_p} - 1.384 \times 10^{-3}(d_{pr})^2 - 1.454 \log(d_{pr}) \right] + 43.21 \left(1 - \frac{1}{K_{SR}} \right)$

Where P_r : The maximum horsepower recommended at 180° arc of contact for a belt of average length. For other lengths and arcs of contact the horsepower obtained from the formula must be multiplied by the appropriate correction factors for length and arc of contact as found in **Tables 3 & 7**.
 d : Pitch diameter of small pulley, inches.
 r : RPM of faster shaft/1000.
 K_{SR} : Speed ratio factor(See **Table 8**)

Table 8. Speed Ratio Factors. R_s

Speed Ratio, D/d Range	Factor R_s
1.00-1.01	1.0000
1.02-1.04	1.0112
1.05-1.07	1.0226
1.08-1.10	1.0344
1.11-1.14	1.0463
1.15-1.20	1.0586
1.21-1.27	1.0711
1.28-1.39	1.0840
1.40-1.64	1.0972
1.65 and over	1.1106

Drive Design Example of V-Belts

Operation conditions

1. Motor : 7.5 HP(5.5kw) Normal Torque 1750rpm
2. Machine : Light duty compressor 970 rpm
3. Center distance : abt. 500mm
4. Operating hours : 24 hours per day

Step	Procedures	Results
1	Calculate the design horsepower $P_d = P_r \times F_s$ P_d : Design horsepower P_r : Rated horsepower F_s : Service factor(Table 4)	$P_d = 7.5 \times 1.2 = 9.0(\text{HP})$
2	Select the proper V-belt section (Figure 4)	Belt section : A
3	Select the pulley diameters ① Choose the minimum pulley diameter (Table 3) ② Find the speed ratio $\text{Speed ratio}(R_s) = \frac{n_1}{n_2}$ ③ Calculate the pitch diameter of large pulley $D_p = R_s \times d_p$ D_p : Pitch diameter of large pulley d_p : Pitch diameter of small pulley n_1 : Speed of small pulley(rpm) n_2 : Speed of large pulley(rpm)	$d_p : 75(\text{mm})$ $R_s = \frac{1750}{970} = 1.8$ $D_p = 1.8 \times 75 = 135(\text{mm})$
4	① Determine the V-belt length(Figure 5) $L_p = 2C + 1.57(D_p + d_p) + \frac{(D_p - d_p)^2}{4C}$ L_p : Effective pitch length C : Center distance ② Calculate the exact center distance of the pulleys after the belt length has been determined. $C = \frac{b + \sqrt{b^2 - 2(D_p - d_p)^2}}{4}$ $b : L_p - 1.57(D_p + d_p)$	$L_p = 2 \times 500 + 1.57(135 + 75) + \frac{(135 - 75)^2}{4 \times 500} = 1331.5(\text{mm})$ Select the nearest standard belt length =1321(A52 Belt)from Table on Pages 8, 9 $b = 1321 - 1.57(135 + 75) = 991.3(\text{mm})$ $C = \frac{991.3 + \sqrt{991.3^2 - 2(135 - 75)^2}}{4} = 495(\text{mm})$
5	Determine the power per belt ① Identify the RPM of the faster shaft in the left hand column of Table 9. Now read across the same Table to the vertical column corresponding to the pitch diameter of small pulley and find the basic horsepower. Using the same Table, read across from the RPM of the faster shaft to the vertical column corresponding to the speed ratio and find the additional horsepower. Add this value to the basic horsepower. Rated horsepower per belt(P_r) = Basic HP + Additional HP ② Determine the arc of contact correction factor(F_θ) from Table 5. ③ Determine the length correction factor(F_L) from Table 6.	$P_r = 1.49 + 0.29 = 1.78(\text{HP})$ $F_\theta = 0.99$ $F_L = 0.94$
6	Calculate the number of belts required where the number of belts $\text{Number of belts} = \frac{P_d}{P_r \times F_\theta \times F_L}$	$\text{Number of belts} = \frac{9.0}{1.78 \times 0.99 \times 0.94} = 5.4$
7	Determine the minimum center distance allowance in Table 7	$\Delta C_i : 20\text{mm}, \Delta C_t : 35\text{mm}$
8	Summarize the V-belt drive design	(Summary) 1. Pitch diameter of small pulley : 75mm 2. Pitch diameter of large pulley : 135mm 3. Center distance : 495mm 4. Belts to be used : A52, 6 pcs.

Table 9. Basic Horsepower Ratings("A" Section)

Unit : HP

RPM of Faster Shaft	Rated HP per belt for small pulley pitch diameter													RPM of Faster Shaft	Additional HP per belt for speed ratio									
	65	70	75	80	85	90	95	100	105	110	115	120	125		1.00 ~1.01	1.02 ~1.04	1.05 ~1.07	1.08 ~1.10	1.11 ~1.14	1.15 ~1.20	1.21 ~1.27	1.28 ~1.39	1.40 ~1.64	1.65 & over
1160	0.76	0.95	1.13	1.31	1.49	1.66	1.84	2.01	2.19	2.36	2.53	2.70	2.87	1160	0.00	0.02	0.04	0.06	0.08	0.11	0.13	0.15	0.17	0.19
1750	0.97	1.23	1.49	1.75	2.00	2.25	2.50	2.75	2.99	3.23	3.47	3.71	3.94	1750	0.00	0.03	0.06	0.10	0.13	0.16	0.19	0.22	0.26	0.29
3450	1.28	1.74	2.18	2.62	3.05	3.47	3.88	4.28	4.67	5.05	5.43	5.79	6.15	3450	0.00	0.06	0.13	0.19	0.25	0.32	0.38	0.44	0.50	0.57
200	0.22	0.25	0.29	0.33	0.37	0.40	0.44	0.48	0.51	0.55	0.59	0.62	0.66	200	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03
400	0.36	0.44	0.51	0.58	0.65	0.72	0.79	0.85	0.92	0.99	1.06	1.12	1.19	400	0.00	0.01	0.01	0.02	0.03	0.04	0.04	0.05	0.06	0.07
600	0.49	0.59	0.69	0.79	0.89	0.99	1.09	1.19	1.29	1.39	1.48	1.58	1.67	600	0.00	0.01	0.02	0.03	0.04	0.05	0.07	0.08	0.09	0.10
800	0.60	0.73	0.86	0.99	1.12	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.12	800	0.00	0.01	0.03	0.04	0.06	0.07	0.09	0.10	0.12	0.13
1000	0.69	0.85	1.01	1.17	1.33	1.48	1.64	1.79	1.95	2.10	2.25	2.40	2.55	1000	0.00	0.02	0.04	0.05	0.07	0.09	0.11	0.13	0.15	0.16
1200	0.78	0.97	1.15	1.34	1.52	1.71	1.89	2.07	2.25	2.42	2.60	2.77	2.95	1200	0.00	0.02	0.04	0.07	0.09	0.11	0.13	0.15	0.18	0.20
1400	0.85	1.07	1.28	1.50	1.71	1.92	2.12	2.33	2.53	2.73	2.93	3.13	3.33	1400	0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23
1600	0.92	1.17	1.41	1.64	1.88	2.11	2.34	2.57	2.80	3.02	3.25	3.47	3.69	1600	0.00	0.03	0.06	0.09	0.12	0.15	0.18	0.20	0.23	0.26
1800	0.99	1.25	1.52	1.78	2.04	2.30	2.55	2.81	3.05	3.30	3.55	3.79	4.03	1800	0.00	0.03	0.07	0.10	0.13	0.16	0.20	0.23	0.26	0.30
2000	1.04	1.34	1.62	1.91	2.19	2.47	2.75	3.03	3.30	3.57	3.83	4.09	4.35	2000	0.00	0.04	0.07	0.11	0.15	0.18	0.22	0.26	0.29	0.33
2200	1.09	1.41	1.72	2.03	2.34	2.64	2.94	3.23	3.53	3.81	4.10	4.38	4.66	2200	0.00	0.04	0.08	0.12	0.16	0.20	0.24	0.28	0.32	0.36
2400	1.14	1.48	1.81	2.15	2.47	2.80	3.12	3.43	3.74	4.05	4.35	4.65	4.95	2400	0.00	0.04	0.09	0.13	0.18	0.22	0.26	0.31	0.35	0.39
2600	1.18	1.54	1.90	2.25	2.60	2.94	3.28	3.62	3.95	4.27	4.59	4.91	5.22	2600	0.00	0.05	0.09	0.14	0.19	0.24	0.29	0.33	0.38	0.43
2800	1.21	1.59	1.98	2.35	2.72	3.08	3.44	3.79	4.14	4.48	4.81	5.14	5.47	2800	0.00	0.05	0.10	0.15	0.20	0.26	0.31	0.36	0.41	0.46
3000	1.24	1.64	2.05	2.44	2.83	3.21	3.59	3.95	4.32	4.67	5.02	5.36	5.70	3000	0.00	0.05	0.11	0.16	0.22	0.27	0.33	0.38	0.44	0.49
3200	1.26	1.69	2.11	2.52	2.93	3.33	3.72	4.11	4.48	4.85	5.21	5.57	5.91	3200	0.00	0.06	0.12	0.18	0.23	0.29	0.35	0.41	0.47	0.53
3400	1.28	1.73	2.17	2.60	3.02	3.44	3.85	4.25	4.64	5.02	5.39	5.75	6.11	3400	0.00	0.06	0.12	0.19	0.25	0.31	0.37	0.44	0.50	0.56
3600	1.29	1.76	2.22	2.67	3.11	3.54	3.96	4.37	4.77	5.17	5.55	5.92	6.28	3600	0.00	0.07	0.13	0.20	0.26	0.33	0.39	0.46	0.53	0.59
3800	1.30	1.79	2.26	2.73	3.19	3.63	4.06	4.49	4.90	5.30	5.69	6.07	6.43	3800	0.00	0.07	0.14	0.21	0.28	0.35	0.42	0.49	0.56	0.63
4000	1.30	1.81	2.30	2.78	3.25	3.71	4.16	4.59	5.01	5.42	5.81	6.19	6.56	4000	0.00	0.07	0.15	0.22	0.29	0.37	0.44	0.51	0.59	0.66
4200	1.30	1.83	2.33	2.83	3.31	3.78	4.24	4.68	5.11	5.52	5.92	6.30	6.67	4200	0.00	0.08	0.15	0.23	0.31	0.38	0.46	0.54	0.61	0.69
4400	1.30	1.84	2.36	2.87	3.36	3.84	4.31	4.76	5.19	5.61	6.01	6.39	6.75	4400	0.00	0.08	0.16	0.24	0.32	0.40	0.48	0.56	0.64	0.72
4600	1.29	1.84	2.38	2.90	3.41	3.89	4.37	4.82	5.26	5.68	6.07	6.45		4600	0.00	0.08	0.17	0.25	0.34	0.42	0.50	0.59	0.67	0.76
4800	1.27	1.84	2.39	2.92	3.44	3.94	4.41	4.87	5.31	5.73	6.12			4800	0.00	0.09	0.18	0.26	0.35	0.44	0.53	0.61	0.70	0.79
5000	1.25	1.83	2.40	2.94	3.46	3.97	4.45	4.91	5.35	5.76				5000	0.00	0.09	0.18	0.27	0.37	0.46	0.55	0.64	0.73	0.82
5200	1.23	1.82	2.39	2.95	3.48	3.98	4.47	4.93	5.37	5.78				5200	0.00	0.10	0.19	0.29	0.38	0.48	0.57	0.67	0.76	0.86
5400	1.19	1.80	2.38	2.94	3.48	3.99	4.48	4.94	5.37					5400	0.00	0.10	0.20	0.30	0.39	0.49	0.59	0.69	0.79	0.89
5600	1.16	1.78	2.37	2.93	3.47	3.99	4.47	4.93						5600	0.00	0.10	0.20	0.31	0.41	0.51	0.61	0.72	0.82	0.92
5800	1.12	1.74	2.34	2.92	3.46	3.97	4.46							5800	0.00	0.11	0.21	0.32	0.42	0.53	0.64	0.74	0.85	0.95
6000	1.07	1.71	2.31	2.89	3.43	3.95	4.42							6000	0.00	0.11	0.22	0.33	0.44	0.55	0.66	0.77	0.88	0.99
6200	1.02	1.66	2.27	2.85	3.40	3.91								6200	0.00	0.11	0.23	0.34	0.45	0.57	0.68	0.79	0.91	1.02
6400	0.96	1.61	2.23	2.81	3.35									6400	0.00	0.12	0.23	0.35	0.47	0.59	0.70	0.82	0.94	1.05
6600	0.90	1.56	2.17	2.75	3.29									6600	0.00	0.12	0.24	0.36	0.48	0.60	0.72	0.84	0.97	1.09
6800	0.83	1.49	2.11	2.69										6800	0.00	0.12	0.25	0.37	0.50	0.62	0.75	0.87	1.00	1.12
7000	0.76	1.42	2.04	2.62										7000	0.00	0.13	0.26	0.38	0.51	0.64	0.77	0.90	1.02	1.15
7200	0.68	1.34	1.96											7200	0.00	0.13	0.26	0.40	0.53	0.66	0.79	0.92	1.05	1.18
7400	0.59	1.26	1.88											7400	0.00	0.14	0.27	0.41	0.54	0.68	0.81	0.95	1.08	1.22
7600	0.50	1.17	1.78											7600	0.00	0.14	0.28	0.42	0.56	0.70	0.83	0.97	1.11	1.25
7800	0.41	1.07												7800	0.00	0.14	0.28	0.43	0.57	0.71	0.86	1.00	1.14	1.28
8000	0.30	0.96												8000	0.00	0.15	0.29	0.44	0.58	0.73	0.88	1.02	1.17	1.32

Table 10. Basic Horsepower Ratings("B" Section)

Unit : HP

RPM of Faster Shaft	Rated HP per belt for small pulley pitch diameter																		RPM of Faster Shaft	Additional HP per belt for speed ratio									
	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200		1.00 ~1.01	1.02 ~1.04	1.05 ~1.07	1.08 ~1.10	1.11 ~1.14	1.15 ~1.20	1.21 ~1.27	1.28 ~1.39	1.40 ~1.64	1.65 & over
870	2.29	2.52	2.76	2.99	3.22	3.45	3.68	3.91	4.13	4.36	4.58	4.81	5.03	5.25	5.47	5.69	5.90	6.12	870	0.00	0.02	0.04	0.06	0.09	0.11	0.13	0.15	0.17	0.19
1160	2.79	3.09	3.39	3.69	3.98	4.27	4.56	4.85	5.14	5.43	5.71	5.99	6.27	6.55	6.82	7.10	7.37	7.64	1160	0.00	0.03	0.06	0.09	0.11	0.14	0.17	0.20	0.23	0.26
1750	3.61	4.03	4.44	4.85	5.26	5.66	6.06	6.46	6.85	7.23	7.62	7.99	8.37	8.74	9.10	9.47	9.82	10.18	1750	0.00	0.04	0.09	0.13	0.17	0.22	0.26	0.30	0.35	0.39
200	0.74	0.81	0.87	0.93	1.00	1.06	1.12	1.18	1.25	1.31	1.37	1.43	1.49	1.55	1.61	1.68	1.74	1.80	200	0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04
400	1.28	1.40	1.52	1.64	1.75	1.87	1.99	2.10	2.22	2.33	2.45	2.56	2.68	2.79	2.90	3.02	3.13	3.24	400	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
600	1.74	1.92	2.08	2.25	2.42	2.59	2.75	2.92	3.08	3.25	3.41	3.57	3.74	3.90	4.06	4.22	4.38	4.54	600	0.00	0.01	0.03	0.04	0.06	0.07	0.09	0.10	0.12	0.13
800	2.15	2.37	2.59	2.81	3.02	3.24	3.45	3.66	3.87	4.08	4.29	4.50	4.71	4.91	5.12	5.32	5.52	5.73	800	0.00	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18
1000	2.52	2.79	3.05	3.31	3.57	3.83	4.09	4.35	4.60	4.85	5.10	5.35	5.60	5.85	6.10	6.34	6.58	6.83	1000	0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22
1200	2.85	3.16	3.47	3.78	4.08	4.38	4.68	4.98	5.27	5.56	5.85	6.14	6.43	6.72	7.00	7.28	7.56	7.84	1200	0.00	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27
1400	3.15	3.51	3.85	4.20	4.54	4.88	5.22	5.56	5.89	6.22	6.55	6.87	7.19	7.51	7.83	8.14	8.46	8.76	1400	0.00	0.03	0.07	0.10	0.14	0.17	0.21	0.24	0.28	0.31
1600	3.42	3.81	4.20	4.59	4.97	5.34	5.72	6.09	6.46	6.82	7.18	7.54	7.89	8.24	8.59	8.93	9.27	9.60	1600	0.00	0.04	0.08	0.12	0.16	0.20	0.24	0.28	0.32	0.36
1800	3.66	4.09	4.52	4.94	5.35	5.76	6.17	6.57	6.97	7.37	7.75	8.14	8.52	8.90	9.27	9.64	10.00	10.36	1800	0.00	0.04	0.09	0.13	0.18	0.22	0.27	0.31	0.36	0.40
2000	3.88	4.34	4.80	5.25	5.70	6.14	6.58	7.01	7.44	7.86	8.27	8.68	9.08	9.48	9.87	10.26	10.64	11.01	2000	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45
2200	4.06	4.56	5.05	5.53	6.01	6.48	6.94	7.40	7.85	8.29	8.73	9.15	9.58	9.99	10.40	10.80	11.19	11.58	2200	0.00	0.05	0.11	0.16	0.22	0.27	0.33	0.38	0.44	0.49
2400	4.22	4.74	5.26	5.77	6.27	6.77	7.25	7.73	8.20	8.66	9.12	9.56	10.00	10.42	10.84	11.25	11.65	12.03	2400	0.00	0.06	0.12	0.18	0.24	0.30	0.36	0.42	0.48	0.54
2600	4.34	4.90	5.44	5.98	6.50	7.02	7.52	8.02	8.50	8.98	9.44	9.90	10.34	10.77	11.19	11.60	12.00	12.39	2600	0.00	0.06	0.13	0.19	0.26	0.32	0.39	0.45	0.52	0.58
2800	4.44	5.02	5.59	6.14	6.69	7.22	7.74	8.25	8.74	9.23	9.70	10.16	10.60	11.03	11.45	11.86	12.25	12.62	2800	0.00	0.07	0.14	0.21	0.28	0.35	0.42	0.49	0.56	0.62
3000	4.51	5.11	5.70	6.27	6.83	7.37	7.90	8.42	8.92	9.41	9.88	10.34	10.78	11.21	11.62	12.01			3000	0.00	0.07	0.15	0.22	0.30	0.37	0.45	0.52	0.60	0.67
3200	4.55	5.17	5.77	6.35	6.92	7.48	8.02	8.54	9.04	9.53	9.99	10.44	10.88						3200	0.00	0.08	0.16	0.24	0.32	0.40	0.48	0.56	0.63	0.71
3400	4.56	5.19	5.80	6.40	6.98	7.53	8.07	8.59	9.09	9.57	10.03								3400	0.00	0.08	0.17	0.25	0.34	0.42	0.51	0.59	0.67	0.76
3600	4.53	5.18	5.80	6.40	6.98	7.54	8.07	8.58	9.07										3600	0.00	0.09	0.18	0.27	0.36	0.45	0.54	0.62	0.71	0.80
3800	4.48	5.13	5.75	6.36	6.93	7.49	8.01	8.51											3800	0.00	0.09	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85
4000	4.39	5.04	5.67	6.27	6.84	7.38													4000	0.00	0.10	0.20	0.30	0.40	0.50	0.59	0.69	0.79	0.89
4200	4.26	4.91	5.54	6.13	6.69														4200	0.00	0.10	0.21	0.31	0.42	0.52	0.62	0.73	0.83	0.94
4400	4.10	4.75	5.36	5.94															4400	0.00	0.11	0.22	0.33	0.44	0.55	0.65	0.76	0.87	0.98
4600	3.90	4.54																	4600	0.00	0.11	0.23	0.34	0.46	0.57	0.68	0.80	0.91	1.03
4800	3.67																		4800	0.00	0.12	0.24	0.36	0.48	0.59	0.71	0.83	0.95	1.07

For speeds over 30m/s we recommend that pulleys be dynamically balanced.

Table 11. Basic Horsepower Ratings("C" Section)

Unit : HP

RPM of Faster Shaft	Rated HP per belt for small pulley pitch diameter													RPM of Faster Shaft	Additional HP per belt for speed ratio									
	175	190	200	215	230	240	250	265	280	290	305	315	330		1.00 ~1.01	1.02 ~1.04	1.05 ~1.07	1.08 ~1.10	1.11 ~1.14	1.15 ~1.20	1.21 ~1.27	1.28 ~1.39	1.40 ~1.64	1.65 & over
870	6.09	7.33	8.15	9.36	10.55	11.33	12.11	13.26	14.39	15.14	16.24	16.97	18.04	870	0.00	0.12	0.23	0.35	0.46	0.58	0.70	0.81	0.93	1.05
1160	7.31	8.86	9.88	11.39	12.86	13.83	14.78	16.18	17.55	18.45	19.77	20.63	21.89	1160	0.00	0.16	0.31	0.47	0.62	0.78	0.93	1.08	1.24	1.39
1750	8.97	11.03	12.36	14.30	16.15	17.35	18.51	20.18	21.76	22.77	24.20	25.11	26.38	1750	0.00	0.23	0.47	0.70	0.93	1.17	1.40	1.64	1.87	2.10
100	1.16	1.34	1.47	1.65	1.83	1.95	2.07	2.25	2.43	2.54	2.72	2.84	3.01	100	0.00	0.01	0.03	0.04	0.05	0.07	0.08	0.09	0.11	0.12
200	2.03	2.38	2.61	2.95	3.28	3.51	3.73	4.06	4.39	4.61	4.93	5.15	5.47	200	0.00	0.03	0.05	0.08	0.11	0.13	0.16	0.19	0.21	0.24
300	2.80	3.29	3.62	4.11	4.59	4.91	5.23	5.70	6.17	6.48	6.95	7.26	7.72	300	0.00	0.04	0.08	0.12	0.16	0.20	0.24	0.28	0.32	0.36
400	3.49	4.12	4.55	5.17	5.79	6.20	6.61	7.22	7.83	8.23	8.82	9.22	9.81	400	0.00	0.05	0.11	0.16	0.21	0.27	0.32	0.37	0.43	0.48
500	4.12	4.90	5.41	6.17	6.92	7.42	7.91	8.65	9.38	9.86	10.58	11.06	11.77	500	0.00	0.07	0.13	0.20	0.27	0.33	0.40	0.47	0.53	0.60
600	4.71	5.61	6.21	7.10	7.98	8.56	9.14	10.00	10.84	11.41	12.24	12.79	13.61	600	0.00	0.08	0.16	0.24	0.32	0.40	0.48	0.56	0.64	0.72
700	5.25	6.29	6.97	7.98	8.98	9.64	10.29	11.26	12.23	12.86	13.80	14.42	15.35	700	0.00	0.09	0.19	0.28	0.37	0.47	0.56	0.65	0.75	0.84
800	5.76	6.91	7.68	8.81	9.92	10.65	11.38	12.46	13.53	14.23	15.27	15.95	16.97	800	0.00	0.11	0.21	0.32	0.43	0.53	0.64	0.75	0.86	0.96
900	6.23	7.50	8.34	9.58	10.81	11.61	12.41	13.59	14.75	15.51	16.64	17.39	18.49	900	0.00	0.12	0.24	0.36	0.48	0.60	0.72	0.84	0.96	1.08
1000	6.67	8.06	8.97	10.31	11.64	12.51	13.37	14.64	15.89	16.71	17.92	18.72	19.89	1000	0.00	0.13	0.27	0.40	0.53	0.67	0.80	0.94	1.07	1.20
1100	7.08	8.57	9.55	11.00	12.42	13.35	14.27	15.63	16.95	17.82	19.10	19.94	21.17	1100	0.00	0.15	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32
1200	7.45	9.05	10.10	11.64	13.15	14.13	15.11	16.54	17.94	18.85	20.19	21.06	22.34	1200	0.00	0.16	0.32	0.48	0.64	0.80	0.96	1.12	1.28	1.44
1300	7.80	9.49	10.60	12.23	13.82	14.86	15.88	17.38	18.83	19.78	21.17	22.07	23.38	1300	0.00	0.17	0.35	0.52	0.69	0.87	1.04	1.22	1.39	1.56
1400	8.11	9.90	11.06	12.77	14.44	15.52	16.58	18.14	19.64	20.62	22.04	22.96	24.29	1400	0.00	0.19	0.37	0.56	0.75	0.94	1.12	1.31	1.50	1.68
1500	8.40	10.27	11.49	13.27	15.00	16.12	17.22	18.82	20.37	21.36	22.81	23.73	25.07	1500	0.00	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60	1.80
1600	8.65	10.60	11.87	13.72	15.51	16.66	17.79	19.43	21.00	22.00	23.46	24.38	25.71	1600	0.00	0.21	0.43	0.64	0.85	1.07	1.28	1.50	1.71	1.92
1700	8.87	10.89	12.21	14.12	15.95	17.14	18.29	19.95	21.53	22.54	23.98	24.90	26.20	1700	0.00	0.23	0.45	0.68	0.91	1.14	1.36	1.59	1.82	2.04
1800	9.06	11.15	12.50	14.46	16.34	17.54	18.71	20.39	21.97	22.97	24.39	25.28		1800	0.00	0.24	0.48	0.72	0.96	1.20	1.44	1.68	1.92	2.16
1900	9.22	11.37	12.76	14.76	16.67	17.88	19.06	20.73	22.30	23.28				1900	0.00	0.25	0.51	0.76	1.01	1.27	1.52	1.78	2.03	2.28
2000	9.34	11.55	12.96	15.00	16.93	18.15	19.33	20.99	22.53					2000	0.00	0.27	0.53	0.80	1.07	1.34	1.60	1.87	2.14	2.40
2100	9.43	11.69	13.13	15.19	17.12	18.35	19.51	21.15						2100	0.00	0.28	0.56	0.84	1.12	1.40	1.68	1.96	2.25	2.52
2200	9.49	11.78	13.24	15.31	17.25	18.47	19.61							2200	0.00	0.29	0.59	0.88	1.18	1.47	1.76	2.06	2.35	2.64
2300	9.52	11.84	13.31	15.39	17.31	18.51								2300	0.00	0.31	0.61	0.92	1.23	1.54	1.84	2.15	2.46	2.76
2400	9.50	11.85	13.32	15.40	17.30									2400	0.00	0.32	0.64	0.96	1.28	1.60	1.92	2.24	2.57	2.88
2500	9.46	11.82	13.29	15.35										2500	0.00	0.33	0.67	1.00	1.34	1.67	2.00	2.34	2.67	3.01
2600	9.37	11.74	13.20	15.24										2600	0.00	0.35	0.69	1.04	1.39	1.74	2.08	2.43	2.78	3.13
2700	9.25	11.61	13.06											2700	0.00	0.36	0.72	1.08	1.44	1.80	2.16	2.53	2.89	3.25
2800	9.09	11.44	12.87											2800	0.00	0.37	0.75	1.12	1.50	1.87	2.24	2.62	2.99	3.37
2900	8.89	11.21												2900	0.00	0.39	0.77	1.16	1.55	1.94	2.32	2.71	3.10	3.49
3000	8.65	10.94												3000	0.00	0.40	0.80	1.20	1.60	2.00	2.40	2.81	3.21	3.61
3100	8.37													3100	0.00	0.41	0.83	1.24	1.66	2.07	2.48	2.90	3.31	3.73
3200	8.04													3200	0.00	0.43	0.85	1.28	1.71	2.14	2.56	2.99	3.42	3.85

Narrow Multiple V-Belts

(3V, 5V, 8V)

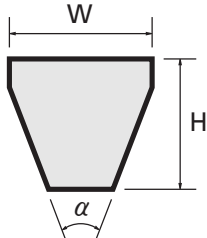
Scope

This manual covers V-belt drives used primarily for power transmission in industrial applications. One or more V-belts may be used on a drive, as required, to transmit the horsepower load. In general, the drives are in the integral-horsepower class as distinguished from light duty or fractional horsepower drives. This manual covers three V-belt cross sections and pulley groove sizes designated 3V, 5V and 8V. Dimensions of V-belts and pulleys together with basic design data are covered in this manual. This manual does not apply to automotive, agricultural drives.

Cross sections of V-belt

Nominal dimensions of three cross sections are given in **Table 1**.

Table 1. Nominal dimensions of V-belt cross sections in mm

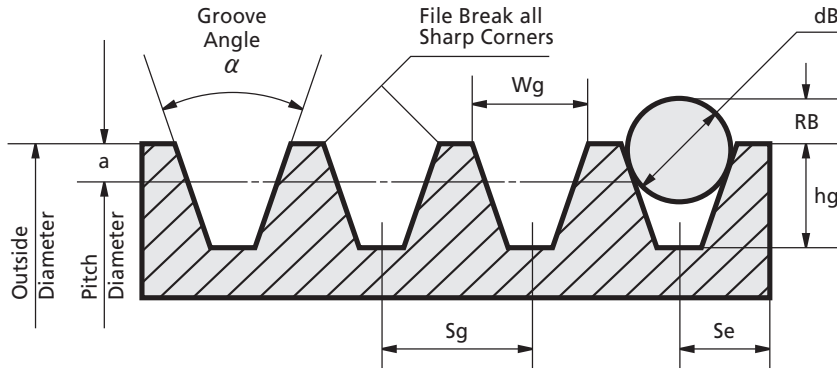
Cross Section	W	H	α	Features
3V	9.5	8.0	40°	
5V	16.0	13.5	40°	
8V	25.4	22.2	40°	

Nomenclature : $\frac{3V}{750}$
 ——— 10 times of effective length in inch
 ——— Cross Section

V-belt Pulleys

Groove angles and dimensions for pulleys shall conform to **Figure 1** and **Table 2**.

Figure 1. Standard Groove Dimensions



Face width of standard and deep groove pulleys

$$\text{Face width} = Sg(Ng - 1) + 2Se$$

Where : Ng = Number of grooves

Table 2. Standard Groove Dimensions in mm

Cross Section	Outside diameter range	α Groove angle ± 0.25 Degrees	W_0 ± 0.13	hg Min.	2a	RB Min.	dB	Sg ± 0.4	Se
3V	Up through 90	36	8.89	8.6	1.2	4.09	8.50 ± 0.01	10.3	9^{+2}_{-1}
	Over 90 to and Incl. 150	38							
	Over 150 to and Incl. 305	40							
	Over 305	42							
5V	Up through 235	38	15.24	15.0	2.6	8.16	15.00 ± 0.02	17.5	13^{+3}_{-1}
	Over 255 to and Incl. 405	40							
	Over 405	42							
8V	Up through 405	38	25.40	25.1	5.0	13.76	25.00 ± 0.02	28.6	19^{+6}_{-2}
	Over 405 to and Incl. 570	40							
	Over 570	42							

Measurement of Length

The effective outside length of a V-belt shall be determined by placing the belt on a measuring fixture comprising. Two pulleys of equal diameter, a method of applying force, and a means of measuring the center distance between the two pulleys. One of the two pulleys is fixed in position while the other is movable along a graduated scale. The fixture is shown schematically in **Figure 2**. Specifications for diameter and groove dimensions(including tolerances) of the measuring pulleys are given in **Table 3**, along with the measuring forces.

In measuring the length of a belt, the belt shall be rotated around the pulleys at least two revolutions of the belt to seat the belt properly in the pulley grooves, to divide equally the total force between the two strands of the belt, and to determine the midpoint of the center distance travel of the movable pulley, which shall define the center distance.

The effective outside length shall be calculated by adding the effective outside circumference of one of the measuring pulleys to twice the measured center distance between the two pulleys.

$$EOC = 2C + \pi d_e$$

Where EOC : Effective outside circumference of belt
 C : Center distance of measuring pulleys
 d_e : Outside diameter of pulley

Figure 2. Diagram of a Fixture for Measuring V-belts.

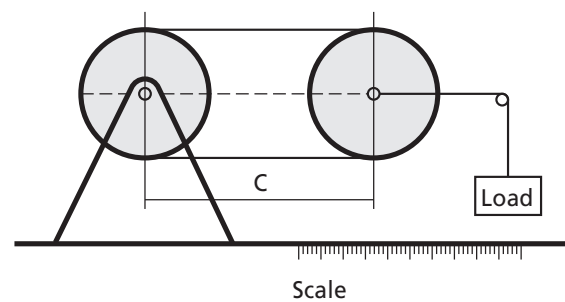
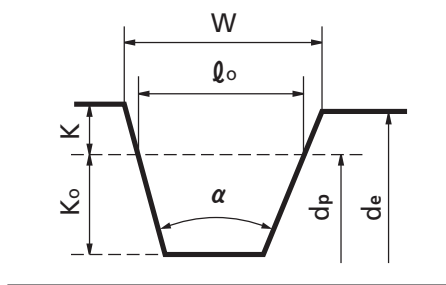


Table 3. Dimensions of Pulleys for measuring V-belts in mm

Cross Section	l_o	$W \pm 0.03$	K	K_o	d_p	$d_e \pm 0.01$	$\alpha (^{\circ}) \pm 0.2$	πd_e	Load (kg)
3V	8.5	8.90	0.6	8.4	95.88	97.08	38	305	45
5V	14.3	15.20	1.3	13.7	199.53	202.13	38	635	100
8V	23.7	25.40	2.5	22.5	399.25	404.25	38	1,270	225



Design Factor

Service Factors

The selection of a V-belt drive for any application should be based on the nature of the load and the type of driving unit. Service Factors for different kinds of driven machines combined with different types of driving units are shown in **Table 4**. The driven machine are representative samples only. Select a driven machine whose load characteristics most closely approximate those of the machine being considered.

Table 4. Suggested Service Factors for V-belt Drives

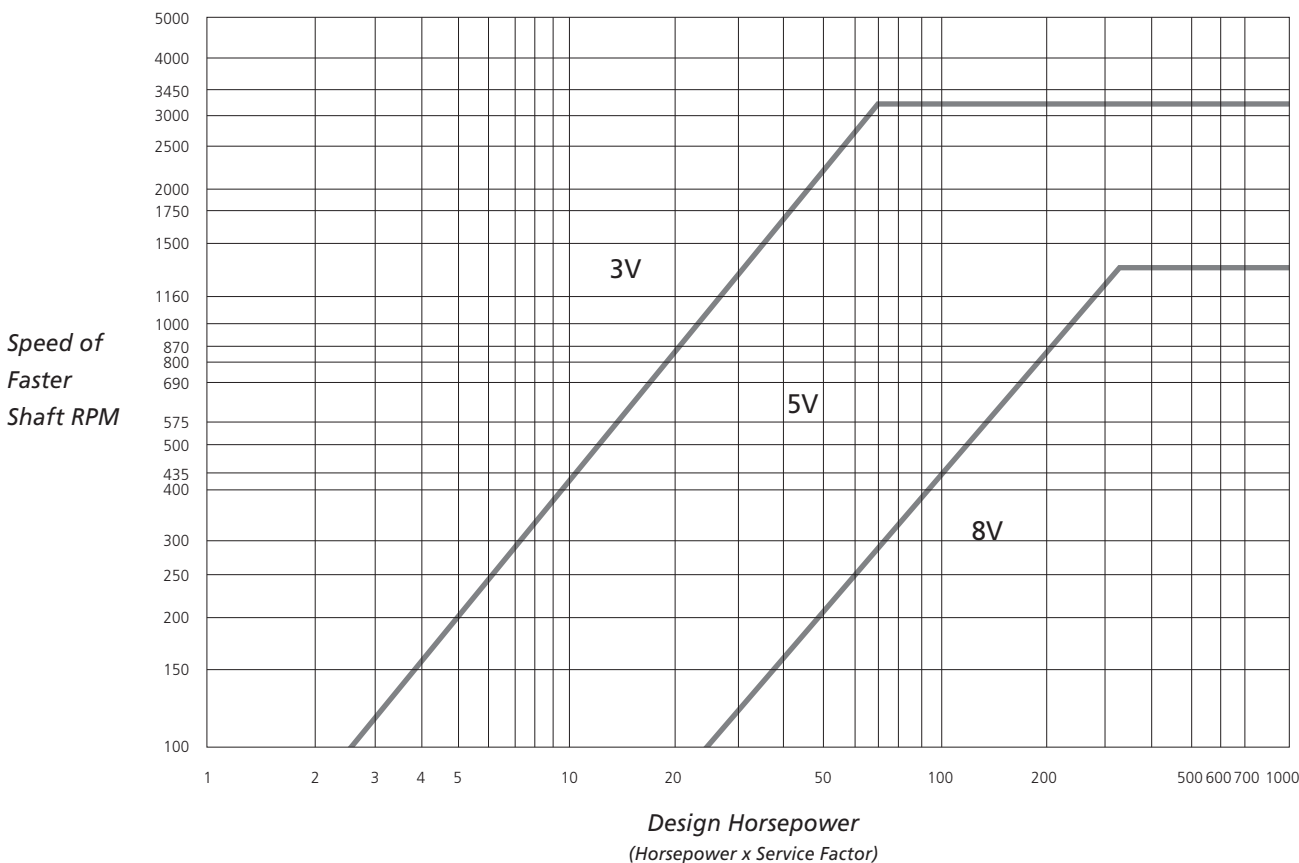
Type of Driven Machine	Types of Driving Units					
	AC Motors : Normal Torque, Squirrel Cage, Synchronous and Split Phase. DC Motors : Shunt Wound, Multiple Cylinder Internal Combustion Engines.			AC Motors : High Torque, High Slip, Repulsion-Induction, Single Phase Series Wound and Slip Ring. DC Motors : Series Wound and Compound Wound, Single Cylinder Internal Combustion Engines, Line Shafts, Clutches.		
	Intermittent Service(3-5 Hours Daily of Seasonal)	Normal Service(8-10 Hours Daily)	Continuous Service(16-24 Hours Daily)	Intermittent Service(3-5 Hours Daily of Seasonal)	Normal Service(8-10 Hours Daily)	Continuous Service(16-24 Hours Daily)
Agitators for Liquids Blowers and Exhausters Centrifugal Pumps and Compressors Fans up to 10 HP Light Duty Conveyors	1.0	1.1	1.2	1.1	1.2	1.3
Belt Conveyors for Sand, Grain, etc. Dough Mixers Fans Over 10 HP Generators Line Shafts Laundry Machinery Machine Tools Punches-Presses-Shears Printing Machinery Positive Displacement Rotary Pumps Revolving and Vibrating Screens	1.1	1.2	1.3	1.2	1.3	1.4
Brick Machinery Bucket Elevators Exciters Piston Compressors Conveyors(Drag-Pan-Screw) Hammer Mills Paper Mill Beaters Piston Pumps Positive Displacement Blowers Pulverizers Saw Mill and Woodworking Textile Machinery	1.2	1.3	1.4	1.4	1.5	1.6
Crushers(Gyratory-Jaw-Roll) Mills(Ball-Rod-Tube) Hoists Rubber Calenders-Extruders-Mills	1.3	1.4	1.5	1.5	1.6	1.8

Note : The use of a service factor of 2.0 is recommended for equipment subject to choking.

Cross Section Selection

Use the chart(Figure 3) as a guide to the V-belt cross section to use for any combination of design horsepower and speed of faster shaft. When the intersection of the design horsepower and speed of faster shaft falls near a line between two areas on the chart, it is always desirable to investigate the possibilities in both areas. Special circumstances.

Figure 3. Selection of V-belt Cross Section



Horsepower Ratings

The horsepower ratings recommended for standard belts of average length and with 180 degree arc of contact are shown in Tables 9 through 11.

Corrected Horsepower Rating for One Belt

The corrected horsepower rating of one belt is obtained by multiplying the horsepower rating from Tables 9 through 11 by the arc of contact correction factor and by the length correction factor.

Number of Belts

The number of belts required for an application is obtained by dividing the design horsepower by the corrected horsepower rating for one belt.

Arc of Contact Correction Factor

For arc of contact other than 180 degrees determine the arc of contact correction factor (F_{θ}) from Table 5.

Table 5. Arc of Contact Correction Factor (F_{θ})

$\frac{D_e - d_e}{C}$	Arc of contact on small pulley (Degrees)	Correction factor (F_{θ})
0.00	180	1.00
0.10	174	0.99
0.20	169	0.97
0.30	163	0.96
0.40	157	0.94
0.50	151	0.93
0.60	145	0.91
0.70	139	0.89
0.80	133	0.87
0.90	127	0.85
1.00	120	0.82
1.10	113	0.80
1.20	106	0.77
1.30	99	0.73
1.40	91	0.70
1.50	83	0.65

Arc of contact on the small pulley may be determined by the formulas.

$$\text{Arc of Contact(degree)} = 180 - \frac{60(D_e - d_e)}{C}$$

D_e : Effective outside diameter of large pulley in millimeters

d_e : Effective outside diameter of small pulley in millimeters

C : Center distance in millimeters

Length Correction Factor

For belts shorter or longer than average length determine the length correction factor(F_L) from **Table 6**.

Table 6. Length Correction Factors (F_L)

Std. Length Designation	Cross Section			Std. Length Designation	Cross Section		
	3V	5V	8V		3V	5V	8V
250	0.83			1400	1.15	1.02	0.92
265	0.84			1500		1.03	0.93
280	0.85			1600		1.04	0.94
300	0.86			1700		1.05	0.94
315	0.87			1800		1.06	0.95
335	0.88			1900		1.07	0.96
355	0.89			2000		1.08	0.97
375	0.90			2120		1.09	0.98
400	0.92			2240		1.09	0.98
425	0.93			2360		1.10	0.99
450	0.94			2500		1.11	1.00
475	0.95			2650		1.12	1.01
500	0.96	0.85		2800		1.13	1.02
530	0.97	0.86		3000		1.14	1.03
560	0.98	0.87		3150		1.15	1.03
600	0.99	0.88		3350		1.16	1.04
630	1.00	0.89		3550		1.17	1.05
670	1.01	0.90		3750			1.06
710	1.02	0.91		4000			1.07
750	1.03	0.92		4250			1.08
800	1.04	0.93		4500			1.09
850	1.06	0.94		4750			1.09
900	1.07	0.95		5000			1.10
950	1.08	0.96					
1000	1.09	0.96	0.87				
1060	1.10	0.97	0.88				
1120	1.11	0.98	0.88				
1180	1.12	0.99	0.89				
1250	1.13	1.00	0.90				
1320	1.14	1.01	0.91				

Minimum Pulley Diameter

The minimum pulley diameters recommended for standard V-belts are shown in **Table 7**.

Table 7. Minimum Pulley Diameter in mm

Cross Section	3V	5V	8V
Minimum diameter	67	180	315

Note : The smaller the pulley diameter, the less the belt life
Do not use the pulleys which are below the minimum recommended

Center Distance and Belt Length

The relation between center distance and length is given by the following formula :

$$EOC = 2C + 1.57(D_e + d_e) + \frac{(D_e - d_e)^2}{4C}$$

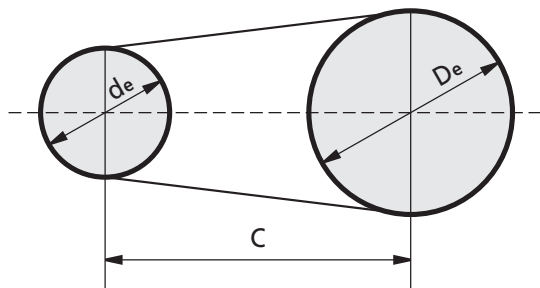
This formula can be solved for center distance instead of belt length as follows :

$$C = \frac{b + \sqrt{b^2 - 2(D_e - d_e)^2}}{4}$$

Where

- EOC : Effective outside circumference of belt(mm)
- C : Center distance(mm)
- D_e : Outside diameter of large pulley(mm)
- d_e : Outside diameter of small pulley(mm)
- b : $EOC - 1.57(D_e + d_e)$

Figure 4. Center Distance and Belt Length

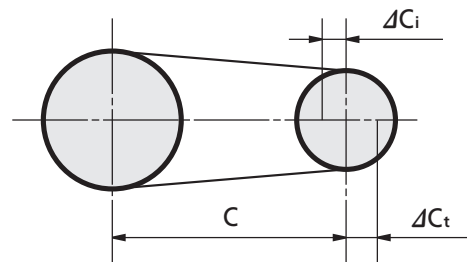


Installation and Take-up Allowances

After calculating a center distance from a standard length, make provision for adjusting the center distance as in **Table 8** to allow for damage-free installation of the belts, for tensioning, and for maintenance of proper tension throughout the life of the belt.

Table 8. Center Distance Allowance for Installation and Take-up in mm

Std. Length Designation	ΔC_i			ΔC_t
	3V	5V	8V	
Up to and Incl.475	15			25
Over 475 to and Incl.710	20	25		30
Over 710 to and Incl.1060	20	25	40	40
Over 1060 to and Incl.1250	20	25	40	45
Over 1250 to and Incl.1700	20	25	40	55
Over 1700 to and Incl.2000		25	45	65
Over 2000 to and Incl.2360		30	45	75
Over 2360 to and Incl.2650		30	45	80
Over 2650 to and Incl.3000		30	45	90
Over 3000 to and Incl.3550		30	50	100
Over 3550 to and Incl.3750			50	115
Over 3750 to and Incl.5000			50	140



Standard Length of V-belts

Available sizes shown in shadow areas

Std. Length Designation	Effective Outside Circumference (EOC)mm	Cross Section		
		3V	5V	8V
250	635			
265	673			
280	711			
300	762			
315	800			
335	851			
355	902			
375	953			
400	1016			
425	1080			
450	1143			
475	1207			
500	1270			
530	1346			
560	1422			
600	1524			
630	1600			
670	1702			
710	1803			
750	1905			
800	2032			
850	2159			
900	2286			
950	2413			
1000	2540			
1060	2692			
1120	2845			
1180	2997			
1250	3175			
1320	3353			
1400	3556			
1500	3810			
1600	4064			
1700	4318			
1800	4572			
1900	4826			
2000	5080			
2120	5385			
2240	5690			
2360	5994			

Std. Length Designation	Effective Outside Circumference (EOC)mm	Cross Section		
		3V	5V	8V
2500	6350			
2650	6731			
2800	7112			
3000	7620			
3150	8001			
3350	8509			
3550	9017			
3750	9525			
4000	10160			
4250	10795			
4500	11430			
4750	12065			
5000	12700			

Drive Design Example of Narrow Multiple V-Belts

Operation conditions

1. Motor : 50 HP.(37kw) Normal Torque 1000rpm
2. Machine : Generator 620 rpm
3. Center distance : abt. 1000mm
4. Operating hours : 16 hours per day

Step	Procedures	Results
1	Calculate the design horsepower $P_d = P_r \times F_s$ P_d : Design horsepower P_r : Rated horsepower F_s : Service factor(Table 4)	$P_d = 50 \times 1.3 = 65(\text{HP})$
2	Select the proper V-belt section (Figure 3)	Belt section : 5V
3	Select the pulley diameters ① Choose the minimum pulley diameter (Table 7) ② Find the speed ratio $\text{Speed ratio}(R_s) = \frac{n_1}{n_2}$ n_1 : Speed of small pulley(rpm) n_2 : Speed of large pulley(rpm) ③ Calculate the outside diameter of large pulley $D_e = R_s \times d_e$ D_e : Outside diameter of large pulley d_e : Outside diameter of small pulley	$d_e : 180(\text{mm})$ $R_s = \frac{1000}{620} = 1.6$ $D_e = 1.6 \times 180 = 288(\text{mm})$
4	① Determine the V-belt length(Figure 4) $\text{EOC} = 2C + 1.57(D_e + d_e) + \frac{(D_e - d_e)^2}{4C}$ EOC : Effective outside length C : Center distance ② Calculate the exact center distance of the pulleys after the belt length has been determined. $C = \frac{b + \sqrt{b^2 - 2(D_e - d_e)^2}}{4}$ $b : \text{EOC} - 1.57(D_e + d_e)$	$\text{EOC} = 2 \times 1000 + 1.57(288 + 180) + \frac{(288 - 180)^2}{4 \times 1000} = 2737(\text{mm})$ Select the nearest standard belt length $= 2692(5V1060 \text{ Belt})$ from Table on Pages 26 $b = 2692 - 1.57(288 + 180) = 1957$ $C = \frac{1957 + \sqrt{1957^2 - 2(288 - 180)^2}}{4} = 977(\text{mm})$
5	Determine the power per belt ① Identify the RPM of the faster shaft in the left hand column of Table 10. Now read across the same Table to the vertical column corresponding to the outside diameter of small pulley and find the basic horsepower. Using the same Table, read across from the RPM of the faster shaft to the vertical column corresponding to the speed ratio and find the additional horsepower. Add this value to the basic horsepower. Rated horsepower per belt(P_r) = BasicHP + Additional HP ② Determine the arc of contact correction factor(F_θ) from Table 5. ③ Determine the length correction factor(F_L) from Table 6.	$P_r = 11.45 + 1.14 = 12.59(\text{HP})$ $F_\theta = 0.99$ $F_L = 0.97$
6	Calculate the number of belts required where the number of belts $\text{Number of belts} = \frac{P_d}{P_r \times F_\theta \times F_L}$	$\text{Number of belts} = \frac{65}{12.59 \times 0.99 \times 0.97} = 5.37$
7	Determine the minimum center distance allowance (Table 8)	$\Delta C_i : 25\text{mm}, \Delta C_t : 40\text{mm}$
8	Summarize the V-belt drive design	(Summary) 1. Outside diameter of small pulley : 180mm 2. Outside diameter of large pulley : 288mm 3. Center distance : 977 mm 4. Belts to be used : 5V1060, 6pcs.

Table 9. Basic Horsepower Ratings("3V" Section)

Unit : HP

RPM of Faster Shaft	Rated HP per belt for small Sheave Outside diameter. mm																			RPM of Faster Shaft	Additional HP per belt for speed ratio										
	67	71	75	80	85	90	95	100	112	125	140	150	160	180	200	250	280	300	315		1.00 ~1.01	1.02 ~1.05	1.06 ~1.11	1.12 ~1.18	1.19 ~1.26	1.27 ~1.38	1.39 ~1.57	1.58 ~1.94	1.95 ~3.38	3.39 & over	
690	0.80	0.94	1.06	1.22	1.37	1.53	1.68	1.84	2.20	2.59	3.03	3.32	3.62	4.21	4.79	6.19	7.02	7.56	7.96	690	0.00	0.01	0.04	0.07	0.09	0.11	0.12	0.13	0.15	0.16	
725	0.84	0.98	1.10	1.27	1.43	1.60	1.76	1.92	2.29	2.71	3.18	3.49	3.79	4.40	5.00	6.47	7.33	7.90	8.32	725	0.00	0.01	0.04	0.07	0.09	0.11	0.13	0.15	0.16	0.17	
870	0.98	1.13	1.29	1.47	1.68	1.86	2.05	2.24	2.69	3.18	3.73	4.09	4.45	5.17	5.87	7.60	8.59	9.25	9.75	870	0.00	0.01	0.04	0.08	0.11	0.13	0.16	0.17	0.19	0.20	
950	1.05	1.22	1.38	1.60	1.80	2.01	2.21	2.41	2.91	3.43	4.02	4.42	4.81	5.59	6.34	8.19	9.28	9.97	10.50	950	0.00	0.01	0.05	0.09	0.12	0.15	0.17	0.19	0.21	0.23	
1160	1.22	1.43	1.64	1.88	2.13	2.37	2.63	2.87	3.46	4.09	4.80	5.27	5.72	6.65	7.55	9.72	10.97	11.77	12.36	1160	0.00	0.03	0.07	0.11	0.15	0.17	0.21	0.23	0.25	0.27	
1425	1.43	1.69	1.93	2.23	2.53	2.83	3.12	3.42	4.13	4.87	5.72	6.29	6.84	7.92	8.98	11.50	12.92	13.83	14.49	1425	0.00	0.03	0.08	0.13	0.17	0.21	0.25	0.28	0.31	0.34	
1750	1.69	1.97	2.27	2.63	2.99	3.35	3.71	4.06	4.91	5.79	6.80	7.47	8.11	9.38	10.60	13.46	15.03	15.99	16.69	1750	0.00	0.04	0.09	0.16	0.21	0.27	0.31	0.35	0.39	0.40	
2850	2.39	2.84	3.28	3.83	4.38	4.92	5.46	5.99	7.23	8.51	9.93	10.84	11.73	13.38	14.87	17.86	0.00	0.00	0.00	2850	0.00	0.05	0.15	0.27	0.36	0.44	0.51	0.58	0.63	0.67	
3450	2.69	3.23	3.75	4.40	5.03	5.66	6.26	6.86	8.28	9.71	11.27	12.24	13.16	14.81	16.22	0.00	0.00	0.00	0.00	3450	0.00	0.07	0.19	0.32	0.44	0.52	0.62	0.70	0.76	0.80	
100	0.16	0.17	0.20	0.23	0.25	0.28	0.31	0.32	0.39	0.46	0.52	0.58	0.62	0.72	0.82	1.06	0.00	0.00	1.30	1.37	100	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.03	0.03	0.03
200	0.28	0.32	0.36	0.42	0.47	0.51	0.56	0.62	0.72	0.86	0.99	1.09	1.18	1.37	1.55	2.01	2.28	2.47	2.60	200	0.00	0.00	0.01	0.01	0.03	0.03	0.04	0.04	0.04	0.04	
300	0.40	0.47	0.52	0.59	0.67	0.74	0.80	0.88	1.05	1.23	1.43	1.57	1.72	1.98	2.25	2.92	3.31	3.57	3.77	300	0.00	0.00	0.01	0.03	0.04	0.04	0.05	0.07	0.07	0.07	
400	0.51	0.59	0.67	0.76	0.86	0.95	1.05	1.14	1.35	1.60	1.86	2.04	2.23	2.57	2.92	3.81	4.30	4.64	4.89	400	0.00	0.01	0.03	0.04	0.05	0.07	0.07	0.08	0.09	0.09	
500	0.62	0.71	0.80	0.92	1.03	1.15	1.26	1.38	1.65	1.94	2.28	2.49	2.72	3.15	3.58	4.64	5.27	5.67	5.98	500	0.00	0.01	0.03	0.04	0.07	0.08	0.09	0.11	0.11	0.12	
600	0.72	0.83	0.94	1.07	1.22	1.35	1.49	1.62	1.94	2.29	2.68	2.94	3.20	3.71	4.22	5.47	6.19	6.69	7.04	600	0.00	0.01	0.03	0.05	0.08	0.09	0.11	0.12	0.13	0.13	
700	0.82	0.94	1.07	1.23	1.38	1.54	1.70	1.85	2.23	2.63	3.07	3.38	3.67	4.26	4.84	5.60	7.10	7.65	8.07	700	0.00	0.01	0.04	0.07	0.09	0.11	0.12	0.15	0.15	0.16	
800	0.91	1.06	1.19	1.38	1.55	1.73	1.90	2.08	2.51	2.95	3.46	3.79	4.13	4.80	5.46	7.05	7.99	8.61	9.06	800	0.00	0.01	0.04	0.08	0.11	0.12	0.15	0.16	0.17	0.19	
900	1.01	1.17	1.33	1.51	1.72	1.92	2.12	2.31	2.77	3.27	3.83	4.21	4.58	5.32	6.05	7.82	8.85	9.53	10.03	900	0.00	0.01	0.05	0.08	0.11	0.13	0.16	0.19	0.20	0.21	
1000	1.09	1.26	1.45	1.66	1.88	2.09	2.32	2.53	3.04	3.59	4.21	4.62	5.03	5.84	6.64	8.57	9.69	10.42	10.95	1000	0.00	0.01	0.05	0.09	0.12	0.15	0.17	0.20	0.21	0.23	
1100	1.18	1.37	1.55	1.80	2.04	2.28	2.51	2.75	3.30	3.90	4.58	5.03	5.47	6.34	7.21	9.29	10.50	11.27	11.85	1100	0.00	0.03	0.05	0.11	0.13	0.17	0.20	0.23	0.24	0.25	
1200	1.26	1.46	1.68	1.93	2.20	2.45	2.71	2.96	3.57	4.21	4.93	5.42	5.90	6.84	7.76	10.00	11.27	12.10	12.71	1200	0.00	0.03	0.07	0.11	0.15	0.19	0.21	0.24	0.27	0.28	
1300	1.34	1.57	1.78	2.06	2.35	2.61	2.90	3.16	3.81	4.50	5.29	5.80	6.31	7.33	8.31	10.68	11.92	12.90	13.53	1300	0.00	0.03	0.07	0.12	0.16	0.20	0.23	0.27	0.28	0.31	
1400	1.42	1.66	1.90	2.20	2.49	2.79	3.08	3.36	4.06	4.80	5.64	6.19	6.73	7.80	8.85	11.34	12.75	13.65	14.30	1400	0.00	0.03	0.08	0.13	0.17	0.21	0.25	0.28	0.31	0.32	
1500	1.50	1.76	2.01	2.32	2.64	2.95	3.26	3.58	4.30	5.09	5.98	6.55	7.13	8.27	9.37	11.97	13.43	14.37	15.04	1500	0.00	0.03	0.08	0.13	0.19	0.23	0.27	0.31	0.34	0.35	
1600	1.57	1.85	2.12	2.45	2.79	3.10	3.45	3.77	4.54	5.38	6.31	6.93	7.53	8.71	9.87	12.59	14.10	15.05	15.74	1600	0.00	0.03	0.08	0.15	0.20	0.24	0.28	0.32	0.35	0.38	
1700	1.65	1.93	2.23	2.57	2.92	3.27	3.62	3.97	4.79	5.66	6.64	7.28	7.92	9.16	10.36	13.18	14.72	15.70	16.38	1700	0.00	0.03	0.09	0.16	0.21	0.25	0.31	0.35	0.38	0.40	
1800	1.72	1.62	2.32	2.69	3.07	3.43	3.79	4.16	5.01	5.92	6.96	7.64	8.30	9.60	10.84	13.74	15.32	16.29	16.98	1800	0.00	0.04	0.09	0.16	0.23	0.28	0.32	0.36	0.40	0.42	
1900	1.78	2.10	2.43	2.82	3.20	3.59	3.97	4.34	5.24	6.21	7.28	7.98	8.67	10.01	11.30	14.28	15.87	16.85	17.53	1900	0.00	0.04	0.11	0.17	0.24	0.29	0.34	0.39	0.42	0.44	
2000	1.86	2.18	2.52	2.94	3.34	3.74	4.14	4.53	5.47	6.46	7.59	8.31	9.03	10.42	11.76	14.79	16.39	17.36	18.03	2000	0.00	0.04	0.11	0.19	0.25	0.31	0.36	0.40	0.44	0.47	
2100	1.93	2.28	2.61	3.04	3.47	3.89	4.30	4.72	5.70	6.73	7.90	8.65	9.38	10.82	12.18	15.27	16.88	17.83	18.47	2100	0.00	0.04	0.11	0.20	0.27	0.32	0.38	0.43	0.46	0.48	
2200	2.00	2.36	2.71	3.15	3.59	4.03	4.46	4.89	5.91	6.98	8.19	8.97	9.73	11.21	12.60	15.72	17.31	18.24	18.86	2200	0.00	0.04	0.12	0.20	0.28	0.34	0.39	0.44	0.48	0.51	
2300	2.05	2.43	2.80	3.27	3.73	4.18	4.62	5.07	6.13	7.23	8.47	9.28	10.07	11.57	13.00	16.14	17.71	18.61	19.20	2300	0.00	0.04	0.12	0.21	0.29	0.35	0.42	0.47	0.51	0.54	
2400	2.12	2.51	2.90	3.38	3.85	4.32	4.79	5.24	6.33	7.48	8.75	9.58	10.39	11.93	13.38	16.53	18.06	18.91	19.46	2400	0.00	0.04	0.13	0.23	0.31	0.36	0.43	0.48	0.52	0.56	
2500	2.18	2.59	2.99	3.49	3.97	4.46	4.95	5.42	6.54	7.72	9.03	9.88	10.70	12.28	13.74	16.89	18.36	19.17		2500	0.00	0.05	0.13	0.23	0.32	0.39	0.44	0.51	0.55	0.58	
2600	2.24	2.65	3.07	3.59	4.09	4.60	5.09	5.58	6.74	7.95	9.30	10.16	11.01	12.61	14.09	17.21	18.63			2600	0.00	0.05	0.13	0.24	0.34	0.40	0.47	0.52	0.58	0.60	
2700	2.31	2.73	3.16	3.69	4.21	4.73	5.24	5.75	6.93	8.18	9.56	10.44	11.30	12.92	14.41	17.49	18.85			2700	0.00	0.05	0.15	0.25	0.34	0.42	0.48	0.55	0.59	0.63	
2800	2.36	2.80	3.24	3.79	4.33	4.87	5.39	5.91	7.13	8.40	9.81	10.72	11.58	13.23	14.72	17.75				2800	0.00	0.05	0.15	0.25	0.35	0.43	0.50	0.56	0.62	0.66	
2900	2.41	2.87	3.32	3.89	4.44	4.99	5.54	6.06	7.32	8.62	10.05	10.98	11.86	13.51	15.01	17.96				2900	0.00	0.05	0.16	0.27	0.36	0.44	0.52	0.59	0.64	0.67	
3000	2.47	2.94	3.40	3.98	4.56	5.12	5.67	6.22	7.49	8.83	10.29	11.23	12.12	13.79	15.28	18.14				3000	0.00	0.05	0.16	0.28	0.38	0.46	0.54	0.60	0.66	0.70	
3100	2.52	3.00	3.49	4.08	4.66	5.24	5.80	6.37	7.68	9.03	10.52	11.47	12.37	14.05	15.52					3100	0.00	0.07	0.16	0.28	0.39	0.47	0.55	0.63	0.68	0.72	
3200	2.57	3.07	3.57	4.17	4.77	5.36	5.94	6.51	7.86	9.24	10.75	11.70	12.61	14.29	15.75					3200	0.00	0.07	0.17	0.29	0.40	0.50	0.58	0.64	0.70	0.75	
3300	2.63	3.14	3.65	4.26	4.88	5.48	6.07	6.66	8.02	9.44	10.97	11.93	12.84	14.52	15.95																

Table 10. Basic Horsepower Ratings("5V" Section)

Unit : HP

RPM of Faster Shaft	Rated HP per belt for small Sheave Outside diameter. mm																	RPM of Faster Shaft	Additional HP per belt for speed ratio										
	150	160	170	180	190	200	212	224	236	250	260	280	315	340	355	380	400		450	1.00 ~1.01	1.02 ~1.05	1.06 ~1.11	1.12 ~1.18	1.19 ~1.26	1.27 ~1.38	1.39 ~1.57	1.58 ~1.94	1.95 ~3.38	3.39 & over
575	5.00	5.72	6.46	7.18	7.91	8.63	9.49	10.34	11.19	12.17	12.99	14.26	16.66	18.35	19.36	21.01	22.32	25.55	575	0.00	0.07	0.17	0.32	0.42	0.50	0.59	0.68	0.71	0.76
690	5.80	6.68	7.53	8.39	9.25	10.09	11.11	12.10	13.11	14.26	15.08	16.70	19.50	21.47	22.64	25.90	26.07	29.79	690	0.00	0.08	0.21	0.36	0.50	0.60	0.70	0.79	0.86	0.91
725	6.06	6.96	7.86	8.75	9.65	10.54	11.58	12.64	13.67	14.88	15.74	17.43	20.35	22.40	23.61	25.60	27.17	31.02	725	0.00	0.08	0.21	0.38	0.52	0.63	0.74	0.83	0.90	0.95
870	7.02	8.10	9.16	10.20	11.25	12.29	13.53	14.76	15.97	17.37	18.36	20.34	23.71	26.07	27.47	29.73	31.53	35.83	870	0.00	0.09	0.27	0.46	0.62	0.75	0.88	0.99	1.09	1.15
950	7.53	8.70	9.84	10.98	12.10	13.23	14.56	15.88	17.18	18.71	19.77	21.88	25.48	28.00	29.48	31.89	33.77	38.28	950	0.00	0.11	0.28	0.50	0.68	0.82	0.97	1.09	1.18	1.25
1160	8.82	10.20	11.57	12.91	14.25	15.58	17.14	18.70	20.23	22.00	23.24	25.68	29.83	32.67	34.33	37.01	39.09	43.94	1160	0.00	0.13	0.35	0.60	0.83	1.01	1.18	1.33	1.45	1.53
1425	10.32	11.96	13.57	15.16	16.74	18.30	20.13	21.94	23.73	25.75	27.18	29.96	34.60	37.71	39.50	42.33	44.46	49.24	1425	0.00	0.16	0.43	0.75	1.02	1.23	1.45	1.62	1.77	1.88
1750	11.96	13.87	15.78	17.63	19.46	21.26	23.36	25.43	27.44	29.71	31.29	34.33	39.24	42.40	44.14	46.81	48.71		1750	0.00	0.19	0.52	0.92	1.25	1.51	1.78	2.00	2.17	2.31
2850	15.72	18.32	20.82	23.20	25.47	27.61	30.03	32.25	34.29	36.39	37.72								2850	0.00	0.32	0.86	1.50	2.04	2.47	2.90	3.26	3.55	3.75
50	0.60	0.67	0.75	0.83	0.90	0.98	1.06	1.15	1.25	1.34	1.42	1.57	1.82	2.00	2.10	2.28	2.43	2.77	50	0.00	0.00	0.01	0.03	0.04	0.05	0.05	0.07	0.07	0.07
60	0.71	0.79	0.88	0.98	1.06	1.15	1.26	1.37	1.46	1.60	1.68	1.85	2.14	2.36	2.49	2.71	2.87	3.30	60	0.00	0.00	0.01	0.03	0.04	0.05	0.07	0.07	0.08	0.08
70	0.80	0.91	1.02	1.11	1.22	1.33	1.45	1.57	1.69	1.82	1.93	2.13	2.48	2.72	2.87	3.11	3.31	3.79	70	0.00	0.01	0.03	0.04	0.05	0.07	0.08	0.08	0.09	0.09
80	0.91	1.03	1.14	1.26	1.38	1.49	1.64	1.77	1.90	2.06	2.18	2.41	2.80	3.08	3.24	3.53	3.74	4.29	80	0.00	0.01	0.03	0.04	0.05	0.07	0.08	0.09	0.09	0.11
90	1.01	1.14	1.27	1.41	1.53	1.66	1.81	1.97	2.12	2.31	2.43	2.68	3.12	3.43	3.62	3.93	4.17	4.79	90	0.00	0.01	0.03	0.05	0.07	0.08	0.09	0.11	0.11	0.12
100	1.11	1.25	1.39	1.54	1.69	1.82	2.00	2.17	2.33	2.53	2.67	2.95	3.43	3.78	3.98	4.33	4.60	5.28	100	0.00	0.01	0.03	0.05	0.07	0.08	0.11	0.12	0.12	0.13
150	1.58	1.80	2.00	2.21	2.43	2.63	2.88	3.13	3.38	3.66	3.86	4.28	4.97	5.48	5.78	6.27	6.68	7.65	150	0.00	0.01	0.04	0.08	0.11	0.13	0.15	0.17	0.19	0.20
200	2.02	2.31	2.59	2.86	3.12	3.40	3.73	4.05	4.37	4.75	5.01	5.55	6.47	7.12	7.52	8.16	8.67	9.96	200	0.00	0.03	0.05	0.11	0.15	0.17	0.20	0.23	0.25	0.27
250	2.47	2.80	3.14	3.47	3.81	4.14	4.54	4.95	5.35	5.80	6.13	6.78	7.92	8.73	9.21	10.00	10.63	12.20	250	0.00	0.03	0.08	0.13	0.17	0.21	0.25	0.28	0.31	0.34
300	2.88	3.28	3.69	4.09	4.48	4.88	5.35	5.82	6.29	6.84	7.23	8.00	9.34	10.28	10.86	11.80	12.53	14.38	300	0.00	0.03	0.09	0.16	0.21	0.25	0.31	0.35	0.38	0.40
350	3.28	3.75	4.21	4.68	5.13	5.59	6.14	6.68	7.23	7.84	8.30	9.18	10.72	11.82	12.47	13.55	14.41	16.53	350	0.00	0.04	0.11	0.19	0.25	0.31	0.36	0.40	0.43	0.46
400	3.67	4.21	4.73	5.25	5.76	6.29	6.90	7.52	8.12	8.83	9.34	10.35	12.09	13.31	14.05	15.27	16.23	18.62	400	0.00	0.04	0.12	0.21	0.28	0.35	0.40	0.46	0.50	0.52
450	4.06	4.65	5.24	5.82	6.39	6.97	7.65	8.34	9.02	9.81	10.38	11.49	13.42	14.79	15.60	16.94	18.02	20.66	450	0.00	0.05	0.13	0.24	0.32	0.39	0.46	0.51	0.56	0.59
500	4.44	5.09	5.74	6.37	7.01	7.64	8.40	9.16	9.89	10.76	11.38	12.61	14.73	16.23	17.12	18.59	19.77	22.65	500	0.00	0.05	0.15	0.27	0.36	0.43	0.51	0.58	0.62	0.66
550	4.81	5.52	6.22	6.92	7.48	8.30	9.13	9.95	10.76	11.70	12.39	13.71	16.02	17.65	18.62	20.21	21.47	24.60	550	0.00	0.07	0.16	0.29	0.39	0.48	0.56	0.63	0.68	0.72
600	5.17	5.94	6.70	7.45	8.20	8.95	9.84	10.72	11.61	12.63	13.36	14.80	17.29	19.03	20.08	21.80	23.15	26.49	600	0.00	0.07	0.17	0.32	0.43	0.52	0.60	0.68	0.75	0.79
650	5.54	6.35	7.17	7.98	8.79	9.60	10.55	11.50	12.45	13.54	14.32	15.87	18.53	20.40	21.51	23.35	24.80	28.34	650	0.00	0.07	0.20	0.34	0.47	0.56	0.66	0.74	0.80	0.86
700	5.88	6.76	7.63	8.50	9.36	10.21	11.25	12.27	13.27	14.44	15.27	16.92	19.75	21.74	22.92	24.85	26.39	30.13	700	0.00	0.08	0.21	0.36	0.50	0.60	0.71	0.80	0.87	0.92
750	6.22	7.16	8.08	9.01	9.93	10.84	11.93	13.00	14.08	15.32	16.19	17.95	20.94	23.04	24.29	26.34	27.95	31.88	750	0.00	0.08	0.23	0.39	0.54	0.64	0.76	0.86	0.94	0.99
800	6.55	7.55	8.54	9.52	10.48	11.45	12.60	13.74	14.88	16.18	17.12	18.95	22.12	24.33	25.63	27.77	29.46	33.57	800	0.00	0.09	0.24	0.42	0.58	0.70	0.82	0.91	0.99	1.06
850	6.89	7.94	8.98	10.01	11.03	12.05	13.27	14.46	15.66	17.04	18.02	19.95	23.26	25.58	26.94	29.18	30.94	35.20	850	0.00	0.09	0.25	0.44	0.60	0.74	0.86	0.97	1.06	1.13
900	7.21	8.32	9.41	10.50	11.57	12.64	13.91	15.17	16.43	17.88	18.90	20.92	24.38	26.80	28.23	30.55	32.37	36.78	900	0.00	0.09	0.27	0.46	0.64	0.78	0.91	1.03	1.13	1.19
950	7.53	8.70	9.84	10.98	12.10	13.23	14.56	15.88	17.18	18.70	19.77	21.88	25.48	28.00	29.48	31.89	33.77	38.28	950	0.00	0.11	0.28	0.50	0.68	0.82	0.97	1.09	1.18	1.25
1000	7.86	9.06	10.25	11.45	12.63	13.79	15.19	16.57	17.94	19.50	20.62	22.82	26.57	29.16	30.68	33.18	35.11	39.75	1000	0.00	0.11	0.29	0.52	0.72	0.87	1.02	1.14	1.25	1.31
1100	8.47	9.79	11.09	12.37	13.65	14.92	16.42	17.91	19.38	21.09	22.28	24.64	28.63	31.39	33.00	35.63	37.65	42.45	1100	0.00	0.12	0.34	0.58	0.79	0.95	1.11	1.26	1.37	1.45
1200	9.06	10.47	11.88	13.27	14.64	16.01	17.61	19.21	20.78	22.59	23.86	26.37	30.60	33.50	35.19	37.91	40.00	44.88	1200	0.00	0.13	0.36	0.63	0.86	1.05	1.22	1.37	1.49	1.58
1300	9.64	11.15	12.64	14.13	15.59	17.04	18.77	20.46	22.12	24.03	25.39	28.02	32.45	35.46	37.20	40.00	42.12	47.01	1300	0.00	0.15	0.39	0.68	0.92	1.13	1.31	1.49	1.62	1.72
1400	10.19	11.80	13.39	14.96	16.51	18.04	19.87	21.65	23.40	25.42	26.84	29.58	34.18	37.28	39.06	41.89	44.02	48.83	1400	0.00	0.16	0.42	0.74	1.01	1.22	1.42	1.60	1.74	1.85
1500	10.72	12.43	14.10	15.76	17.40	19.02	20.92	22.80	24.64	26.73	28.20	31.06	35.79	38.94	40.75	43.58	45.68	50.32	1500	0.00	0.16	0.46	0.79	1.07	1.30	1.53	1.72	1.80	1.98
1600	11.23	13.02	14.79	16.53	18.26	19.95	21.94	23.89	25.80	27.98	29.50	32.44	37.27	40.46	42.25	45.05	47.10	51.46	1600	0.00	0.17	0.48	0.86	1.14	1.38	1.62	1.82	2.00	2.10
1700	11.72	13.61	15.46	17.28	19.06	20.83	22.91	24.93	26.90	29.16	30.71	33.73	38.62	41.80	43.57	46.29	48.24	52.21	1700	0.00	0.02	0.51	0.90	1.22	1.47	1.73	1.94	2.12	2.24
1800	12.18	14.16	16.09	17.98	19.84	21.68	23.82	25.91	27.95	30.24	31.84	34.91	39.81	42.95	44.68	47.28	49.10		1800	0.00	0.20	0.54	0.95	1.29	1.55	1.82	2.05	2.24	2.37
1900	12.64	14.68	16.69	18.66	20.59	22.47	24.68	26.84	28.91	31.26	32.88	35.97	40.86	43.93	45.59	48.03	49.68		1900	0.00	0.								

Table 11. Basic Horsepower Ratings("8V" Section)

Unit : HP

RPM of Faster Shaft	Rated HP per belt for small Sheave Outside diameter. mm																	RPM of Faster Shaft	Additional HP per belt for speed ratio										
	300	315	335	355	375	400	425	450	460	476	500	520	540	560	600	630	710		1.00 ~1.01	1.02 ~1.05	1.06 ~1.11	1.12 ~1.18	1.19 ~1.26	1.27 ~1.38	1.39 ~1.57	1.58 ~1.94	1.95 ~3.38	3.39 & over	
485	23.38	25.82	29.03	32.24	35.42	39.34	43.24	47.10	48.65	50.94	54.72	57.72	60.70	63.65	69.48	73.78	84.97	485	0.00	0.27	0.74	1.30	1.77	2.13	2.51	2.82	3.07	3.26	
575	26.88	29.69	33.43	37.14	40.80	45.35	49.84	54.28	56.03	58.66	62.98	66.39	69.79	73.12	79.71	84.53	96.96	575	0.00	0.32	0.88	1.54	2.09	2.53	2.96	3.34	3.63	3.86	
690	31.07	34.37	38.73	43.04	47.29	52.55	57.72	62.82	64.83	67.82	72.73	76.61	80.42	84.18	91.50	96.84	110.32	690	0.00	0.39	1.06	1.85	2.51	3.04	3.57	4.01	4.37	4.62	
725	32.29	35.74	40.27	44.75	49.17	54.62	59.99	65.27	67.35	70.44	75.52	79.50	83.43	87.29	94.80	100.24	113.91	725	0.00	0.40	1.11	1.93	2.64	3.19	3.74	4.21	4.58	4.87	
870	37.06	41.03	46.27	51.41	56.47	62.68	68.74	74.66	76.98	80.43	82.01	90.40	94.68	98.83	106.80	112.47	126.21	870	0.00	0.50	1.33	2.32	3.16	3.83	4.49	5.05	5.51	5.83	
950	39.49	43.74	49.32	54.79	60.15	66.70	73.08	79.29	81.72	85.29	91.10	95.59	99.96	104.18	112.20	117.82	131.03	950	0.00	0.54	1.46	2.53	3.46	4.18	4.91	5.52	6.02	6.37	
1160	45.12	49.99	56.34	63.51	68.51	75.75	82.69	89.32	91.88	95.62	101.58	106.09	110.36	114.40	121.70	126.49		1160	0.00	0.66	1.78	3.10	4.22	5.11	5.99	6.74	7.35	7.77	
1425	50.58	56.01	63.00	69.69	76.09	83.61	90.63	97.08	99.49	102.94	108.19	111.93	115.25					1425	0.00	0.80	2.18	3.81	5.19	6.27	7.36	8.28	9.02	9.56	
1750	54.44	60.15	67.33	73.99	80.12	86.96	92.86											1750	0.00	0.98	2.68	4.68	6.37	7.71	9.03	10.16	11.07	11.73	
10	0.76	0.83	0.91	1.01	1.09	1.19	1.30	1.41	1.45	1.51	1.62	1.70	1.78	1.88	2.04	2.17	2.49	10	0.00	0.00	0.01	0.03	0.04	0.04	0.05	0.05	0.07	0.07	
20	1.43	1.55	1.72	1.89	2.05	2.25	2.47	2.67	2.75	2.87	3.07	3.23	3.40	3.57	3.89	4.13	4.76	20	0.00	0.01	0.03	0.05	0.07	0.09	0.11	0.12	0.12	0.13	
30	2.05	2.24	2.48	2.72	2.96	3.27	3.57	3.87	3.99	4.17	4.46	4.71	4.95	5.27	5.66	6.01	6.94	30	0.00	0.01	0.04	0.08	0.11	0.13	0.16	0.17	0.19	0.20	
40	2.65	2.90	3.22	3.54	3.86	4.25	4.65	5.04	5.20	5.43	5.82	6.13	6.45	6.76	7.37	7.83	9.05	40	0.00	0.03	0.07	0.11	0.15	0.17	0.20	0.23	0.25	0.27	
50	3.24	3.54	3.94	4.33	4.72	5.21	5.70	6.18	6.37	6.66	7.14	7.53	7.91	8.30	9.05	9.62	11.13	50	0.00	0.03	0.08	0.13	0.19	0.21	0.25	0.29	0.32	0.34	
60	3.82	4.17	4.64	5.21	5.56	6.15	6.74	7.31	7.53	7.87	8.45	8.90	9.36	9.80	10.71	11.38	13.16	60	0.00	0.04	0.09	0.16	0.21	0.27	0.31	0.35	0.38	0.40	
70	4.38	4.79	5.32	5.86	6.41	7.06	7.73	8.40	8.66	9.06	9.72	10.24	10.76	11.29	12.33	13.11	15.17	70	0.00	0.04	0.11	0.19	0.25	0.31	0.36	0.40	0.44	0.47	
80	4.93	5.39	6.01	6.61	7.23	7.98	8.73	9.49	9.79	10.23	10.98	11.58	12.17	12.76	13.94	14.83	17.16	80	0.00	0.04	0.12	0.21	0.29	0.35	0.42	0.47	0.51	0.54	
90	5.47	5.98	6.66	7.35	8.03	8.87	9.72	10.55	10.88	11.39	12.23	12.90	13.55	14.21	15.52	16.51	19.12	90	0.00	0.05	0.13	0.24	0.32	0.40	0.47	0.52	0.56	0.60	
100	6.01	6.57	7.32	8.07	8.82	9.76	10.68	11.61	11.98	12.53	13.46	14.18	14.92	15.64	17.10	18.19	21.06	100	0.00	0.05	0.15	0.27	0.36	0.44	0.52	0.58	0.63	0.67	
110	6.53	7.14	7.98	8.79	9.61	10.63	11.65	12.67	13.07	13.67	14.68	15.47	16.27	17.06	18.66	19.84	22.98	110	0.00	0.07	0.17	0.29	0.40	0.48	0.56	0.64	0.70	0.74	
120	7.04	7.72	8.62	9.50	10.39	11.50	12.60	13.70	14.14	14.79	15.88	16.74	17.61	18.47	20.20	21.47	24.88	120	0.00	0.07	0.19	0.32	0.44	0.52	0.62	0.70	0.76	0.92	
130	7.56	8.28	9.25	10.21	11.17	12.36	13.54	14.73	15.20	15.90	17.08	18.02	18.94	19.87	21.73	23.11	26.77	130	0.00	0.07	0.20	0.35	0.47	0.58	0.67	0.75	0.82	0.87	
140	8.07	8.85	9.88	10.91	11.93	13.20	14.48	15.75	16.25	17.01	18.26	19.26	20.25	21.26	23.24	24.72	28.63	140	0.00	0.08	0.21	0.38	0.51	0.62	0.72	0.82	0.88	0.94	
150	8.57	9.40	10.50	11.60	12.69	14.05	15.40	16.76	17.29	18.10	19.44	20.51	21.57	22.63	24.75	26.31	30.48	150	0.00	0.08	0.23	0.40	0.55	0.66	0.78	0.87	0.95	1.01	
160	9.06	9.95	11.11	12.28	13.45	14.89	16.33	17.76	18.32	19.18	20.60	21.74	22.87	23.99	26.23	27.91	32.33	160	0.00	0.09	0.24	0.43	0.58	0.71	0.83	0.92	1.02	1.07	
170	9.56	10.48	11.73	12.96	14.18	15.71	17.24	18.75	19.36	20.25	21.77	22.96	24.16	25.35	27.71	29.48	34.16	170	0.00	0.09	0.25	0.46	0.62	0.75	0.87	0.99	1.07	1.14	
180	10.04	11.02	12.33	13.63	14.93	16.54	18.15	19.75	20.38	21.33	22.91	24.17	25.43	26.69	29.18	31.05	35.97	180	0.00	0.11	0.28	0.48	0.66	0.79	0.92	1.05	1.14	1.21	
190	10.52	11.55	12.94	14.30	15.66	17.36	19.05	20.72	21.39	22.39	24.05	25.38	26.70	28.02	30.64	32.59	37.76	190	0.00	0.11	0.29	0.51	0.70	0.83	0.98	1.10	1.21	1.27	
200	11.01	12.09	13.53	14.96	16.39	18.16	19.93	21.69	22.40	23.45	25.19	26.58	27.96	29.34	32.09	34.13	39.54	200	0.00	0.12	0.31	0.54	0.72	0.88	1.03	1.17	1.26	1.34	
250	13.34	14.68	16.45	18.20	19.66	21.14	23.11	24.31	26.47	27.33	28.62	30.75	32.45	34.14	35.84	39.18	41.68	48.27	250	0.00	0.13	0.39	0.67	0.91	1.10	1.29	1.45	1.58	1.68
300	15.60	17.18	19.28	21.35	23.43	26.01	28.55	31.10	32.12	33.63	36.14	38.14	40.13	42.12	42.02	48.97	56.68	300	0.00	0.17	0.46	0.80	1.09	1.33	1.55	1.74	1.90	2.01	
350	17.79	19.61	22.01	24.41	26.78	29.75	32.68	35.60	37.29	38.50	41.37	43.66	45.94	48.20	52.68	56.02	64.77	350	0.00	0.20	0.54	0.94	1.27	1.54	1.81	2.04	2.21	2.35	
400	19.92	21.96	24.68	27.37	30.05	33.99	36.69	39.97	41.27	43.22	46.45	49.01	51.55	54.09	59.10	62.82	72.55	400	0.00	0.23	0.62	1.07	1.46	1.77	2.06	2.32	2.53	2.68	
450	21.97	24.25	27.27	30.21	33.24	36.93	40.59	44.21	45.66	47.80	51.37	54.20	57.00	59.79	65.29	69.36	79.97	450	0.00	0.25	0.68	1.21	1.64	1.98	2.32	2.61	2.84	3.02	
500	23.98	26.47	29.79	33.07	36.33	40.38	44.37	48.34	49.91	52.25	56.14	59.21	62.25	65.28	71.25	75.64	87.05	500	0.00	0.28	0.76	1.34	1.82	2.20	2.59	2.91	3.16	3.35	
550	25.92	28.63	32.24	35.80	39.34	43.71	48.04	52.32	54.02	56.55	60.74	64.05	67.32	70.56	76.94	81.64	93.75	550	0.00	0.31	0.84	1.47	2.00	2.43	2.84	3.19	3.49	3.69	
600	27.82	30.74	34.61	38.46	42.27	46.96	51.61	56.19	58.00	60.71	65.17	68.70	72.18	75.63	82.39	87.35	100.05	600	0.00	0.34	0.92	1.61	2.18	2.64	3.10	3.49	3.79	4.02	
650	29.65	32.79	36.93	41.03	45.09	50.11	55.05	59.92	61.85	64.72	69.45	73.18	76.85	80.47	87.83	92.75	105.94	650	0.00	0.36	0.99	1.74	2.36	2.87	3.35	3.78	4.12	4.36	
700	31.42	34.76	39.17	43.53	47.84	53.15	58.38	63.51	65.55	68.57	73.54	77.44	81.29	85.08	92.47	97.83	111.37	700	0.00	0.39	1.07	1.88	2.55	3.08	3.62	4.06	4.42	4.69	
750	33.15	36.69	41.34	45.95	50.50	56.09	61.58	66.97	69.10	72.27	77.45	81.51	85.51	89.44	97.06	102.57	116.34	750	0.00	0.42	1.15	2.00	2.72	3.31	3.87	4.36	4.75	5.03	
800	34.83	38.54	43.45	48.28	53.06	58.91	64.65	70.28	72.49	75.79	81.17	85.38	89.50	93.54	101.34	106.96	120.82	800	0.00	0.46	1.22	2.13	2.91	3.53	4.13	4.65	5.07	5.36	
850	36.43	40.34	45.48	50.54	55.52	61.62	67.60	73.45	75.74	79.14	84.69	89.02	93.24	97.37	105.31	110.97	124.77	850	0.00	0.48	1.30	2.27	3.10	3.74	4.38	4.93	5.38	5.70	
900	37.99	42.06	47.43	52.71	57.88	64.22	70.42	76.45	78.81	82.31	88.00	92.43	96.73	100.92	108.93	114.60	128.19	900	0.00	0.51	1.38	2.40							

Timing Belts

Before designing DRB Timing Belt Drive, you need to know the following drive requirement.

1. Horsepower requirement of the drive
2. The RPM of the driver machine
3. The RPM of the driven machine or speed ratio
4. The approximate center distance for the drive
5. Hours per day operation and type of driven machine

Step 1. Calculate the Design Horsepower

Design Horsepower = Horsepower × (Service factor + Idler service factor + Speed ratio factor)

- To calculate the design power it is necessary to determine the service factor for the drive. Using the service factor **Table 1**, determine the type of driven machine.
- Using the service factor **Table 1**, determine the service factor for the driven machine, based on the type of driven machine and the type of operational service.
- Using **Table 2** and **Table 3**, determine idler service factor and speed ratio factor.
- Multiply the power requirement of the drive by the service factor you have selected. This gives you the design power for use in designing condition.

Table 1. Service Factors

Type of Driven Machine	Types of Driving Units					
The driven machines listed below are representative samples only. Selected a driven machine whose load characteristics most closely approximate those of the machine being considered.	AC Motors : Normal Torque, Squirrel Cage, Synchronous, Split Phase.			AC motors : high torque, high slip, repulsion Induction, single phase, series wound, slipring.		
	DC Motors : Shunt Wound Engines: Multiple Cylinder Internal Combustion			DC Motors : Series Wound, Compound Wound Engines: Single cylinder internal combustion. Line shafts. Clutches.		
	Intermittent Service	Normal Service	Continuous Service	Intermittent Service	Normal Service	Continuous Service
	3-8 Hours Daily or Seasonal	8-16 Hours Daily	16-24 Hours Daily	3-8 Hours Daily or Seasonal	8-16 Hours Daily	8-16 Hours Daily
Display equipment. Dispensing equipment. Instrumentation. Measuring device Medical equipment. Projection equipment.	1.0	1.2	1.4	1.2	1.4	1.6
Appliances. Sweepers. Sewing machines. Office equipment. Wood lathes. Band saws.	1.2	1.4	1.6	1.4	1.6	1.8
Conveyors: Belts, Light Package. Oven. Screens. Drum. Conical.	1.3	1.5	1.7	1.5	1.87	1.9

Table 1. Service Factors

Type of Driven Machine	Types of Driving Units					
	AC Motors : Normal Torque, Squirrel Cage, Synchronous, Split Phase.			AC motors : high torque, high slip, repulsion Induction, single phase, series wound, slipping.		
	DC Motors : Shunt Wound Engines: Multiple Cylinder Internal Combustion			DC Motors : Series Wound, Compound Wound Engines: Single cylinder internal combustion. Line shafts. Clutches.		
The driven machines listed below are representative samples only. Selected a driven machine whose load characteristics most closely approximate those of the machine being considered.	Intermittent Service	Normal Service	Continuous Service	Intermittent Service	Normal Service	Continuous Service
	3-8 Hours Daily or Seasonal	8-16 Hours Daily	16-24 Hours Daily	3-8 Hours Daily or Seasonal	8-16 Hours Daily	8-16 Hours Daily
Agitators for liquids. Dough Mixers. Drill Press. Lathes. Screw machines. Jointers. Circular saws. Planers. Laundry machinery. Paper Machinery(except pulpers). Printing machinery.	1.4	1.6	1.8	1.6	1.8	2.0
Agitators for semi-liquids. Brick machinery(except pug mills) Conveyor belt: Ore, Coal, Sand. Line Shafts. Machine tools : Grinder. Shaper. Boring Mill. Milling machines. Pumps : Centrifugal, Gear, Rotary, Pipe line. Screens : Vibrating cam type. Textile : Warpings, Reels. Compressor : Centrifugal.	1.5	1.7	1.9	1.7	1.9	2.1
Conveyor : Apron, Pan, Bucket, Elevator. Extractors, Washers. Fans. Blowers. Centrifugal induced draft Exhausters. Generators & Exciters. Hoists. Elevators. Rubber calender. Mills. Extruders. Saw mill machinery. Textile machinery : Looms, Spinning frame, Twisters.	1.6	1.8	2.0	1.8	2.0	2.2
Centrifuges. Conveyors : Flight, Screw. Hammer mills. Paper pulpers.	1.7	1.9	2.1	1.9	2.1	2.3
Brick & Clay pug mills. Fans. Blowers. Propellor mine fans. Positive blowers.	1.8	2.0	2.2	2.0	2.2	2.4
Reciprocating compressors. Mills: Ball, Rod, Pebble, etc. Pumps: Reciprocating.	1.9	2.1	2.3	2.1	2.3	2.5

Table 2. Idler Service Factor

Idler Position	Service Factor
① Inside of Slack Side	0.0
② Outside of Slack Side	0.1
③ Inside of Tight Side	0.1
④ Outside of Tight Side	0.2

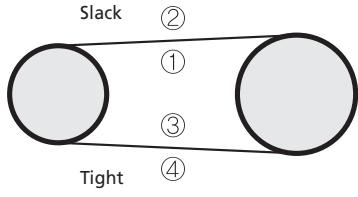


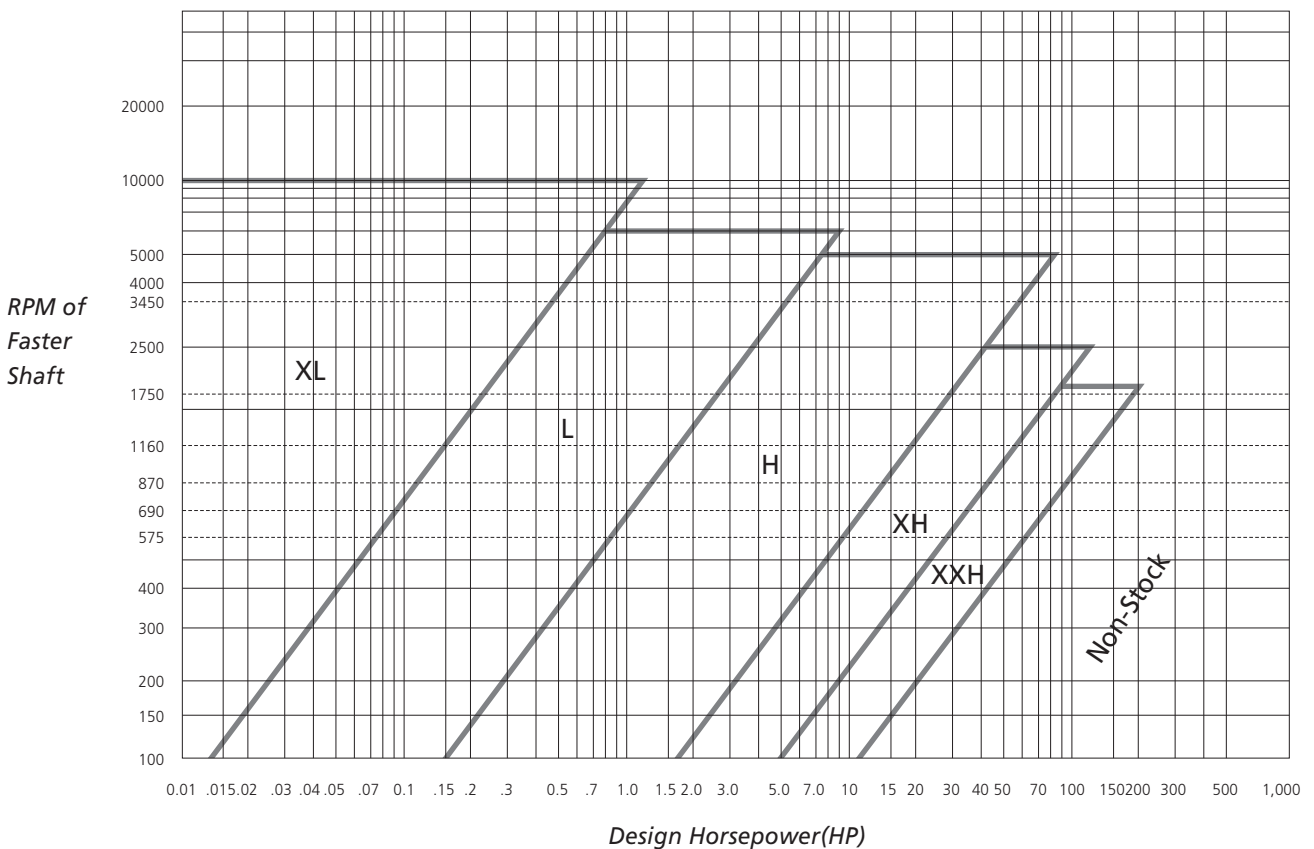
Table 3. Speed Ratio Factor

Speed Ratio	Factor
1.00 ~ 1.23	0.0
1.24 ~ 1.73	0.1
1.74 ~ 2.48	0.2
2.49 ~ 3.48	0.3
3.49 over	0.4

Step 2. Select the Proper Belt Pitch

The belt pitch is obtained from a selection guide by using the design HP and rpm of the faster pulley or sprocket. Figure 1 is pitch selection guide used for determining the correct belt pitch.

Figure 1. Belt Pitch Selection Guide



Step 3. Select the Pulley Combination, Belt Length and Center Distance

1. Select the minimum number of grooves and pitch diameter of small pulley.

For the speed selected select the minimum number of grooves and pitch diameter of small pulley

Table 4. Minimum number of grooves for trapezoid type

RPM of Faster Shaft	Belt Section					
	MXL	XL	L	H	XH	XXH
3450	16	12	16	20	30	-
1750	14	12	14	18	26	26
1160	12	10	12	16	24	24
870	-	10	12	14	22	22

2. Use the following formula to select pitch diameter of large pulley.

Equation 1

$$Z_2 = \frac{n_1}{n_2} \times Z_1$$

$$\text{Speed Ratio} = \frac{n_1}{n_2}$$

Where Z_1 : The number of teeth for small pulley
 Z_2 : The number of teeth for large pulley
 n_1 : Revolution of small pulley(rpm)
 n_2 : Revolution of large pulley(rpm)

Equation 2

$$D_p = \frac{\text{pitch} \times Z_2}{\pi}$$

D_p : Pitch diameter of large pulley

Equation 3

$$d_p = \frac{\text{pitch} \times Z_1}{\pi}$$

d_p : Pitch diameter of small pulley

3. Determine the nominal center distance and belt length of a drive.

A. Use the following formula to calculate required belt length.

Equation 4

$$L_p = 2C + 1.57(D_p - d_p) + \frac{(D_p - d_p)^2}{4C}$$

Where L_p : Pitch length of belt(mm)
 C : Approximate center distance(mm)
 D_p : Pitch diameter of large pulley(mm)
 d_p : Pitch diameter of small pulley(mm)

B. Select the nearest suitable belt length using the size listing on the table.

Table 5. Standard Pitch Length and Tolerances

Belt Length Designation	Pitch Length		Permissible Deviation from Standard Length		Number of Teeth for Standard Lengths					
	Min	Inch	Min	Inch	MXL (0.080)	XL (0.200)	L (0.375)	H (0.500)	XH (0.875)	XXH (1.250)
36	91.44	3.600	±0.41	±0.016	45					
40	101.60	4.000	±0.41	±0.016	50					
44	111.76	4.400	±0.41	±0.016	55					
48	121.92	4.800	±0.41	±0.016	60					
56	142.24	5.600	±0.41	±0.016	70					
60	152.40	6.000	±0.41	±0.016	75	30				
64	162.56	6.400	±0.41	±0.016	80					
70	177.80	7.000	±0.41	±0.016		35				
72	182.88	7.200	±0.41	±0.016	90					
80	203.20	8.000	±0.41	±0.016	100	40				
88	223.52	8.800	±0.41	±0.016	110					
90	228.60	9.000	±0.41	±0.016		45				
100	254.00	10.000	±0.41	±0.016	125	50				
110	279.40	11.000	±0.46	±0.018		55				
112	284.48	11.200	±0.46	±0.018	140					
120	304.80	12.000	±0.46	±0.018		60				
124	314.33	12.375	±0.46	±0.018			33			
124	314.96	12.400	±0.46	±0.018	155					
130	330.20	13.000	±0.46	±0.018		65				
140	355.60	14.000	±0.46	±0.018	175	70				
150	381.00	15.000	±0.46	±0.018		75	40			
160	406.40	16.000	±0.51	±0.02	200	80				
170	431.80	17.000	±0.51	±0.02		85				
180	457.20	18.000	±0.51	±0.02	225	90				
187	476.25	18.750	±0.51	±0.02			50			
190	482.60	19.000	±0.51	±0.02		95				
200	508.00	20.000	±0.51	±0.02	250	100				
210	533.40	21.000	±0.61	±0.024		105	56			
220	558.80	22.000	±0.61	±0.024		110				
225	571.50	22.500	±0.61	±0.024			60			
230	584.20	23.000	±0.61	±0.024		115				
240	609.60	24.000	±0.61	±0.024		120	64	48		
250	635.00	25.000	±0.61	±0.024		125				
255	647.70	25.500	±0.61	±0.024			68			
260	660.40	26.600	±0.61	±0.024		130				
270	685.80	27.000	±0.61	±0.024			72	54		
285	723.90	28.500	±0.61	±0.024			76			
300	762.00	30.000	±0.61	±0.024			80	60		
322	819.15	32.250	±0.66	±0.026			86			
330	838.20	33.000	±0.66	±0.026				66		
345	876.30	34.500	±0.66	±0.026			92			
360	914.40	36.000	±0.66	±0.026				72		
367	933.45	36.750	±0.66	±0.026			98			
390	990.60	39.000	±0.66	±0.026			104	78		
420	1066.80	42.000	±0.76	±0.03			112	84		

Table 5. Standard Pitch Length and Tolerances

Belt Length Designation	Pitch Length		Permissible Deviation from Standard Length		Number of Teeth for Standard Lengths					
	Min	Inch	Min	Inch	MXL (0.080)	XL (0.200)	L (0.375)	H (0.500)	XH (0.875)	XXH (1.250)
450	1143.00	45.000	±0.76	±0.03				90		
480	1219.20	48.000	±0.76	±0.03			120	96		
507	1289.05	50.750	±0.81	±0.032			128		58	
510	1295.40	51.000	±0.81	±0.032				102		
540	1371.60	54.000	±0.81	±0.032			136	108		
560	1422.40	56.000	±0.81	±0.032			144		64	
570	1447.80	57.000	±0.81	±0.032				114		
600	1524.00	60.000	±0.81	±0.032				120		
630	1600.20	63.000	±0.86	±0.034			160	126	72	
660	1676.40	66.000	±0.86	±0.034				132		
700	1778.00	70.000	±0.86	±0.034				140	80	56
750	1905.00	75.000	±0.91	±0.036				150		
770	1955.80	77.000	±0.91	±0.036					88	
800	2032.00	80.000	±0.91	±0.036				160		64
840	2133.60	84.000	±0.97	±0.038					96	
850	2159.00	85.000	±0.97	±0.038				170		
900	2286.00	90.000	±0.97	±0.038				180		72
980	2489.20	98.000	±1.02	±0.04					112	
1000	2540.00	100.000	±1.02	±0.04				200		80
1100	2794.00	110.000	±1.07	±0.042				220		
1120	2844.80	112.000	±1.12	±0.044					128	
1200	3048.00	120.000	±1.12	±0.044						96
1250	3175.00	125.000	±1.17	±0.046				250		
1260	3200.40	126.000	±1.17	±0.046					144	
1400	3556.00	140.000	±1.22	±0.048				280	160	112
1540	3911.60	154.000	±1.32	±0.052					176	
1600	4064.00	160.000	±1.32	±0.052						128
1700	4318.00	170.000	±1.37	±0.054				340		
1750	4445.00	175.000	±1.42	±0.056					200	
1800	4572.00	180.000	±1.42	±0.056						144

C. Use the following formula to calculate center distance

Equation 5

$$C = \frac{K + \sqrt{K^2 - 32(D_p - d_p)^2}}{16}$$

Where

$$K = 4L_p - 6.28(D_p + d_p)$$

C: Center distance(mm)

L_p: Standard pitch length(mm)

D_p: Pitch diameter of large pulley(mm)

d_p: Pitch diameter of small pulley(mm)

Step 4. Calculate the Belt Width

1. Use the following formula to establish the number of teeth in mesh.

Equation 6

$$Z_m = Z_1 \times \frac{\theta_1}{360}$$

Equation 7

$$\theta_1 = 180 - \frac{57(D_p - d_p)}{C}$$

Where

- Z_m : The number of teeth in mesh on the small pulley
- Z_1 : The number of teeth on the small pulley
- θ_1 : The arc of contact on the small pulley
- D_p : The pitch diameter of large pulley(mm)
- d_p : The pitch diameter of small pulley(mm)

Table 6. Teeth in Mesh Factor

Teeth in Mesh	6 or more	5	4	3	2
Factor	1	0.8	0.6	0.4	0.2

2. Basic Horsepower Rating

Find the appropriate basic HP rating from **Table 8** horsepower rating table.

3. Calculation of Belt Width

Divide the design horsepower found in **Step 1** by basic horsepower rating in **Step 5**

This gives the belt width factor.

Equation 8

$$K_b = \frac{P_d}{P_r \cdot K_M}$$

Where

- K_b : Belt width factor
- P_d : Design power
- P_r : Horse power rating per width
- K_M : Teeth in mesh factor

Table 7. Belt Width Factor

Belt Section	Belt Width - mm (inches)									
	6.4 (0.25)	9.7 (0.38)	12.7 (0.50)	19.1 (0.75)	25.4 (1.00)	38.1 (1.50)	50.8 (2.00)	76.2 (3.00)	101.6 (4.00)	127.0 (5.00)
XL (0.200)	0.62	1.00								
L (0.375)			0.45	0.72	1.00					
H (0.500)				0.21	0.29	0.45	0.63	1.00		
XH (0.875)							0.45	0.72	1.00	
XXH (1.250)							0.35	0.56	0.78	1.00

Horsepower and Torque Rating Formulas

Torque Rating

It is customary to use torque load requirements rather than horsepower load when designing drives using the small pitch MXL section belts. Since these belts operate on small diameters resulting in relatively low belt speeds, torque is essentially constant for all rpms. These ratings are based on the following formulas :

SI Units

Belt Section	Belt Width - mm	Formula
MXL (2.032)	3.0	$Q_r = d [5.00 - 9.50 \times 10^{-6} d^2]$
	4.8	$Q_r = d [8.34 - 1.58 \times 10^{-5} d^2]$
	6.4	$Q_r = d [11.7 - 2.22 \times 10^{-5} d^2]$

Where Q_r : The Maximum torque rating(N-mm) for a belt of specific width having six or more teeth in mesh and a pulley surface speed of 33 m/s or less.
 Torque ratings for drives with less than six teeth in mesh must be corrected as shown in **Table 6**, Teeth in Mesh Factor.
 d : Pitch diameter of smaller pulley(mm)

Inch-Pound Units

Belt Section	Belt Width (Inches)	Formula
MXL (0.080)	0.12	$Q_r = d [1.13 - 1.38 \times 10^{-3} d^2]$
	0.19	$Q_r = d [1.88 - 2.30 \times 10^{-3} d^2]$
	0.25	$Q_r = d [2.63 - 3.21 \times 10^{-3} d^2]$

Where Q_r : The Maximum torque rating(lbf-inches) for a belt of specific width having six or more teeth in mesh and a pulley surface speed of 6500 feet/minute or less.
 Torque ratings for drives with less than six teeth in mesh must be corrected as shown in **Table 6**, Teeth in Mesh Factor.
 d : Pitch diameter of smaller pulley(Inches)

Horsepower Rating

Horsepower ratings are used for belt sections XL, L, H, XH, XXH. These ratings are for the widest standard belt. To obtain the horsepower rating for other belt widths, multiply the horsepower rating by the appropriate factor shown in **Table 7**.

Kilowatt Ratings

Belt Section	Belt Width - mm	Formula
XL (5.08)	9.7	$P_r = dr [2.69 \times 10^{-3} - 3.22 \times 10^{-9} (dr)^2]$
L (5.08)	25.4	$P_r = dr [1.28 \times 10^{-2} - 1.37 \times 10^{-8} (dr)^2]$
H (12.7)	76.2	$P_r = dr [1.10 \times 10^{-1} - 6.43 \times 10^{-8} (dr)^2]$
XH (22.225)	101.6	$P_r = dr [2.12 \times 10^{-1} - 2.13 \times 10^{-7} (dr)^2]$
XXH (31.75)	127.0	$P_r = dr [3.35 \times 10^{-1} - 3.55 \times 10^{-7} (dr)^2]$

Where P_r : The maximum kilowatt rating recommended for the Specified standard belt width having six or more teeth in mesh and a pulley surface speed of 33m/s or less. Kilowatt ratings for drives with less than six teeth in mesh must be corrected as shown in **Table 6**, Teeth in Mesh Factor.
 d : Pitch diameter of smaller pulley(mm)
 r : rpm of faster shaft divided by 1000.

Horsepower Ratings

Belt Section	Belt Width(Inches)	Formula
XL (0.200)	0.38	$P_r = dr [0.0916 - 7.07 \times 10^{-5}(dr)^2]$
L (0.375)	1.00	$P_r = dr [0.436 - 3.01 \times 10^{-4}(dr)^2]$
H (0.500)	3.00	$P_r = dr [3.73 - 1.41 \times 10^{-3}(dr)^2]$
XH (0.875)	4.00	$P_r = dr [7.21 - 4.68 \times 10^{-3}(dr)^2]$
XXH (1.250)	5.00	$P_r = dr [11.4 - 7.81 \times 10^{-3}(dr)^2]$

Where P_r : The maximum horsepower rating recommended for the Specified standard belt width having six or more teeth in mesh and a pulley surface speed of 6500 feet/minute or less. Horsepower ratings for drives with less than six teeth in mesh must be corrected as shown in **Table 6**, Teeth in Mesh Factor.
 d : Pitch diameter of smaller pulley(Inches)
 r : rpm of faster shaft divided by 1000.

* Total horsepower ratings for double-sided belts are the same as single-sided belts. Contact us for percent of horsepower available for each side of the belt.

Table 8-1. Timing Belt Horsepower Rating(XL, 5.08mm Pitch Belts)

Unit : HP

RPM of Faster Shaft	Rated HP per belt for small pulley												
	10XL (16.17)	11XL (17.79)	12XL (19.40)	14XL (22.64)	15XL (24.26)	16XL (25.87)	18XL (29.11)	20XL (32.34)	21XL (33.96)	22XL (35.57)	24XL (38.81)	28XL (45.28)	30XL (48.51)
100	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.06	0.06
200	0.04	0.05	0.05	0.06	0.06	0.07	0.08	0.08	0.09	0.09	0.10	0.12	0.13
300	0.06	0.07	0.08	0.09	0.09	0.10	0.11	0.13	0.13	0.14	0.15	0.18	0.19
400	0.08	0.09	0.10	0.12	0.13	0.13	0.15	0.17	0.18	0.18	0.20	0.24	0.25
500	0.11	0.12	0.13	0.15	0.16	0.17	0.19	0.21	0.22	0.23	0.25	0.29	0.31
600	0.13	0.14	0.15	0.18	0.19	0.20	0.23	0.25	0.26	0.28	0.30	0.35	0.38
700	0.15	0.16	0.18	0.21	0.22	0.24	0.26	0.29	0.31	0.32	0.35	0.41	0.44
800	0.17	0.18	0.20	0.24	0.25	0.27	0.30	0.34	0.35	0.37	0.40	0.47	0.50
900	0.19	0.21	0.23	0.26	0.28	0.30	0.34	0.38	0.40	0.42	0.45	0.53	0.57
1000	0.21	0.23	0.25	0.29	0.31	0.34	0.38	0.42	0.44	0.46	0.50	0.59	0.63
1100	0.23	0.25	0.28	0.32	0.35	0.37	0.42	0.46	0.48	0.51	0.55	0.65	0.69
1100	0.24	0.27	0.29	0.34	0.37	0.39	0.44	0.49	0.51	0.54	0.58	0.68	0.73
1200	0.25	0.28	0.30	0.35	0.38	0.40	0.45	0.50	0.53	0.55	0.60	0.70	0.75
1300	0.27	0.30	0.33	0.38	0.41	0.44	0.49	0.55	0.57	0.60	0.65	0.76	0.82
1400	0.29	0.32	0.35	0.41	0.44	0.47	0.53	0.59	0.62	0.65	0.70	0.82	0.88
1500	0.31	0.35	0.38	0.44	0.47	0.50	0.57	0.63	0.66	0.69	0.75	0.88	0.94
1600	0.34	0.37	0.40	0.47	0.50	0.54	0.60	0.67	0.70	0.74	0.80	0.94	1.00
1700	0.36	0.39	0.43	0.50	0.53	0.57	0.64	0.71	0.75	0.78	0.85	0.99	1.06
1700	0.37	0.40	0.44	0.51	0.55	0.59	0.66	0.73	0.77	0.81	0.88	1.02	1.09
1800	0.38	0.42	0.45	0.53	0.57	0.60	0.68	0.75	0.79	0.83	0.90	1.05	1.13
1900	0.40	0.44	0.48	0.56	0.60	0.64	0.72	0.79	0.83	0.87	0.95	1.11	1.19
2000	0.42	0.46	0.50	0.59	0.63	0.67	0.75	0.84	0.88	0.92	1.00	1.17	1.25
2100	0.44	0.48	0.53	0.62	0.66	0.70	0.79	0.88	0.92	0.96	1.05	1.22	1.31
2200	0.46	0.51	0.55	0.65	0.69	0.74	0.83	0.92	0.96	1.01	1.10	1.28	1.37
2300	0.48	0.53	0.58	0.67	0.72	0.77	0.87	0.96	1.01	1.06	1.15	1.34	1.43
2400	0.50	0.55	0.60	0.70	0.75	0.80	0.90	1.00	1.05	1.10	1.20	1.39	1.49
2500	0.52	0.58	0.63	0.73	0.78	0.84	0.94	1.04	1.09	1.15	1.25	1.45	1.55
2600	0.55	0.60	0.65	0.76	0.82	0.87	0.98	1.08	1.14	1.19	1.30	1.51	1.61
2700	0.57	0.62	0.68	0.79	0.85	0.90	1.01	1.13	1.18	1.24	1.35	1.56	1.67
2800	0.59	0.65	0.70	0.82	0.88	0.94	1.05	1.17	1.22	1.28	1.39	1.62	1.73
2900	0.61	0.67	0.73	0.85	0.91	0.97	1.09	1.21	1.27	1.33	1.44	1.68	1.79
3000	0.63	0.69	0.75	0.88	0.94	1.00	1.13	1.25	1.31	1.37	1.49	1.73	1.85
3100	0.65	0.71	0.78	0.91	0.97	1.03	1.16	1.29	1.35	1.41	1.54	1.79	1.91
3200	0.67	0.74	0.80	0.94	1.00	1.07	1.20	1.33	1.39	1.46	1.59	1.84	1.97
3300	0.69	0.76	0.83	0.96	1.03	1.10	1.24	1.37	1.44	1.50	1.64	1.90	2.02
3400	0.71	0.78	0.85	0.99	1.06	1.13	1.27	1.41	1.48	1.55	1.68	1.95	2.08
3500	0.73	0.81	0.88	1.02	1.09	1.17	1.31	1.45	1.52	1.59	1.73	2.01	2.14
3600	0.75	0.83	0.90	1.05	1.13	1.20	1.35	1.49	1.56	1.64	1.78	2.06	2.20
3700	0.77	0.85	0.93	1.08	1.16	1.23	1.38	1.53	1.61	1.68	1.83	2.11	2.25
3800	0.79	0.87	0.95	1.11	1.19	1.26	1.42	1.57	1.65	1.72	1.87	2.17	2.31
3900	0.82	0.90	0.98	1.14	1.22	1.30	1.45	1.61	1.69	1.77	1.92	2.22	2.37
4000	0.84	0.92	1.00	1.17	1.25	1.33	1.49	1.65	1.73	1.81	1.97	2.27	2.42
4100	0.86	0.94	1.03	1.19	1.28	1.36	1.53	1.69	1.77	1.85	2.01	2.33	2.48
4200	0.88	0.96	1.05	1.22	1.31	1.39	1.56	1.73	1.81	1.90	2.06	2.38	2.53
4300	0.90	0.99	1.08	1.25	1.34	1.43	1.60	1.77	1.86	1.94	2.11	2.43	2.59
4400	0.92	1.01	1.10	1.28	1.37	1.46	1.64	1.81	1.90	1.98	2.15	2.48	2.64
4500	0.94	1.03	1.13	1.31	1.40	1.49	1.67	1.85	1.94	2.02	2.20	2.53	2.70
4600	0.96	1.06	1.15	1.34	1.43	1.52	1.71	1.89	1.98	2.07	2.24	2.59	2.75
4800	1.00	1.10	1.20	1.39	1.49	1.59	1.78	1.97	2.05	2.15	2.33	2.69	2.86
5000	1.04	1.15	1.25	1.45	1.55	1.65	1.85	2.04	2.14	2.24	2.42	2.79	2.96
5400						1.78	1.99	2.20	2.30	2.40	2.60	2.98	3.16
5500						1.81	2.02	2.24	2.34	2.44	2.64	3.03	3.21
6000						1.97	2.20	2.42	2.53	2.64	2.86	3.26	3.45
6500						2.12	2.37	2.61	2.72	2.84	3.05	3.48	3.68
7000						2.27	2.53	2.79	2.91	3.03	3.26	3.69	3.89
7500						2.42	2.70	2.96	3.09	3.21	3.45	3.89	4.09
8000						2.57	2.86	3.13	3.26	3.39	3.64	4.07	4.27
8500							3.01	3.29	3.43	3.56	3.81	4.24	4.43
9000							3.16	3.45	3.59	3.72	3.97	4.40	4.57
9500							3.31	3.61	3.74	3.88	4.12	4.53	4.69
10000							3.45	3.75	3.89	4.02	4.27	4.65	4.79

Table 8-2. Timing Belt Horsepower rating(L, 9.525mm Pitch Belts)

Unit : HP

RPM of Faster Shaft	Rated horsepower for small pulley													
	10L (30.32)	12L (36.28)	14L (42.45)	16L (48.51)	18L (54.57)	20L (60.64)	22L (66.70)	24L (72.77)	26L (78.83)	28L (84.89)	30L (90.96)	32L (97.02)	40L (121.28)	48L (145.53)
100	0.05	0.06	0.07	0.08	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.17	0.21	0.25
200	0.11	0.13	0.15	0.17	0.19	0.21	0.23	0.25	0.27	0.30	0.32	0.34	0.42	0.51
300	0.16	0.19	0.22	0.25	0.29	0.32	0.35	0.38	0.41	0.44	0.48	0.51	0.63	0.76
400	0.21	0.25	0.30	0.34	0.38	0.42	0.46	0.51	0.55	0.59	0.63	0.68	0.84	1.01
500	0.26	0.32	0.37	0.42	0.48	0.53	0.58	0.63	0.69	0.74	0.79	0.84	1.05	1.26
600	0.32	0.38	0.44	0.51	0.57	0.63	0.70	0.76	0.82	0.88	0.95	1.01	1.26	1.51
700	0.37	0.44	0.52	0.59	0.66	0.74	0.81	0.88	0.96	1.03	1.10	1.18	1.47	1.76
800	0.42	0.51	0.59	0.68	0.76	0.84	0.93	1.01	1.09	1.18	1.26	1.34	1.67	2.00
800	0.46	0.55	0.64	0.73	0.83	0.92	1.01	1.10	1.19	1.28	1.37	1.46	1.82	2.17
900	0.48	0.57	0.66	0.76	0.85	0.95	1.04	1.14	1.23	1.32	1.42	1.51	1.88	2.24
1000	0.53	0.63	0.74	0.84	0.95	1.05	1.16	1.26	1.36	1.47	1.57	1.67	2.08	2.48
1100	0.58	0.70	0.81	0.93	1.04	1.16	1.27	1.39	1.50	1.61	1.72	1.84	2.28	2.71
1160	0.61	0.73	0.86	0.98	1.10	1.22	1.34	1.46	1.58	1.70	1.82	1.93	2.40	2.85
1200	0.63	0.76	0.88	1.01	1.14	1.26	1.39	1.51	1.63	1.76	1.88	2.00	2.48	2.94
1300	0.69	0.82	0.96	1.09	1.23	1.36	1.50	1.63	1.77	1.90	2.03	2.16	2.67	3.17
1400	0.74	0.88	1.03	1.18	1.32	1.47	1.61	1.76	1.90	2.04	2.18	2.32	2.87	3.39
1500	0.79	0.95	1.10	1.26	1.42	1.57	1.72	1.88	2.03	2.18	2.33	2.48	3.06	3.61
1600	0.84	1.01	1.18	1.34	1.51	1.67	1.84	2.00	2.16	2.32	2.48	2.63	3.24	3.82
1700	0.90	1.07	1.25	1.43	1.60	1.78	1.95	2.12	2.29	2.46	2.63	2.79	3.43	4.03
1700	0.92	1.10	1.29	1.47	1.65	1.83	2.00	2.18	2.35	2.53	2.70	2.87	3.52	4.13
1800	0.95	1.14	1.32	1.51	1.69	1.88	2.06	2.24	2.42	2.60	2.77	2.94	3.61	4.23
1900		1.20	1.40	1.59	1.79	1.98	2.17	2.36	2.55	2.73	2.91	3.09	3.79	4.42
2000		1.26	1.47	1.67	1.88	2.08	2.28	2.48	2.67	2.87	3.06	3.24	3.96	4.61
2100		1.32	1.54	1.76	1.97	2.18	2.39	2.60	2.80	3.00	3.20	3.39	4.13	4.79
2200		1.39	1.61	1.84	2.06	2.28	2.50	2.71	2.92	3.13	3.34	3.54	4.29	4.97
2300		1.45	1.68	1.92	2.15	2.38	2.61	2.83	3.05	3.26	3.47	3.68	4.45	5.13
2400		1.51	1.76	2.00	2.24	2.48	2.71	2.94	3.17	3.39	3.61	3.82	4.61	5.29
2500		1.57	1.83	2.08	2.33	2.58	2.82	3.06	3.29	3.52	3.74	3.96	4.76	5.44
2600		1.63	1.90	2.16	2.42	2.67	2.92	3.17	3.41	3.65	3.87	4.10	4.91	5.58
2700		1.69	1.97	2.24	2.51	2.77	3.03	3.28	3.53	3.77	4.00	4.23	5.05	5.71
2800		1.76	2.04	2.32	2.60	2.87	3.13	3.39	3.65	3.89	4.13	4.36	5.19	5.84
2900		1.82	2.11	2.40	2.68	2.96	3.24	3.50	3.76	4.01	4.25	4.49	5.32	5.95
3000		1.88	2.18	2.48	2.77	3.06	3.34	3.61	3.87	4.13	4.38	4.61	5.44	6.05
3100		1.94	2.25	2.56	2.86	3.15	3.44	3.72	3.99	4.25	4.49	4.73	5.56	6.15
3200			2.32	2.63	2.94	3.24	3.54	3.82	4.10	4.36	4.61	4.85	5.67	6.23
3300			2.39	2.71	3.03	3.34	3.64	3.93	4.20	4.47	4.73	4.97	5.78	6.30
3400			2.46	2.79	3.11	3.43	3.73	4.03	4.31	4.58	4.84	5.08	5.88	6.36
3500			2.53	2.87	3.20	3.52	3.83	4.13	4.42	4.69	4.94	5.19	5.97	6.41
3600			2.60	2.94	3.28	3.61	3.93	4.23	4.52	4.79	5.05	5.29	6.05	6.44
3700			2.66	3.02	3.36	3.70	4.02	4.33	4.62	4.89	5.15	5.39	6.13	6.47
3800			2.73	3.09	3.45	3.79	4.11	4.42	4.72	4.99	5.25	5.49	6.20	6.48
3900			2.80	3.17	3.53	3.87	4.20	4.52	4.81	5.09	5.35	5.58	6.27	6.48
4000			2.87	3.24	3.61	3.96	4.29	4.61	4.91	5.19	5.44	5.67	6.32	6.46
4100				3.32	3.69	4.04	4.38	4.70	5.00	5.28	5.53	5.76	6.37	6.43
4200				3.39	3.77	4.13	4.47	4.79	5.09	5.37	5.62	5.84	6.41	6.39
4300				3.47	3.85	4.21	4.56	4.88	5.18	5.45	5.70	5.91	6.44	6.33
4400				3.54	3.93	4.29	4.64	4.97	5.26	5.54	5.78	5.99	6.46	6.26
4500				3.61	4.00	4.38	4.73	5.05	5.35	5.62	5.85	6.05	6.48	6.17
4600				3.68	4.08	4.45	4.81	5.13	5.43	5.69	5.92	6.12	6.48	6.07
4700				3.75	4.15	4.53	4.89	5.21	5.51	5.77	5.99	6.18	6.48	5.95
4800				3.82	4.23	4.61	4.97	5.29	5.58	5.84	6.05	6.23	6.46	5.81
4900				3.89	4.30	4.69	5.04	5.37	5.65	5.90	6.11	6.28	6.44	5.66
5000				3.96	4.38	4.76	5.12	5.44	5.72	5.97	6.17	6.32	6.40	5.49
5200				4.10	4.52	4.91	5.26	5.58	5.86	6.09	6.27	6.39	6.31	5.10
5400				4.23	4.66	5.05	5.40	5.71	5.98	6.19	6.35	6.44	6.17	4.64
5600				4.36	4.79	5.19	5.54	5.81	6.09	6.28	6.41	6.47	5.99	4.10
5800				4.49	4.92	5.32	5.66	5.95	6.18	6.35	6.45	6.48	5.76	3.49
6000				4.61	5.05	5.44	5.78	6.05	6.27	6.41	6.48	6.46	5.49	2.79

Table 8-3. Timing Belt Horsepower rating(H, 12.7mm Pitch Belts)

Unit : HP

RPM of Faster Shaft	Rated horsepower for small pulley											
	14H (56.60)	16H (64.68)	18H (72.77)	20H (80.85)	22H (88.94)	24H (97.02)	26H (105.11)	28H (113.19)	30H (121.28)	32H (129.36)	40H (161.70)	48H (194.04)
100	0.25	0.29	0.32	0.36	0.39	0.43	0.47	0.50	0.54	0.57	0.72	0.86
200	0.50	0.57	0.65	0.72	0.79	0.86	0.93	1.00	1.08	1.15	1.43	1.72
300	0.75	0.86	0.97	1.08	1.18	1.29	1.40	1.50	1.61	1.72	2.15	2.58
400	1.00	1.15	1.29	1.43	1.58	1.72	1.86	2.01	2.15	2.29	2.86	3.43
500	1.25	1.43	1.61	1.79	1.97	2.15	2.33	2.51	2.68	2.86	3.57	4.28
600	1.50	1.72	1.93	2.15	2.36	2.58	2.79	3.00	3.22	3.43	4.28	5.12
700	1.76	2.01	2.26	2.51	2.75	3.00	3.25	3.50	3.75	4.00	4.98	5.96
800	2.01	2.29	2.58	2.86	3.15	3.43	3.71	4.00	4.28	4.56	5.68	6.79
870	2.18	2.49	2.80	3.11	3.42	3.73	4.04	4.34	4.65	4.95	6.17	7.36
900	2.26	2.58	2.90	3.22	3.54	3.86	4.17	4.49	4.81	5.12	6.37	7.61
1000	2.51	2.86	3.22	3.57	3.93	4.28	4.63	4.98	5.33	5.68	7.06	8.42
1100	2.75	3.15	3.54	3.93	4.31	4.70	5.09	5.47	5.85	6.24	7.74	9.21
1160	2.90	3.32	3.73	4.14	4.55	4.95	5.36	5.76	6.17	6.57	8.15	9.69
1200	3.00	3.43	3.86	4.28	4.70	5.12	5.54	5.96	6.37	6.79	8.42	10.00
1300		3.71	4.17	4.63	5.09	5.54	5.99	6.44	6.89	7.33	9.08	10.77
1400		4.00	4.49	4.98	5.47	5.96	6.44	6.92	7.40	7.88	9.74	11.53
1500		4.28	4.81	5.33	5.85	6.37	6.89	7.40	7.91	8.42	10.39	12.27
1600		4.56	5.12	5.68	6.24	6.79	7.33	7.88	8.42	8.95	11.02	12.99
1700		4.84	5.44	6.03	6.62	7.20	7.78	8.35	8.92	9.48	11.65	13.70
1750		4.98	5.59	6.20	6.80	7.40	8.00	8.58	9.16	9.74	11.96	14.04
1800		5.12	5.75	6.37	6.99	7.61	8.21	8.82	9.41	10.00	12.27	14.38
1900		5.40	6.06	6.72	7.37	8.01	8.65	9.28	9.90	10.51	12.87	15.05
2000		5.68	6.37	7.06	7.74	8.42	9.08	9.74	10.39	11.02	13.46	15.69
2100			6.68	7.40	8.11	8.82	9.51	10.19	10.87	11.53	14.04	16.31
2200			6.99	7.74	8.48	9.21	9.93	10.64	11.34	12.02	14.61	16.91
2300			7.30	8.08	8.85	9.61	10.35	11.09	11.81	12.51	15.16	17.48
2400			7.61	8.42	9.21	10.00	10.77	11.53	12.27	12.99	15.69	18.03
2500			7.91	8.75	9.57	10.39	11.18	11.96	12.72	13.46	16.21	18.54
2600			8.21	9.08	9.93	10.77	11.59	12.39	13.17	13.93	16.71	19.03
2700			8.52	9.41	10.29	11.15	11.99	12.81	13.61	14.38	17.20	19.49
2800			8.82	9.74	10.64	11.53	12.39	13.23	14.04	14.83	17.66	19.92
2900			9.11	10.06	10.99	11.90	12.78	13.64	14.47	15.26	18.11	20.32
3000			9.41	10.39	11.34	12.27	13.17	14.04	14.88	15.69	18.54	20.68
3100			9.71	10.71	11.68	12.63	13.55	14.44	15.29	16.11	18.95	21.01
3200			10.00	11.02	12.02	12.99	13.93	14.83	15.69	16.51	19.34	21.31
3300			10.29	11.34	12.36	13.35	14.30	15.21	16.08	16.91	19.71	21.57
3400			10.58	11.65	12.69	13.70	14.66	15.58	16.46	17.29	20.06	21.79
3500			10.87	11.96	13.02	14.04	15.02	15.95	16.83	17.66	20.38	21.97
3600				12.27	13.35	14.38	15.37	16.31	17.20	18.03	20.68	22.11
3700				12.57	13.67	14.72	15.72	16.66	17.55	18.37	20.96	22.21
3800				12.87	13.98	15.05	16.06	17.01	17.89	18.71	21.21	22.27
3900				13.17	14.30	15.37	16.39	17.34	18.22	19.03	21.44	22.28
4000				13.46	14.61	15.69	16.71	17.66	18.54	19.34	21.64	22.25
4100				13.75	14.91	16.00	17.03	17.98	18.85	19.64	21.82	22.18
4200				14.04	15.21	16.31	17.34	18.29	19.15	19.92	21.97	22.06
4300				14.32	15.50	16.61	17.64	18.59	19.44	20.19	22.09	21.89
4400				14.61	15.80	16.91	17.94	18.87	19.71	20.44	22.18	21.67
4500				14.88	16.08	17.20	18.22	19.15	19.97	20.68	22.24	21.40
4600				15.16	16.36	17.48	18.50	19.42	20.22	20.91	22.28	21.08
4700				15.42	16.64	17.76	18.77	19.68	20.46	21.12	22.28	20.71
4800				15.69	16.91	18.03	19.03	19.92	20.68	21.31	22.25	20.28
4900				15.95	17.17	18.29	19.29	20.16	20.89	21.48	22.19	
5000				16.21	17.43	18.54	19.53	20.38	21.09	21.64	22.10	
5200				16.71	17.94	19.03	19.99	20.80	21.44	21.91	21.82	
5400				17.20	18.42	19.49	20.41	21.17	21.73	22.11	21.40	
5600				17.66	18.87	19.92	20.80	21.48	21.97	22.23	20.84	
5800				18.11	19.30	20.32	21.14	21.75	22.14	22.28	20.13	
6000				18.54	19.71	20.68	21.44	21.97	22.24	22.25		

Table 8-4. Timing Belt Horsepower rating (XH, 22.225mm Pitch Belts)

Unit : HP

RPM of Faster Shaft	Rated Horsepower for small pulley								
	18XH (127.34)	20XH (141.49)	22XH (155.64)	24XH (169.79)	26XH (183.94)	28XH (198.08)	30XH (212.23)	32XH (226.38)	40XH (282.98)
100	0.77	0.86	0.94	1.03	1.11	1.20	1.28	1.37	1.71
200	1.54	1.71	1.88	2.05	2.22	2.39	2.56	2.73	3.41
300	2.31	2.56	2.82	3.07	3.33	3.58	3.84	4.09	5.10
400	3.07	3.41	3.75	4.09	4.43	4.76	5.10	5.43	6.76
480	3.68	4.09	4.49	4.90	5.30	5.70	6.10	6.50	8.07
500	3.84	4.26	4.68	5.10	5.52	5.93	6.35	6.76	8.39
510	3.91	4.34	4.77	5.20	5.63	6.05	6.47	6.89	8.55
570	4.37	4.85	5.33	5.80	6.27	6.74	7.21	7.68	9.50
600	4.60	5.10	5.60	6.10	6.60	7.09	7.58	8.07	9.98
680	5.20	5.77	6.33	6.89	7.45	8.00	8.55	9.09	11.21
700	5.35	5.93	6.51	7.09	7.66	8.23	8.79	9.35	11.51
800	6.10	6.76	7.42	8.07	8.71	9.35	9.98	10.60	12.99
870	6.62	7.33	8.04	8.74	9.43	10.12	10.79	11.45	13.99
900	6.84	7.58	8.31	9.03	9.74	10.44	11.13	11.81	14.40
1000	7.58	8.39	9.19	9.98	10.75	11.51	12.26	12.99	15.74
1100	8.31	9.19	10.05	10.90	11.74	12.55	13.35	14.13	17.00
1160	8.74	9.66	10.57	11.45	12.32	13.16	13.99	14.79	17.71
1200		9.98	10.90	11.81	12.70	13.56	14.40	15.22	18.16
1300		10.75	11.74	12.70	13.64	14.54	15.41	16.25	19.23
1400		11.51	12.55	13.56	14.54	15.48	16.38	17.24	20.18
1500		12.26	13.35	14.40	15.41	16.38	17.30	18.16	21.03
1600		12.99	14.13	15.22	16.25	17.24	18.16	19.02	21.74
1700		13.71	14.88	16.00	17.06	18.05	18.97	19.82	22.33
1750		14.06	15.25	16.38	17.45	18.44	19.35	20.18	22.57
1800			15.61	16.75	17.82	18.81	19.72	20.54	22.77
1900			16.32	17.47	18.55	19.53	20.41	21.18	23.07
2000			17.00	18.16	19.23	20.18	21.03	21.74	23.21
2100			17.65	18.81	19.86	20.79	21.58	22.22	23.18
2200			18.27	19.43	20.45	21.33	22.05	22.61	22.98
2300			18.87	20.00	20.99	21.81	22.45	22.91	22.59
2400			19.43	20.54	21.47	22.22	22.77	23.11	22.02
2500				21.03	21.90	22.57	23.01	23.21	21.25
2600				21.47	22.28	22.84	23.16	23.20	20.27
2800				22.22	22.84	23.17	23.18	22.85	
3000				22.77	23.16	23.18	22.81	22.02	
3200				23.11	23.20	22.85	22.02	20.68	
3400				23.22	22.95	22.15	20.78	18.81	
3500				23.18	22.71	21.66	19.99		
3600				23.08	22.39	21.07	19.07		
3800				22.69	21.50	19.58			
4000				22.02	20.27				
4200				21.07	18.67				
4400				19.82					

Table 8-5. Timing Belt Horsepower rating (XXH, 31.75mm Pitch Belts)

Unit : HP

RPM of Faster Shaft	Rated Horsepower for small pulley							
	18XXH (181.91)	20XXH (202.13)	22XXH (222.34)	24XXH (242.55)	26XXH (262.76)	30XXH (303.19)	34XXH (343.62)	40XXH (404.25)
100	1.35	1.50	1.65	1.80	1.95	2.25	2.54	2.99
200	2.69	2.99	3.29	3.59	3.88	4.48	5.07	5.95
300	4.03	4.48	4.92	5.36	5.80	6.68	7.56	8.85
400	5.36	5.95	6.54	7.12	7.70	8.85	9.98	11.65
480	6.42	7.12	7.82	8.51	9.19	10.55	11.87	13.81
500	6.68	7.41	8.13	8.85	9.56	10.96	12.34	14.33
510	6.81	7.56	8.29	9.02	9.74	11.17	12.57	14.59
570	7.60	8.42	9.23	10.04	10.84	12.41	13.93	16.12
600	7.99	8.85	9.70	10.55	11.38	13.01	14.59	16.86
680	9.02	9.98	10.94	11.87	12.80	14.59	16.32	18.75
700	9.28	10.27	11.24	12.20	13.15	14.98	16.74	19.20
800	10.55	11.65	12.74	13.81	14.85	16.86	18.75	21.32
870	11.42	12.61	13.77	14.90	16.01	18.11	20.06	22.65
900	11.79	13.01	14.20	15.36	16.49	18.63	20.60	23.19
1000	13.01	14.33	15.62	16.86	18.05	20.29	22.28	24.78
1100	14.20	15.62	16.98	18.29	19.53	21.81	23.78	26.05
1160	14.90	16.37	17.77	19.11	20.37	22.65	24.57	26.66
1200		16.86	18.29	19.64	20.91	23.19	25.06	26.99
1300		18.05	19.53	20.91	22.19	24.41	26.11	27.55
1400		19.20	20.70	22.10	23.36	25.46	26.91	27.71
1500		20.29	21.81	23.19	24.41	26.32	27.45	27.43
1600		21.32	22.83	24.18	25.33	26.99	27.70	26.69
1700		22.28	23.78	25.06	26.11	27.45	27.64	25.44
1750		22.74	24.21	25.46	26.45	27.60	27.49	24.63
1800		23.19	21.63	25.83	26.75	27.68	27.26	23.67
1900		24.02	25.39	26.47	27.23	27.68	26.53	
2000		24.78	26.05	26.99	27.55	27.43	25.44	
2100		25.46	26.61	27.38	27.70	26.92	23.97	
2200		26.05	27.06	27.62	27.67	26.13		
2300		26.57	27.40	27.71	27.46	25.05		
2400		26.99	27.62	27.65	27.04	23.67		
2500		27.32	27.71	27.43	26.42			
2600		27.55	27.67	27.04	25.59			
2800		27.71	27.19	25.73	23.25			
3000		27.43	26.13	23.67				

V-Ribbed Belts

Before designing a V-Ribbed Belt Drive, you need to know the following drive requirement.

1. Horsepower requirement of the drive
2. The RPM of the driver machine
3. The RPM of the driven machine or speed ratio
4. The approximate center distance for the drive
5. Hours per day operation and type of driven machine

Step 1. Find the Design Horsepower

Design Horsepower = Horsepower × (Service factor + Idler service factor)

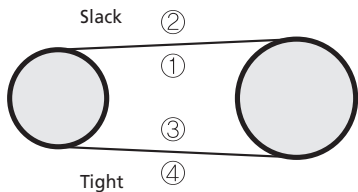
- To calculate the design power it is necessary to determine the service factor for the drive. Using the service factor **Table.1**, determine the type of driven machine.
- Using the service factor chart, determine the service factor for the driven machine the type of operational service.
- Multiply the power requirement of the drive by the service factor you have selected. This gives you the design power for use in designing condition.

Table 1. Service Factors for V-Ribbed Belt Drives

Types of Driven Machines	Types of Driving Unit					
	AC Motors : Normal Torque, Squirrel Cage, Synchronous, Split Phase.			AC motors : high torque, high slip, repulsion Induction, single phase, series wound, slip ring.		
	DC Motors : Shunt Wound Engines: Multiple Cylinder Internal Combustion			DC Motors : Series Wound, Compound Wound Engines: Single cylinder internal combustion. Line shafts. Clutches.		
	Intermittent Service	Normal Service	Continuous Service	Intermittent Service	Normal Service	Continuous Service
	3-8 Hours Daily or Seasonal	8-16 Hours Daily	16-24 Hours Daily	3-8 Hours Daily or Seasonal	8-16 Hours Daily	8-16 Hours Daily
The driven machines listed below are representative samples only. Selected a driven machine whose load characteristics most closely approximate those of the machine being considered.						
Agitators for Liquids Blowers & Exhausters Centrifugal Pumps & Compressors Fans up to 7.5kw / Light Duty Conveyors	1.0	1.1	1.2	1.1	1.2	1.3
Belt Conveyors for Sand, Grain, etc. Dough Mixers / Fans over 7.5kw Generators / Line Shafts Laundry Machinery / Machine Tools Punches-Presses-Shears Printing Machinery Positive Displacement Rotary Pumps Revolving and Vibrating Screens	1.1	1.2	1.3	1.2	1.3	1.4
Brick Machinery / Bucket Elevators Exciters / Piston Compressors Conveyors(Drag-Pan-Screw) Hammer Mills / Paper Mill Beaters Piston Pumps Positive Displacement Blowers Pulverizers Saw Mill and Woodworking Machinery Textile Machinery	1.2	1.3	1.4	1.4	1.5	1.6
Crushers(Gyratory-Jaw-Roll) Mills(Ball-Rod-Tube) / Hoists Rubber Calenders-Extruders-Mills	1.3	1.4	1.5	1.5	1.6	1.8

Table 2. Idler Service Factor

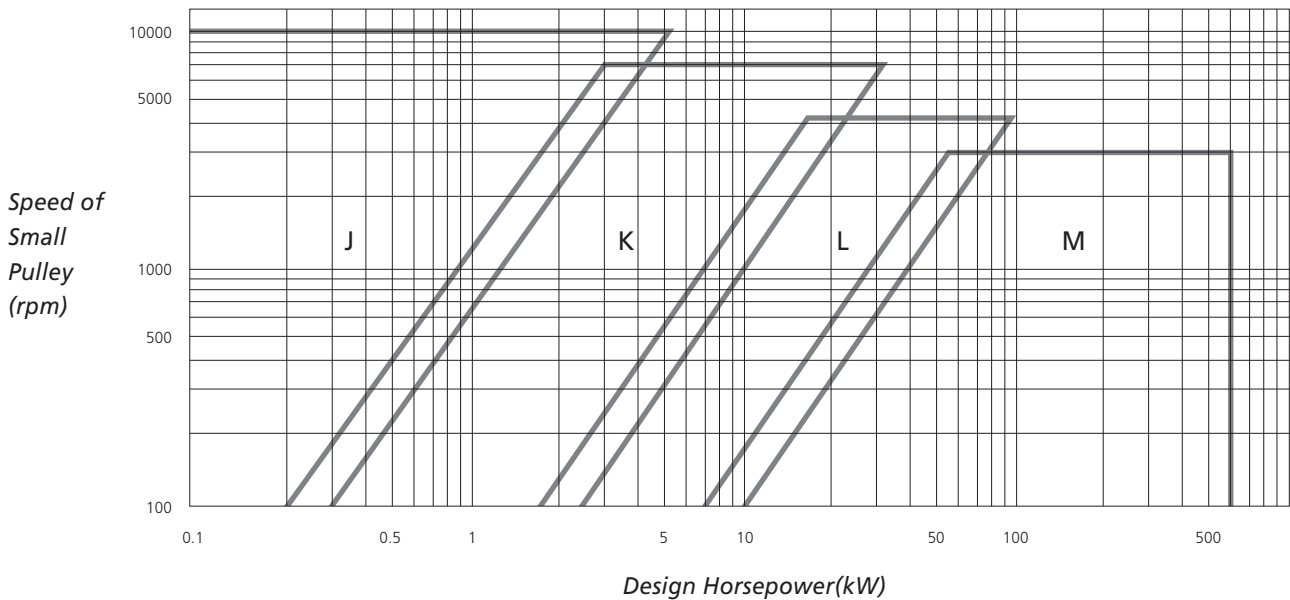
Idler Position	Service Factor
① Inside of Slack Side	0.0
② Outside of Slack Side	0.1
③ Inside of Tight Side	0.1
④ Outside of Tight Side	0.2



Step 2. Select the Proper V-ribbed Belt Section

Use the chart(Figure 1) as a guide to the V-ribbed belt cross section to use for any combination of design power and speed of the faster shaft.

Figure 1. Cross Section Selection Chart



Step 3. Select the Pulley Combination, Belt Length and Center Distance

1. Select the minimum and recommended diameter of small pulley.

Table 3 shows the diameters of available minimum and recommended pulleys for each cross section. From table select a driver pitch diameter and calculate the driven pitch diameter using the following formula

Table 3. Effective Diameter of Small Pulley

Belt Type	J	K	L	M
Minimum Pulley diameter(mm)	25.0	50.0	80.0	180.0
Recommended Pulley diameter(mm)	31.5	56.0	90.0	200.0

2. Selection of large pulley

Calculate the diameter of large pulley using the diameter of small pulley selected.

$$D_p = \frac{n_1}{n_2} \times d_p$$

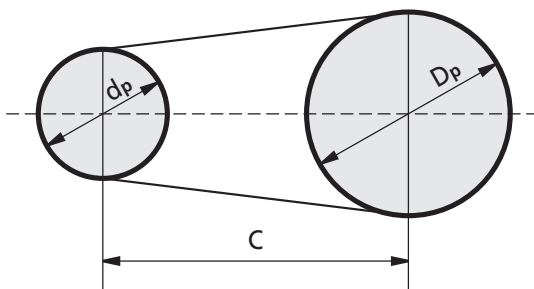
$$\text{Speed Ratio} = \frac{n_1}{n_2}$$

Where d_p : The pitch diameter for small pulley
 D_p : The pitch diameter for large pulley
 n_1 : Revolution of small pulley(rpm)
 n_2 : Revolution of large pulley(rpm)

3. Effective belt length, center distance

A. Calculate center distance using the following formula

$$L_p = 2C + 1.57(D_p + d_p) + \frac{(D_p - d_p)^2}{4C}$$



B. Using **Table 4** select the standard effective belt length

Table 4-1. Standard Effective Length in mm

Standard Effective Belt Length			
J	K	L	M
455	600	1270	2290
485	615	1370	2390
510	630	1420	2510
560	650	1560	2690
610	690	1615	2830
660	710	1665	2920
710	730	1715	3010
760	750	1765	3120
815	775	1840	3330
865	800	1945	3530
915	825	1980	3730
965	850	2020	4090
1015	875	2070	4190
1090	900	2130	4470
1170	925	2200	4650
1245	950	2320	5030
1320	975	2480	5410
1400	1000	2510	6120
1475	1030	2710	6500
1550	1060	2840	6880
1650	1090	2920	7650
1855	1120	3090	8410
2210	1150	3120	9170
2340	1180	3290	-
2490	1220	3330	-
-	1250	3700	-
-	1280	-	-
-	1320	-	-
-	1360	-	-
-	1400	-	-
-	1500	-	-
-	1550	-	-
-	1600	-	-
-	1650	-	-
-	1700	-	-
-	1750	-	-
-	1850	-	-
-	1900	-	-
-	2000	-	-
-	2120	-	-
-	2240	-	-
-	2360	-	-
-	2500	-	-
-	2650	-	-
-	2800	-	-

Table 4-2. Standard Effective Length in inch

Standard Effective Belt Length			
J	K	L	M
18.0	23.5	50.0	90.0
19.0	24.0	54.0	94.0
20.0	25.0	56.0	99.0
22.0	25.5	61.5	106.0
24.0	27.0	63.5	111.5
26.0	28.0	65.5	115.0
28.0	29.0	67.5	118.5
30.0	29.5	69.5	123.0
32.0	30.5	72.5	131.0
34.0	31.5	76.5	139.0
36.0	32.5	78.0	147.0
38.0	33.5	79.5	161.0
40.0	34.5	81.5	165.0
43.0	35.5	84.0	176.0
46.0	36.5	86.5	183.0
49.0	37.5	91.5	198.0
52.0	38.5	97.5	213.0
55.0	39.5	99.0	241.0
58.0	40.5	106.5	256.0
61.0	42.0	112.0	271.0
65.0	43.0	115.0	301.0
73.0	44.0	121.5	331.0
87.0	45.0	123.0	361.0
92.0	46.5	129.5	-
98.0	48.0	131.0	-
-	49.0	145.5	-
-	50.5	-	-
-	52.0	-	-
-	53.5	-	-
-	55.0	-	-
-	59.0	-	-
-	61.0	-	-
-	63.0	-	-
-	65.0	-	-
-	67.0	-	-
-	69.0	-	-
-	73.0	-	-
-	75.0	-	-
-	79.0	-	-
-	83.5	-	-
-	88.0	-	-
-	93.0	-	-
-	98.5	-	-
-	104.5	-	-
-	110.0	-	-

* Conversion of metric sizes to inch sizes. For example : PJ660 = 260J

C. Calculate center distance

$$C = \frac{K + \sqrt{K^2 - 32(D_p - d_p)^2}}{16}$$

Where $K = 4L_p - 6.28(D_p + d_p)$
 L_p : Effective belt length(mm)
 C : Approximate center distance(mm)
 D_p : The pitch diameter of large pulley
 d_p : The pitch diameter of small pulley

Step 4. Basic Horsepower Rating

Select basic horsepower rating per rib using Table 9.

Step 5. Calculate the Number of Belt Ribs

1. Basic horsepower rating

Select basic horsepower rating per rib using Table 8.

2. Calculation of belt ribs

From the Table 5, Table 6 select arc of contact correction factor and length correction factor.

And divide design horsepower in Step 1 by corrected horsepower to calculate the number of belt ribs.

$$N = \frac{P_d}{P_r \cdot K_\theta \cdot K_l}$$

Where N : Number of ribs(EA)
 P_d : Design power(kW)
 P_r : Basic power rating per rib(kW/Rib)
 K_θ : Arc of contact correction factor
 K_l : Length correction factor

Table 5. Arc of Contact Correction Factor, K_θ

$\frac{(D_n - D_r)}{C}$	Arc of Contact on the Small Pulley	Correction Factor	$\frac{(D_n - D_r)}{C}$	Arc of Contact on the Small Pulley	Correction Factor
0.00	180	1.00	0.80	133	0.87
0.10	174	0.99	0.90	127	0.85
0.20	169	0.97	1.00	120	0.82
0.30	163	0.96	1.10	113	0.80
0.40	157	0.94	1.20	106	0.77
0.50	151	0.93	1.30	99	0.73
0.60	145	0.91	1.40	91	0.70
0.70	139	0.89	1.50	83	0.65

Table 6. Length Correction Factor, K_L

Standard Length Designation	Cross Section				Standard Length Designation	Cross Section			
	J	K	L	M		J	K	L	M
455	0.83	-	-	-	1550	1.09	1.02	0.93	0.78
510	0.85	-	-	-	1755	1.12	1.05	0.96	0.80
610	0.89	0.81	-	-	1980	1.16	1.08	0.98	0.82
710	0.92	0.84	-	-	2310	1.18	1.11	1.02	0.88
815	0.95	0.88	0.78	-	2390	1.19	1.12	1.02	0.89
915	0.98	0.91	0.81	-	2510	1.20	1.14	1.04	0.90
1015	1.00	0.93	0.83	-	2690	-	1.15	1.05	0.91
1120	1.02	0.96	0.86	-	2920	-	1.20	1.07	0.93
1270	1.05	0.98	0.89	0.73	3050	-	-	1.08	0.94
1400	1.07	1.00	0.91	0.75	4100	-	-	-	1.00

Power Rating(kW)

Cross Section	Formula
J	$P_r = d_{pr} \left[4.402 \times 10^3 - \frac{0.06390}{d_p} - 9.892 \times 10^{-10}(d_{pr})^2 - 6.056 \times 10^{-4} \log(d_{pr}) \right] + 0.06390r \left(1 - \frac{1}{K_{SR}}\right)$
K	$P_r = d_{pr} \left[0.11596 - \frac{0.4719}{d_p} - 2.7600 \times 10^{-9}(d_{pr})^2 - 2.145 \times 10^{-3} \log(d_{pr}) \right] + 0.4719r \left(1 - \frac{1}{K_{SR}}\right)$
L	$P_r = d_{pr} \left[0.02012 - \frac{0.6618}{d_p} - 4.531 \times 10^{-9}(d_{pr})^2 - 2.685 \times 10^{-3} \log(d_{pr}) \right] + 0.6618r \left(1 - \frac{1}{K_{SR}}\right)$
M	$P_r = d_{pr} \left[0.06716 - \frac{4.581}{d_p} - 1.779 \times 10^{-8}(d_{pr})^2 - 8.565 \times 10^{-3} \log(d_{pr}) \right] + 4.581r \left(1 - \frac{1}{K_{SR}}\right)$

Where P_r : The maximum power rating(kW) per rib recommended at 180° arc of contact for a belt of average length. For other lengths and arcs of contact the Power Rating obtained from the formula must be multiplied by the appropriate correction factors for length and arc of contact as found in Table 7.
 d_p : Pitch diameter of the small pulley(mm)
 r : RPM of the faster shaft/1000
 K_{SR} : Speed ratio factor(See Table 7)

Table 7. Speed Ratio Factors, K_{SR}

Speed Ratio Range D_p/d_p	Factor K_{SR}
1.00 to and including 1.01	1.0000
Over 1.01 to and including 1.03	1.0102
Over 1.03 to and including 1.06	1.0207
Over 1.06 to and including 1.09	1.0313
Over 1.09 to and including 1.13	1.0422
Over 1.13 to and including 1.18	1.0533
Over 1.18 to and including 1.24	1.0647
Over 1.24 to and including 1.35	1.0763
Over 1.35 to and including 1.56	1.0882
Over 1.56	1.1003

D_p : Pitch diameter of large pulley(mm)

Table 8-1. Horsepower Rating for J Section V-ribbed Belts

Unit : kW

RPM of Faster Shaft	Rated HP per Rib for Small Pulley Outside diameter. mm															Additional HP per Rib for Speed Ratio									
	25	28	31.5	40	50	56	63	71	80	100	125	160	200	250	315	1.00 ~1.01	1.02 ~1.04	1.05 ~1.08	1.09 ~1.12	1.13 ~1.18	1.19 ~1.24	1.25 ~1.34	1.35 ~1.51	1.52 ~1.99	above 2.00
690	0.02	0.03	0.03	0.05	0.08	0.09	0.10	0.12	0.14	0.18	0.23	0.30	0.38	0.48	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
725	0.02	0.03	0.04	0.06	0.08	0.09	0.11	0.13	0.15	0.19	0.24	0.32	0.40	0.50	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
870	0.02	0.03	0.04	0.07	0.09	0.11	0.13	0.15	0.17	0.22	0.29	0.37	0.47	0.58	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
950	0.02	0.03	0.04	0.07	0.10	0.12	0.14	0.16	0.19	0.24	0.31	0.40	0.51	0.63	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
1160	0.03	0.04	0.05	0.08	0.12	0.14	0.16	0.19	0.22	0.29	0.37	0.48	0.60	0.75	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
1425	0.03	0.05	0.06	0.10	0.14	0.17	0.20	0.23	0.27	0.35	0.44	0.58	0.72	0.88	1.07	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
1750	0.04	0.05	0.07	0.12	0.17	0.20	0.24	0.28	0.32	0.42	0.53	0.68	0.85	1.03	1.23	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
2850	0.05	0.08	0.11	0.18	0.26	0.30	0.36	0.42	0.48	0.63	0.79	1.00	1.19	1.37	1.45	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02
3450	0.06	0.09	0.12	0.21	0.30	0.36	0.42	0.49	0.57	0.73	0.91	1.13	1.31	1.41		0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03
100	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.04	0.05	0.07	0.08	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200	0.01	0.01	0.01	0.02	0.03	0.03	0.03	0.04	0.05	0.06	0.08	0.10	0.12	0.16	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300	0.01	0.01	0.02	0.03	0.04	0.04	0.05	0.06	0.07	0.09	0.11	0.14	0.18	0.23	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400	0.01	0.02	0.02	0.03	0.05	0.05	0.06	0.07	0.09	0.11	0.14	0.19	0.23	0.29	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500	0.01	0.02	0.03	0.04	0.06	0.07	0.08	0.09	0.11	0.14	0.17	0.23	0.29	0.36	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
600	0.02	0.02	0.03	0.05	0.07	0.08	0.09	0.11	0.12	0.16	0.21	0.27	0.34	0.42	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
700	0.02	0.03	0.03	0.05	0.08	0.09	0.11	0.12	0.14	0.18	0.24	0.31	0.39	0.48	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
800	0.02	0.03	0.04	0.06	0.09	0.10	0.12	0.14	0.16	0.21	0.27	0.35	0.44	0.54	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
900	0.02	0.03	0.04	0.07	0.10	0.11	0.13	0.15	0.18	0.23	0.30	0.39	0.48	0.60	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
1000	0.02	0.03	0.05	0.07	0.10	0.12	0.14	0.17	0.20	0.25	0.33	0.42	0.53	0.66	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
1100	0.03	0.04	0.05	0.08	0.11	0.13	0.16	0.18	0.21	0.28	0.35	0.46	0.58	0.71	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
1200	0.03	0.04	0.05	0.09	0.12	0.14	0.17	0.20	0.23	0.30	0.38	0.50	0.62	0.77	0.94	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
1300	0.03	0.04	0.06	0.09	0.13	0.15	0.18	0.21	0.25	0.32	0.41	0.53	0.66	0.82	1.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
1400	0.03	0.05	0.06	0.10	0.14	0.17	0.19	0.23	0.26	0.34	0.44	0.57	0.71	0.87	1.06	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
1500	0.03	0.05	0.06	0.10	0.15	0.18	0.21	0.24	0.28	0.36	0.46	0.60	0.75	0.92	1.11	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
1600	0.03	0.05	0.07	0.11	0.16	0.19	0.22	0.25	0.30	0.38	0.49	0.63	0.79	0.96	1.16	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
1700	0.04	0.05	0.07	0.11	0.17	0.20	0.23	0.27	0.31	0.41	0.52	0.67	0.83	1.01	1.21	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
1800	0.04	0.05	0.07	0.12	0.17	0.21	0.24	0.28	0.33	0.43	0.54	0.70	0.87	1.05	1.26	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
1900	0.04	0.06	0.08	0.13	0.18	0.22	0.25	0.30	0.34	0.45	0.57	0.73	0.90	1.09	1.29	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
2000	0.04	0.06	0.08	0.13	0.19	0.22	0.26	0.31	0.36	0.47	0.59	0.76	0.94	1.13	1.33	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02
2200	0.04	0.06	0.09	0.14	0.21	0.24	0.29	0.34	0.39	0.51	0.64	0.82	1.01	1.20	1.39	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.02
2400	0.05	0.07	0.09	0.15	0.22	0.26	0.31	0.36	0.42	0.54	0.69	0.88	1.07	1.26	1.43	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.02
2600	0.05	0.07	0.10	0.16	0.24	0.28	0.33	0.39	0.45	0.58	0.74	0.93	1.13	1.32	1.45	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02
2800	0.05	0.08	0.10	0.17	0.25	0.30	0.35	0.41	0.48	0.62	0.78	0.98	1.18	1.36	1.45	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02
3000	0.05	0.08	0.11	0.18	0.27	0.32	0.37	0.44	0.51	0.65	0.82	1.03	1.23	1.39	1.43	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
3200	0.05	0.08	0.12	0.19	0.28	0.33	0.39	0.46	0.53	0.69	0.86	1.08	1.27	1.40		0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
3400	0.06	0.09	0.12	0.20	0.30	0.35	0.41	0.48	0.56	0.72	0.90	1.12	1.30	1.41		0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03
3600	0.06	0.09	0.13	0.21	0.31	0.37	0.43	0.51	0.59	0.75	0.94	1.15	1.32	1.40		0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03
3800	0.06	0.09	0.13	0.22	0.32	0.38	0.45	0.53	0.61	0.78	0.97	1.19	1.34	1.38		0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03
4000	0.06	0.10	0.14	0.23	0.34	0.40	0.47	0.55	0.64	0.81	1.00	1.21	1.35			0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03
4500	0.07	0.10	0.15	0.25	0.37	0.44	0.52	0.60	0.69	0.88	1.08	1.27	1.34			0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03
5000	0.07	0.11	0.16	0.27	0.40	0.48	0.56	0.65	0.75	0.94	1.13	1.29				0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.04
5500	0.07	0.12	0.17	0.29	0.43	0.51	0.60	0.70	0.80	0.99	1.17	1.28				0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04
6000	0.08	0.13	0.18	0.31	0.46	0.54	0.64	0.74	0.84	1.03	1.19					0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05
6500	0.08	0.13	0.19	0.33	0.49	0.57	0.67	0.77	0.88	1.07	1.20					0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05
7000	0.08	0.14	0.20	0.35	0.51	0.60	0.70	0.81	0.91	1.09	1.18					0.00	0.01	0.01	0.02	0.02	0.03	0.04	0.04	0.05	0.05
7500	0.08	0.14	0.21	0.36	0.53	0.63	0.73	0.84	0.94	1.10	1.15					0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.04	0.05	0.06
8000	0.08	0.14	0.22	0.38	0.56	0.65	0.76	0.86	0.96	1.10						0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.05	0.06
8500	0.08	0.15	0.22	0.39	0.58	0.67	0.78	0.88	0.97	1.08						0.00	0.01	0.01	0.02	0.03	0.04	0.04	0.05	0.06	0.07
9000	0.08	0.15	0.23	0.41	0.59	0.69	0.80	0.89	0.98	1.06						0.00	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.06	0.07
9500	0.08	0.15	0.24	0.42	0.61	0.71	0.81	0.90	0.98	1.01						0.00	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.07	0.07
10000	0.08	0.16	0.24	0.43	0.62	0.72	0.82	0.91	0.97							0.00	0.01	0.02	0.03	0.03	0.04	0.05			

Table 8-2. Horsepower Rating for K Section V-ribbed Belts

Unit : kW

RPM of Faster Shaft	Rated HP per Rib for Small Pulley Outside diameter. mm																		Additional HP per Rib for Speed Ratio									
	50	56	63	71	80	90	100	112	125	140	160	180	200	224	250	280	315	355	1.00 ~1.01	1.02 ~1.04	1.05 ~1.08	1.09 ~1.12	1.13 ~1.18	1.19 ~1.24	1.25 ~1.34	1.35 ~1.51	1.52 ~1.99	above 2.00
485	0.09	0.12	0.16	0.21	0.26	0.31	0.37	0.43	0.51	0.59	0.69	0.80	0.90	1.03	1.16	1.31	1.48	1.68	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03
575	0.10	0.14	0.19	0.24	0.30	0.36	0.43	0.51	0.59	0.68	0.81	0.93	1.05	1.19	1.35	1.52	1.72	1.95	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03
585	0.10	0.14	0.19	0.24	0.30	0.37	0.43	0.51	0.60	0.69	0.82	0.94	1.07	1.21	1.37	1.55	1.75	1.98	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03
690	0.11	0.16	0.21	0.28	0.35	0.43	0.50	0.59	0.69	0.80	0.95	1.09	1.24	1.40	1.58	1.79	2.02	2.29	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.04
725	0.11	0.17	0.22	0.29	0.36	0.44	0.52	0.62	0.72	0.84	0.99	1.14	1.29	1.47	1.65	1.87	2.11	2.39	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.04
870	0.13	0.19	0.26	0.34	0.42	0.52	0.61	0.73	0.85	0.98	1.16	1.34	1.51	1.72	1.94	2.19	2.47	2.79	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.05
950	0.14	0.20	0.28	0.36	0.46	0.56	0.66	0.78	0.91	1.06	1.26	1.45	1.64	1.86	2.09	2.36	2.66	3.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.04	0.05
1160	0.16	0.24	0.33	0.43	0.54	0.66	0.79	0.93	1.09	1.26	1.49	1.72	1.94	2.20	2.48	2.79	3.14	3.52	0.00	0.01	0.01	0.01	0.02	0.03	0.04	0.04	0.05	0.06
1425	0.18	0.27	0.38	0.50	0.64	0.79	0.93	1.11	1.29	1.50	1.78	2.05	2.31	2.62	2.94	3.29	3.69	4.11	0.00	0.01	0.02	0.03	0.04	0.05	0.05	0.06	0.07	0.08
1750	0.20	0.32	0.45	0.59	0.76	0.93	1.11	1.32	1.54	1.79	2.11	2.43	2.73	3.08	3.44	3.84	4.27	4.70	0.00	0.01	0.02	0.03	0.04	0.06	0.07	0.08	0.09	0.10
2850	0.26	0.44	0.64	0.86	1.11	1.38	1.64	1.94	2.26	2.62	3.07	3.48	3.87	4.28	4.66	5.02	5.30		0.00	0.02	0.04	0.05	0.07	0.09	0.11	0.13	0.14	0.16
3450	0.28	0.49	0.72	0.98	1.27	1.58	1.88	2.23	2.59	2.99	3.47	3.90	4.27	4.64	4.93				0.00	0.02	0.04	0.07	0.09	0.11	0.13	0.15	0.17	0.20
200	0.04	0.06	0.08	0.10	0.12	0.14	0.17	0.20	0.23	0.27	0.31	0.36	0.41	0.46	0.52	0.59	0.67	0.76	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
300	0.06	0.08	0.11	0.14	0.17	0.21	0.24	0.28	0.33	0.38	0.45	0.52	0.59	0.67	0.75	0.85	0.96	1.09	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02
400	0.07	0.10	0.14	0.18	0.22	0.27	0.31	0.37	0.43	0.49	0.58	0.67	0.76	0.86	0.97	1.10	1.25	1.41	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
500	0.09	0.12	0.17	0.21	0.26	0.32	0.38	0.45	0.52	0.60	0.71	0.82	0.93	1.05	1.19	1.35	1.52	1.72	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.03
600	0.10	0.14	0.19	0.25	0.31	0.38	0.44	0.52	0.61	0.71	0.84	0.97	1.09	1.24	1.40	1.58	1.79	2.02	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03
700	0.11	0.16	0.22	0.28	0.35	0.43	0.51	0.60	0.70	0.81	0.96	1.11	1.25	1.42	1.60	1.81	2.05	2.31	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.04
800	0.12	0.18	0.24	0.31	0.39	0.48	0.57	0.67	0.79	0.91	1.08	1.24	1.41	1.60	1.80	2.04	2.30	2.60	0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04
900	0.13	0.19	0.27	0.35	0.44	0.53	0.63	0.75	0.87	1.01	1.20	1.38	1.56	1.77	2.00	2.25	2.54	2.87	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.05	0.05
1000	0.14	0.21	0.29	0.38	0.48	0.58	0.69	0.82	0.95	1.11	1.31	1.51	1.71	1.94	2.19	2.46	2.78	3.13	0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.04	0.05	0.06
1100	0.15	0.23	0.31	0.41	0.52	0.63	0.75	0.89	1.04	1.20	1.43	1.64	1.86	2.11	2.37	2.67	3.01	3.38	0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.06
1200	0.16	0.24	0.33	0.44	0.55	0.68	0.81	0.96	1.12	1.30	1.54	1.77	2.00	2.27	2.55	2.87	3.23	3.61	0.00	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.06	0.07
1300	0.17	0.26	0.36	0.47	0.59	0.73	0.86	1.03	1.20	1.39	1.65	1.89	2.14	2.42	2.73	3.06	3.44	3.84	0.00	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.07	0.07
1400	0.18	0.27	0.38	0.50	0.63	0.78	0.92	1.09	1.27	1.48	1.75	2.02	2.28	2.58	2.89	3.25	3.64	4.06	0.00	0.01	0.02	0.03	0.04	0.04	0.05	0.06	0.07	0.08
1500	0.19	0.28	0.40	0.52	0.67	0.82	0.98	1.16	1.35	1.57	1.86	2.14	2.41	2.73	3.06	3.42	3.83	4.26	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1600	0.19	0.30	0.42	0.55	0.70	0.87	1.03	1.22	1.43	1.66	1.96	2.25	2.54	2.87	3.22	3.60	4.01	4.45	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1700	0.20	0.31	0.44	0.58	0.74	0.91	1.08	1.29	1.50	1.74	2.06	2.37	2.67	3.01	3.37	3.76	4.18	4.62	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.10
1800	0.21	0.32	0.46	0.61	0.77	0.96	1.14	1.35	1.57	1.83	2.16	2.48	2.79	3.15	3.52	3.92	4.34	4.78	0.00	0.01	0.02	0.03	0.05	0.06	0.07	0.08	0.09	0.10
1900	0.21	0.33	0.47	0.63	0.81	1.00	1.19	1.41	1.65	1.91	2.26	2.59	2.91	3.28	3.66	4.06	4.50	4.92	0.00	0.01	0.02	0.04	0.05	0.06	0.07	0.08	0.10	0.11
2000	0.22	0.35	0.49	0.66	0.84	1.04	1.24	1.47	1.72	1.99	2.35	2.70	3.03	3.41	3.79	4.20	4.63	5.05	0.00	0.01	0.03	0.04	0.05	0.06	0.08	0.09	0.10	0.11
2100	0.23	0.36	0.51	0.68	0.87	1.08	1.29	1.53	1.78	2.07	2.44	2.80	3.14	3.53	3.92	4.34	4.76	5.17	0.00	0.01	0.03	0.04	0.05	0.07	0.08	0.09	0.11	0.12
2200	0.23	0.37	0.53	0.71	0.91	1.12	1.34	1.59	1.85	2.15	2.53	2.90	3.25	3.65	4.04	4.46	4.88	5.26	0.00	0.01	0.03	0.04	0.06	0.07	0.08	0.10	0.11	0.13
2300	0.24	0.38	0.55	0.73	0.94	1.16	1.39	1.64	1.92	2.23	2.62	3.00	3.36	3.76	4.16	4.57	5.07	5.34	0.00	0.01	0.03	0.04	0.06	0.07	0.09	0.10	0.12	0.13
2400	0.24	0.39	0.56	0.76	0.97	1.20	1.43	1.70	1.99	2.30	2.71	3.10	3.46	3.87	4.27	4.68	5.14	5.40	0.00	0.02	0.03	0.05	0.06	0.08	0.09	0.11	0.12	0.14
2500	0.25	0.40	0.58	0.78	1.00	1.24	1.48	1.76	2.05	2.38	2.79	3.19	3.56	3.97	4.37	4.77	5.21	5.44	0.00	0.02	0.03	0.05	0.06	0.08	0.09	0.11	0.13	0.14
2600	0.25	0.41	0.60	0.80	1.03	1.28	1.53	1.81	2.11	2.45	2.87	3.28	3.65	4.07	4.46	4.85	5.25	5.46	0.00	0.02	0.03	0.05	0.07	0.08	0.10	0.12	0.13	0.15
2700	0.26	0.42	0.61	0.83	1.06	1.32	1.57	1.87	2.17	2.52	2.95	3.36	3.74	4.16	4.55	4.93	5.28		0.00	0.02	0.03	0.05	0.07	0.09	0.10	0.12	0.14	0.15
2800	0.26	0.43	0.63	0.85	1.09	1.36	1.62	1.92	2.23	2.59	3.03	3.44	3.83	4.24	4.63	4.99	5.30		0.00	0.02	0.04	0.05	0.07	0.09	0.11	0.12	0.14	0.16
2900	0.26	0.44	0.64	0.87	1.12	1.39	1.66	1.97	2.29	2.65	3.10	3.52	3.91	4.32	4.70	5.04	5.30		0.00	0.02	0.04	0.06	0.07	0.09	0.11	0.13	0.15	0.17
3000	0.27	0.45	0.66	0.89	1.15	1.43	1.70	2.02	2.35	2.72	3.18	3.60	3.99	4.39	4.76	5.08			0.00	0.02	0.04	0.06	0.08	0.09	0.11	0.13	0.15	0.17
3200	0.27	0.47	0.69	0.93	1.21	1.50	1.79	2.12	2.46	2.84	3.31	3.74	4.13	4.52	4.86	5.13			0.00	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18
3400	0.28	0.48	0.71	0.97	1.26	1.57	1.87	2.21	2.57	2.96	3.44	3.87	4.25	4.62	4.92	5.12			0.00	0.02	0.04	0.06	0.09	0.11	0.13	0.15	0.17	0.19
3600	0.29	0.50	0.74	1.01	1.31	1.63	1.94	2.30	2.67	3.07	3.55	3.98	4.35	4.69	4.95				0.00	0.02	0.05	0.07	0.09	0.11	0.14	0.16	0.18	0.21
3800	0.29	0.51	0.77	1.05	1.36	1.69	2.02	2.38	2.76	3.17	3.66	4.08	4.42	4.74	4.93				0.00	0.02	0.05	0.07	0.10	0.12	0.14	0.17</		

Table 8-3. Horsepower Rating for L Section V-ribbed Belts

Unit : kW

RPM of Faster Shaft	Rated HP per Rib for Small Pulley Outside diameter. mm											Additional HP per Rib for Speed Ratio									
	80	90	100	125	160	200	250	315	400	500	630	1.00 ~1.01	1.02 ~1.04	1.05 ~1.08	1.09 ~1.12	1.13 ~1.18	1.19 ~1.24	1.25 ~1.34	1.35 ~1.51	1.52 ~1.99	above 2.00
575	0.34	0.42	0.50	0.71	0.98	1.29	1.67	2.14	2.73	3.40	4.20	0.00	0.01	0.01	0.02	0.02	0.03	0.04	0.04	0.05	0.05
690	0.40	0.49	0.59	0.83	1.15	1.52	1.95	2.51	3.19	3.95	4.84	0.00	0.01	0.01	0.02	0.02	0.03	0.04	0.04	0.05	0.06
725	0.41	0.51	0.62	0.86	1.20	1.58	2.04	2.61	3.33	4.11	5.02	0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.05	0.06
870	0.48	0.60	0.72	1.01	1.41	1.85	2.39	3.05	3.86	4.72	5.68	0.00	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.06	0.07
950	0.51	0.65	0.77	1.09	1.52	2.00	2.57	3.28	4.14	5.03	5.98	0.00	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.07	0.08
1160	0.61	0.76	0.92	1.29	1.81	2.37	3.04	3.85	4.79	5.71	6.55	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1425	0.71	0.90	1.09	1.54	2.15	2.81	3.58	4.48	5.47	6.30		0.00	0.01	0.03	0.04	0.05	0.06	0.08	0.09	0.10	0.11
1750	0.84	1.06	1.28	1.82	2.54	3.30	4.16	5.12	6.02			0.00	0.02	0.03	0.05	0.06	0.08	0.09	0.11	0.12	0.14
2850	1.20	1.54	1.86	2.64	3.60	4.53	5.35					0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23
3450	1.37	1.75	2.12	2.98	4.00	4.85						0.00	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.28
100	0.08	0.09	0.11	0.15	0.20	0.27	0.34	0.44	0.57	0.71	0.90	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
200	0.14	0.17	0.20	0.28	0.38	0.50	0.64	0.83	1.07	1.34	1.68	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02
300	0.20	0.24	0.29	0.40	0.55	0.72	0.93	1.20	1.54	1.93	2.42	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
400	0.25	0.31	0.37	0.51	0.71	0.93	1.21	1.55	1.99	2.49	3.11	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03
500	0.30	0.37	0.45	0.62	0.87	1.14	1.47	1.89	2.42	3.02	3.75	0.00	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04
600	0.35	0.44	0.52	0.73	1.02	1.34	1.73	2.22	2.84	3.52	4.35	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05
700	0.40	0.50	0.60	0.84	1.17	1.53	1.98	2.54	3.23	3.99	4.89	0.00	0.01	0.01	0.02	0.02	0.03	0.04	0.04	0.05	0.06
800	0.45	0.56	0.67	0.94	1.31	1.72	2.22	2.84	3.61	4.43	5.37	0.00	0.01	0.01	0.02	0.03	0.04	0.04	0.05	0.06	0.06
900	0.49	0.62	0.74	1.04	1.45	1.91	2.46	3.14	3.97	4.84	5.79	0.00	0.01	0.02	0.02	0.03	0.04	0.05	0.06	0.06	0.07
1000	0.54	0.67	0.81	1.14	1.59	2.09	2.69	3.42	4.30	5.21	6.15	0.00	0.01	0.02	0.03	0.04	0.04	0.05	0.06	0.07	0.08
1100	0.58	0.73	0.88	1.24	1.73	2.27	2.91	3.69	4.62	5.54	6.42	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1200	0.62	0.78	0.94	1.33	1.86	2.44	3.12	3.95	4.91	5.82	6.62	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.09	0.10
1300	0.66	0.84	1.01	1.43	1.99	2.61	3.33	4.20	5.17	6.06	6.72	0.00	0.01	0.02	0.03	0.05	0.06	0.07	0.08	0.09	0.10
1400	0.70	0.89	1.07	1.52	2.12	2.77	3.53	4.43	5.41	6.26		0.00	0.01	0.02	0.04	0.05	0.06	0.07	0.09	0.10	0.11
1500	0.74	0.94	1.13	1.61	2.24	2.93	3.72	4.64	5.63	6.40		0.00	0.01	0.03	0.04	0.05	0.07	0.08	0.09	0.11	0.12
1600	0.78	0.99	1.19	1.69	2.36	3.08	3.90	4.84	5.81	6.48		0.00	0.01	0.03	0.04	0.06	0.07	0.09	0.10	0.11	0.13
1700	0.82	1.04	1.25	1.78	2.48	3.23	4.08	5.03	5.96	6.51		0.00	0.02	0.03	0.05	0.06	0.08	0.09	0.11	0.12	0.14
1800	0.86	1.09	1.31	1.86	2.59	3.37	4.24	5.20	6.08			0.00	0.02	0.03	0.05	0.06	0.08	0.10	0.11	0.13	0.14
1900	0.89	1.14	1.37	1.95	2.71	3.51	4.40	5.35	6.17			0.00	0.02	0.03	0.05	0.07	0.08	0.10	0.12	0.13	0.15
2000	0.93	1.18	1.43	2.03	2.81	3.64	4.55	5.48	6.22			0.00	0.02	0.04	0.05	0.07	0.09	0.11	0.12	0.14	0.16
2100	0.97	1.23	1.48	2.10	2.92	3.77	4.68	5.60	6.23			0.00	0.02	0.04	0.06	0.07	0.09	0.11	0.13	0.15	0.17
2200	1.00	1.27	1.54	2.18	3.02	3.89	4.81	5.69				0.00	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18
2300	1.03	1.32	1.59	2.26	3.12	4.00	4.92	5.77				0.00	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18
2400	1.07	1.36	1.64	2.33	3.22	4.11	5.03	5.82				0.00	0.02	0.04	0.06	0.09	0.11	0.13	0.15	0.17	0.19
2500	1.10	1.40	1.70	2.40	3.31	4.22	5.12	5.85				0.00	0.02	0.04	0.07	0.09	0.11	0.13	0.16	0.18	0.20
2600	1.13	1.44	1.74	2.47	3.40	4.31	5.20	5.86				0.00	0.02	0.05	0.07	0.09	0.12	0.14	0.16	0.18	0.21
2700	1.16	1.48	1.79	2.54	3.48	4.40	5.27	5.85				0.00	0.02	0.05	0.07	0.10	0.12	0.14	0.17	0.19	0.22
2800	1.19	1.52	1.84	2.60	3.56	4.49	5.33					0.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.20	0.22
2900	1.22	1.56	1.89	2.67	3.64	4.56	5.37					0.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.21	0.23
3000	1.25	1.60	1.93	2.73	3.72	4.63	5.40					0.00	0.03	0.05	0.08	0.11	0.13	0.16	0.19	0.21	0.24
3100	1.27	1.63	1.98	2.79	3.79	4.69	5.42					0.00	0.03	0.06	0.08	0.11	0.14	0.17	0.19	0.22	0.25
3200	1.30	1.67	2.02	2.85	3.85	4.75	5.42					0.00	0.03	0.06	0.09	0.11	0.14	0.17	0.20	0.23	0.26
3300	1.33	1.70	2.06	2.90	3.91	4.80	5.41					0.00	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.23	0.26
3400	1.35	1.73	2.10	2.95	3.97	4.84	5.38					0.00	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27
3500	1.38	1.77	2.14	3.00	4.02	4.87						0.00	0.03	0.06	0.09	0.12	0.16	0.19	0.22	0.25	0.28
3600	1.40	1.80	2.18	3.05	4.07	4.89						0.00	0.03	0.06	0.10	0.13	0.16	0.19	0.22	0.26	0.29
3700	1.43	1.83	2.21	3.10	4.12	4.90						0.00	0.03	0.07	0.10	0.13	0.16	0.20	0.23	0.26	0.30
3800	1.45	1.86	2.25	3.14	4.16	4.91						0.00	0.03	0.07	0.10	0.13	0.17	0.20	0.24	0.27	0.30
3900	1.47	1.89	2.28	3.18	4.19	4.91						0.00	0.03	0.07	0.10	0.14	0.17	0.21	0.24	0.28	0.31
4000	1.49	1.91	2.32	3.22	4.22	4.89						0.00	0.04	0.07	0.11	0.14	0.18	0.21	0.25	0.28	0.32
4100	1.51	1.94	2.35	3.26	4.24	4.87						0.00	0.04	0.07	0.11	0.15	0.18	0.22	0.25	0.29	0.33
4200	1.53	1.97	2.38	3.29	4.26	4.84						0.00	0.04	0.07	0.11	0.15	0.19	0.22	0.26	0.30	0.34
4300	1.55	1.99	2.41	3.32	4.28							0.00	0.04	0.08	0.11	0.15	0.19	0.23	0.27	0.31	0.34
4400	1.57	2.01	2.43	3.35	4.29							0.00	0.04	0.08	0.12	0.16	0.20	0.23	0.27	0.31	0.35
4500	1.58	2.03	2.46	3.38	4.29							0.00	0.04	0.08	0.12	0.16	0.20	0.24	0.28	0.32	0.36
4600	1.60	2.05	2.48	3.40	4.29							0.00	0.04	0.08	0.12	0.16	0.20	0.24	0.29	0.33	0.37
4700	1.61	2.07	2.50	3.42	4.29							0.00	0.04	0.08	0.13	0.17	0.21	0.25	0.29	0.33	0.38
4800	1.63	2.09	2.52	3.44	4.27							0.00	0.04	0.09	0.13	0.17	0.21	0.26	0.30	0.34	0.38
4900	1.64	2.11	2.54	3.46	4.26							0.00	0.04	0.09	0.13	0.17	0.22	0.26	0.30	0.35	0.39
5000	1.65	2.13	2.56	3.47	4.23							0.00	0.04	0.09	0.13	0.18	0.22	0.27	0.31	0.36	0.40

Table 8-4. Horsepower Rating for M Section V-ribbed Belts

Unit : kW

RPM of Faster Shaft	Rated HP per Rib for Small Pulley Outside diameter. mm											Additional HP per Rib for Speed Ratio									
	180	200	224	250	280	315	355	400	450	500	560	1.00 ~1.01	1.02 ~1.04	1.05 ~1.08	1.09 ~1.12	1.13 ~1.18	1.19 ~1.24	1.25 ~1.34	1.35 ~1.51	1.52 ~1.99	above 2.00
435	1.87	2.28	2.76	3.27	3.86	4.54	5.30	6.14	7.06	7.96	9.01	0.00	0.03	0.06	0.08	0.11	0.14	0.17	0.20	0.23	0.25
485	2.05	2.49	3.03	3.59	4.24	4.99	5.82	6.74	7.75	8.73	9.87	0.00	0.03	0.06	0.09	0.13	0.16	0.19	0.22	0.25	0.28
575	2.36	2.88	3.50	4.16	4.91	5.77	6.73	7.79	8.93	10.04	11.33	0.00	0.04	0.07	0.11	0.15	0.19	0.22	0.26	0.30	0.34
585	2.39	2.92	3.55	4.22	4.98	5.85	6.83	7.90	9.06	10.18	11.48	0.00	0.04	0.08	0.11	0.15	0.19	0.23	0.27	0.30	0.34
690	2.73	3.34	4.07	4.84	5.72	6.72	7.83	9.04	10.35	11.59	13.02	0.00	0.04	0.09	0.13	0.18	0.22	0.27	0.31	0.36	0.40
725	2.84	3.48	4.24	5.04	5.96	7.00	8.15	9.41	10.75	12.03	13.49	0.00	0.05	0.09	0.14	0.19	0.24	0.28	0.33	0.38	0.42
870	3.28	4.03	4.91	5.85	6.90	8.10	9.41	10.83	12.31	13.70	15.23	0.00	0.06	0.11	0.17	0.23	0.28	0.34	0.40	0.45	0.51
950	3.52	4.32	5.27	6.27	7.40	8.67	10.06	11.54	13.08	14.50	16.02	0.00	0.06	0.12	0.19	0.25	0.31	0.37	0.43	0.49	0.56
1160	4.09	5.03	6.14	7.30	8.59	10.02	11.56	13.16	14.75	16.13	17.47	0.00	0.08	0.15	0.23	0.30	0.38	0.45	0.53	0.60	0.68
1425	4.72	5.82	7.10	8.42	9.87	11.43	13.04	14.62	16.05	17.09		0.00	0.09	0.19	0.28	0.37	0.46	0.56	0.65	0.74	0.83
1750	5.37	6.63	8.06	9.51	11.04	12.61	14.11	15.36				0.00	0.11	0.23	0.34	0.46	0.57	0.68	0.80	0.91	1.02
2850	6.32	7.71	9.08	10.18								0.00	0.19	0.37	0.56	0.74	0.93	1.11	1.30	1.48	1.67
3450	5.85	6.98										0.00	0.22	0.45	0.67	0.90	1.12	1.35	1.57	1.80	2.02
100	0.53	0.64	0.76	0.89	1.05	1.23	1.43	1.65	1.90	2.14	2.43	0.00	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.05	0.06
200	0.97	1.17	1.40	1.66	1.95	2.29	2.67	3.09	3.55	4.02	4.56	0.00	0.01	0.03	0.04	0.05	0.07	0.08	0.09	0.10	0.12
300	1.37	1.66	2.00	2.37	2.79	3.28	3.83	4.44	5.10	5.76	6.54	0.00	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18
400	1.74	2.12	2.57	3.04	3.59	4.22	4.93	5.71	6.57	7.41	8.39	0.00	0.03	0.05	0.08	0.10	0.13	0.16	0.18	0.21	0.23
500	2.10	2.56	3.11	3.69	4.35	5.12	5.98	6.92	7.95	8.95	10.12	0.00	0.03	0.07	0.10	0.13	0.16	0.20	0.23	0.26	0.29
600	2.44	2.98	3.62	4.31	5.09	5.98	6.97	8.07	9.25	10.39	11.71	0.00	0.04	0.08	0.12	0.16	0.20	0.23	0.27	0.31	0.35
700	2.76	3.38	4.12	4.90	5.79	6.80	7.92	9.15	10.46	11.72	13.15	0.00	0.05	0.09	0.14	0.18	0.23	0.27	0.32	0.36	0.41
800	3.08	3.77	4.59	5.47	6.45	7.58	8.82	10.16	11.58	12.93	14.43	0.00	0.05	0.10	0.16	0.21	0.26	0.31	0.36	0.42	0.47
900	3.37	4.14	5.05	6.01	7.09	8.31	9.66	11.10	12.61	14.01	15.54	0.00	0.06	0.12	0.18	0.23	0.29	0.35	0.41	0.47	0.53
1000	3.66	4.50	5.48	6.53	7.69	9.01	10.44	11.96	13.52	14.95	16.45	0.00	0.07	0.13	0.20	0.26	0.33	0.39	0.46	0.52	0.59
1100	3.93	4.84	5.90	7.02	8.26	9.66	11.16	12.74	14.33	15.73	17.16	0.00	0.07	0.14	0.21	0.29	0.36	0.43	0.50	0.57	0.64
1200	4.19	5.16	6.29	7.48	8.80	10.26	11.82	13.43	15.01	16.36	17.64	0.00	0.08	0.16	0.23	0.31	0.39	0.47	0.55	0.62	0.70
1300	4.43	5.46	6.67	7.92	9.30	10.81	12.41	14.02	15.56	16.80	17.88	0.00	0.08	0.17	0.25	0.34	0.42	0.51	0.59	0.68	0.76
1400	4.67	5.75	7.02	8.33	9.76	11.31	12.93	14.51	15.97	17.06		0.00	0.09	0.18	0.27	0.36	0.46	0.55	0.64	0.73	0.82
1500	4.88	6.03	7.34	8.70	10.18	11.76	13.37	14.90	16.23	17.12		0.00	0.10	0.20	0.29	0.39	0.49	0.59	0.68	0.78	0.88
1600	5.09	6.28	7.65	9.05	10.55	12.14	13.73	15.17	16.33			0.00	0.10	0.21	0.31	0.42	0.52	0.62	0.73	0.83	0.94
1700	5.28	6.52	7.93	9.36	10.89	12.47	14.00	15.33				0.00	0.11	0.22	0.33	0.44	0.55	0.66	0.77	0.88	1.00
1800	5.46	6.73	8.18	9.64	11.17	12.73	14.19	15.36				0.00	0.12	0.23	0.35	0.47	0.59	0.70	0.82	0.94	1.05
1900	5.62	6.93	8.41	9.89	11.41	12.93	14.28	15.26				0.00	0.12	0.25	0.37	0.49	0.62	0.74	0.87	0.99	1.11
2000	5.76	7.11	8.61	10.10	11.60	13.06	14.28					0.00	0.13	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.17
2100	5.89	7.27	8.79	10.27	11.74	13.11	14.17					0.00	0.14	0.27	0.41	0.55	0.68	0.82	0.96	1.09	1.23
2200	6.01	7.40	8.93	10.40	11.82	13.09						0.00	0.14	0.29	0.43	0.57	0.72	0.86	1.00	1.15	1.29
2300	6.10	7.51	9.04	10.49	11.85	12.99						0.00	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35
2400	6.18	7.60	9.13	10.53	11.82	12.81						0.00	0.16	0.31	0.47	0.62	0.78	0.94	1.09	1.25	1.41
2500	6.25	7.67	9.18	10.54	11.72							0.00	0.16	0.33	0.49	0.65	0.81	0.98	1.14	1.30	1.46
2600	6.29	7.71	9.19	10.50	11.57							0.00	0.17	0.34	0.51	0.68	0.85	1.01	1.18	1.35	1.52
2700	6.32	7.73	9.18	10.41	11.35							0.00	0.18	0.35	0.53	0.70	0.88	1.05	1.23	1.41	1.58
2800	6.32	7.72	9.12	10.27								0.00	0.18	0.36	0.55	0.73	0.91	1.09	1.28	1.46	1.64
2900	6.31	7.69	9.03	10.08								0.00	0.19	0.38	0.57	0.75	0.94	1.13	1.32	1.51	1.70
3000	6.27	7.62	8.91	9.84								0.00	0.20	0.39	0.59	0.78	0.98	1.17	1.37	1.56	1.76
3100	6.22	7.53	8.74									0.00	0.20	0.40	0.60	0.81	1.01	1.21	1.41	1.61	1.82
3200	6.14	7.41	8.53									0.00	0.21	0.42	0.62	0.83	1.04	1.25	1.46	1.67	1.87
3300	6.04	7.26	8.29									0.00	0.21	0.43	0.64	0.86	1.07	1.29	1.50	1.72	1.93
3400	5.92	7.08	8.00									0.00	0.22	0.44	0.66	0.88	1.11	1.33	1.55	1.77	1.99
3500	5.78	6.87										0.00	0.23	0.46	0.68	0.91	1.14	1.37	1.59	1.82	2.05
3600	5.61	6.63										0.00	0.23	0.47	0.70	0.94	1.17	1.41	1.64	1.87	2.11
3700	5.42	6.36										0.00	0.24	0.48	0.72	0.96	1.20	1.44	1.68	1.93	2.17
3800	5.20	6.05										0.00	0.25	0.50	0.74	0.99	1.24	1.48	1.73	1.98	2.23

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