



Belt transmissions - V-belts [in]

i Calculation without errors.

Pulley 1

Pulley 2

Pulley 3

ii Project information

?

V-Belts, 3 Pulleys

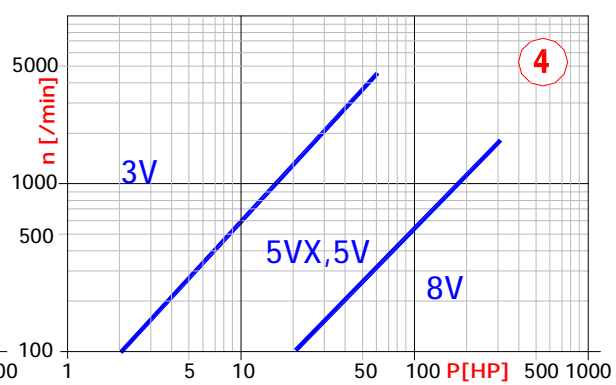
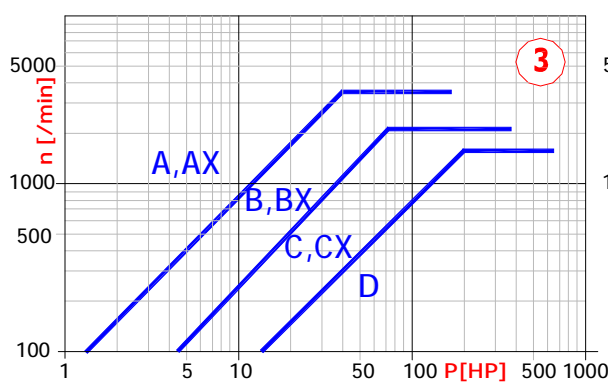
1.0 Manner of loading, operational parameters

1.1 Transferred power / power distributed to pulleys	P	100	89.44000244	5.00	[HP]
1.2 Speed of pulleys	n	2000.0	850.0	2000.0	[rpm]
1.3 Transmission ratio	i		2.353	1.000	
1.4 Torque	Mk	262.60	552.63	13.13	[lb.ft]
1.5 Type of driving units (loading)		A...Continuous or light shocks			▼
1.6 Types of driven machine (loading)		A...Light duty			▼
1.7 Daily loading of the transmission		A...Less then 8 hours			▼
1.8 Belt slip coefficient		0.89	0.89	<input checked="" type="checkbox"/>	[%]
1.9 Transmission efficiency		94	94.4	<input checked="" type="checkbox"/>	[%]
1.10 Automatic design - press the button					

2.0 Design of geometry and number of belts

2.1 Recommended type of V-belt

n = 2000; P = 100



2.2 V-Belt type / Optimization

2.3 Table Pitch diameter (outer) selection

2.4 Calculating diameter of the pulley

2.5 Recommended axis distance (min-max)

2.6 Axis distance between pulleys (C12, C23, C31)

2.7 Length of the belt - Calculated/Min./Standardized

2.8 The angle between the pulleys (α_1 , α_2 , α_3)

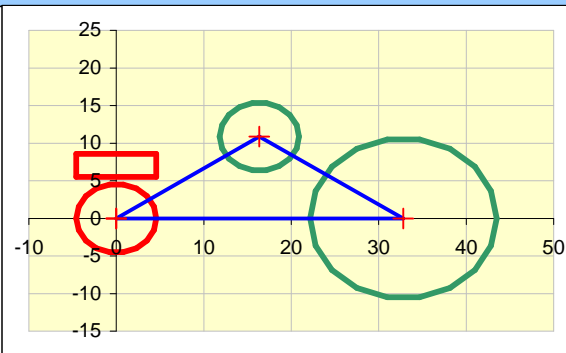
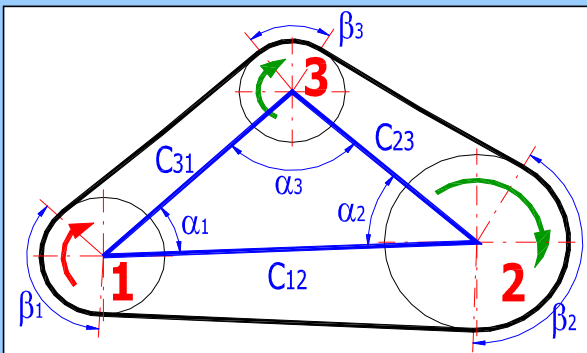
2.9 The angle of wrapping of the pulley (β_1 , β_2 , β_3)

2.10 Power transferred by one belt to a pulley

2.11 Calculated (exact) number of belts

2.12 Necessary number of belts / approximate weight

	3...5V - ANSI/RMA IP22			
	7 (7.1)	7 (7.1)	7 (7.1)	[in]
Dp	9.15	21.34	9.07	[in]
C	15.9 - 76.2	15.8 - 76	9.5 - 45.5	[in]
C	32.82	19.73	19.63	[in]
Lw	118.00	> 89	118 (1180)	[in]
α	33.61	33.41	112.98	[°]
β	135.80	175.41	48.79	[°]
PR	26.21	29.51	13.18	[HP]
k	3.82	3.03	0.38	
	4	140.47		[lb]



3.0 Results, coefficients

3.1 Coefficients

3.2 - Coefficient of wrapping angle

3.3 - Coefficient of operational loading

3.4 - Coefficient of belth length

3.5 Axis distance adjustability

3.6 - For tightening of the belt

c1	0.88	0.99	0.44
c2	1		
c3	0.99		
	c12	c23	c31
x	2.04	1.89	4.57

[in]

3.7 - For easier installation of the belt

3.8 **Force conditions, speed**

3.9 - Coefficient of safety

3.10 - Belt speed / max. for the given type

3.11 - Bending frequency of the belt

3.12 - Tensile force

3.13 - Centrifugal force

3.14 - Prestressing of the belt

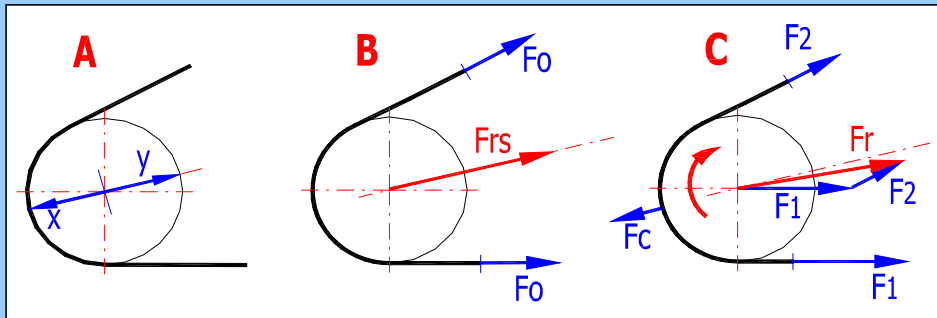
3.15 - Static force on the shaft (at rest)

3.16 - Force in the loaded belt strand

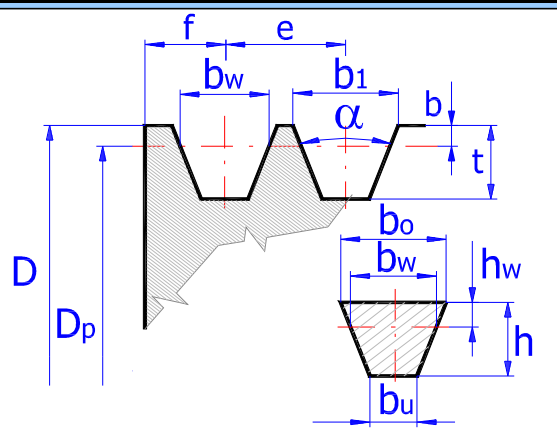
3.17 - Force in the unloaded belt strand

3.18 - Total radial force on the shaft (bearings)

y	1.32	1.40	1.98	[in]
	1.1	1.1	<input checked="" type="checkbox"/>	
v	4790.58	< 8000		[ft/min]
fs	24			[/s]
Fu	688.85	616.11	34.44	[lb]
Fc	135.05			[lb]
Fo	698.18	567.67	201.52	[lb]
Frs	1293.77	1395.24	576.72	[lb]
F1	1042.61	1006.24	715.40	[lb]
F2	353.76	390.13	680.96	[lb]
Fr	1319.47	1395.46	577.58	[lb]



4.0 **Pulley and belts dimensions**



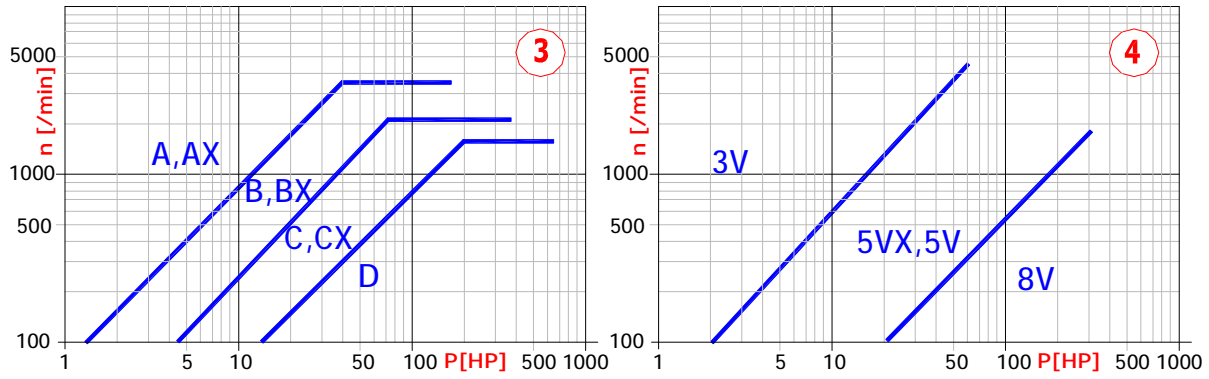
bw	-			[in]
bo	0.625	Belt dimensions		[in]
bu	-			[in]
h	0.53125			[in]
hw	-			[in]
D	9.25	21.44	9.17	[in]
Dp	9.15	21.34	9.07	[in]
α	38	42	38	[°]
b1	0.6	Pulley dimensions		[in]
f	0.5			[in]
e	0.688			[in]
b	0.05			[in]
t	0.59			[in]
w	3.064	Pulley width		[in]

5.0 Manner of loading, operational parameters

5.1 Transferred power / power distributed to pulleys	P	130	111.38		[HP]
5.2 Speed of pulleys	n	1500.0	890.0		[rpm]
5.3 Transmission ratio	i		1.685		
5.4 Torque	Mk	455.17	657.29		[lb.ft]
5.5 Type of driving units (loading)		B...Moderate shocks		▼	
5.6 Types of driven machine (loading)		B...Medium duty		▼	
5.7 Daily loading of the transmission		B...Over 8 - less than 16 hours		▼	
5.8 Belt slip coefficient		0.68	0.68	<input checked="" type="checkbox"/>	[%]
5.9 Transmission efficiency		85.7	85.7	<input checked="" type="checkbox"/>	[%]
5.10 Automatic design - press the button					

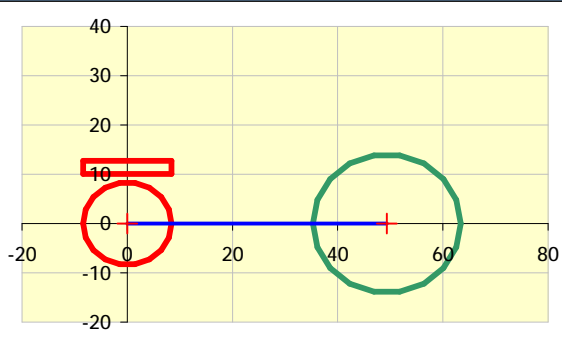
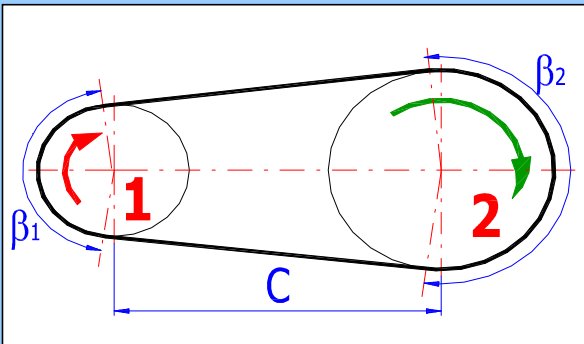
6.0 Design of geometry and number of belts

6.1 Recommended type of V-belt n = 1500; P = 130



- 6.2 V-Belt type / Optimization
- 6.3 Table Pitch diameter (outer) selection
- 6.4 Calculating diameter of the pulley
- 6.5 Axis distance / optimum value / min-max
- 6.6 Length of the belt - Calculated/Min./Standardized
- 6.7 The angle of wrapping of the pulley (b1, b2, b3)
- 6.8 Power transferred by one belt to a pulley
- 6.9 Calculated (exact) number of belts
- 6.10 Necessary number of belts / approximate weight

	4...8V - ANSI/RMA IP22		▼
	16.8 (17)	12.3 (12.5)	▼
Dp	16.8	28.1	[in]
c12	49.34	44.9	27 - 89.8 [in]
Lw	169.90	> 125.8	170 (1700) [in]
β	166.82	193.18	[°]
PR	68.00	72.14	[HP]
k	1.91	1.54	
k/m	2	175.12	[lb]



7.0 Results, coefficients

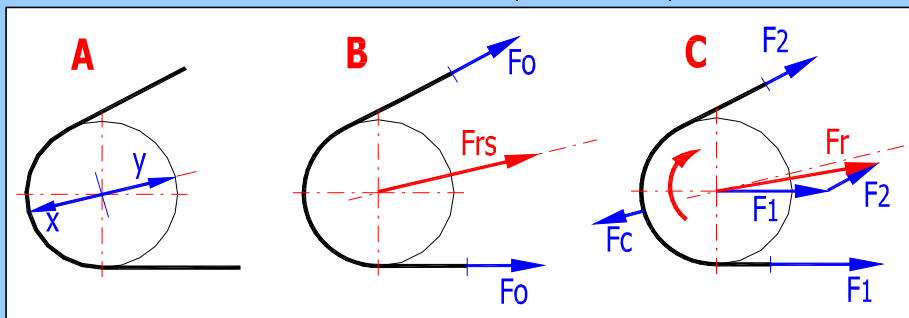
7.1 Coefficients

7.2 - Coefficient of wrapping angle	c1	0.97	1.03	
7.3 - Coefficient of operational loading	c2	1.3		
7.4 - Coefficient of belth length	c3	0.94		
7.5 Axis distance adjustability				
7.6 - For tightening of the belt	x	2.57		[in]
7.7 - For easier installation of the belt	y	2.14		[in]
7.8 Force conditions, speed				
7.9 - Coefficient of safety		1.200	1.20	<input checked="" type="checkbox"/>
7.10 - Belt speed / max. for the given type	v	6596.86	< 8000	[ft/min]
7.11 - Bending frequency of the belt	fs	23		[/s]
7.12 - Tensile force	Fu	650.31		[lb]

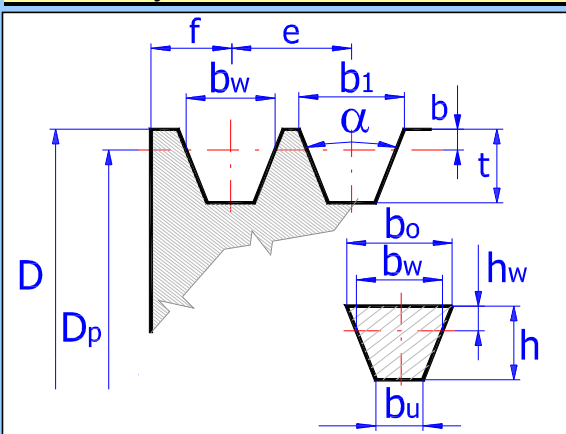
- 7.13 - Centrifugal force
- 7.14 - Prestressing of the belt
- 7.15 - Static force on the shaft (at rest)
- 7.16 - Force in the loaded belt strand
- 7.17 - Force in the unloaded belt strand
- 7.18 - Total radial force on the shaft (bearings)

Fc	335.45
Fo	836.03
Frs	1661.01
F1	1161.18
F2	510.87
Fr	1662.69

- [lb]
- [lb]
- [lb]
- [lb]
- [lb]
- [lb]



8.0 Pulley and belts dimensions



bw	-	Belt dimensions	[in]
bo	1		[in]
bu	-		[in]
h	0.875		[in]
hw	-		[in]
D	17.00	28.32	[in]
Dp	16.80	28.12	[in]
alpha	40	42	[°]
b1	1	Pulley dimensions	[in]
f	0.75		[in]
e	1.125		[in]
b	0.1		[in]
t	0.99		[in]
w	2.625	Pulley width	[in]

9.0 Graphical output, CAD systems

- 9.1 Output of 2D drawing to: AutoCAD LT xx
- 9.2 Scale of 2D drawing: Automatic
- 9.3 Use the data from calculation of: Of two pulleys
- 9.4 Detail: Pulley 1

a [°]

9.5 Text description (Information for BOM)

- Row 1 (BOM attribute 1)
- Row 2 (BOM attribute 2)
- Row 3 (BOM attribute 3)

Pulley 1

Pulley 8V

Dp=16.8; k=2

ANSI/RMA IP22

- Row 1 (BOM attribute 1)
- Row 2 (BOM attribute 2)
- Row 3 (BOM attribute 3)

Pulley 2

Pulley 8V

Dp=28.12; k=2

ANSI/RMA IP22

- Row 1 (BOM attribute 1)
- Row 2 (BOM attribute 2)
- Row 3 (BOM attribute 3)

Pulley 3

Pulley 5V

Dp=9.07; k=4

ANSI/RMA IP22

- Row 1 (BOM attribute 1)
- Row 2 (BOM attribute 2)
- Row 3 (BOM attribute 3)

Belt

Belt 8V

Lw=169.9; k=2

ANSI/RMA IP22