



Drive Characteristics

-	Motor specifications	
Pm	installed Power	kW
Nm	motor speed	rpm
-	shaft diameter	mm
-	driver machine	
Pa	power to transmit	kW
Nr	speed of driven machine	U/min
-	shaft diameter of driven machine	mm
E	shaft distance	mm
-	working time	h/day
-	stretch system	
-	special conditions	

<p><u>Example</u></p> <p>Electric motor with cage roller short circuit starting 5.5 KW 1450 rpm 38 mm</p> <p>Centrifugal fan 4 KW 2200 rpm 40 mm 610 mm 24 h/day</p> <p>Motor on motor slides</p>

Factors of corrected power

K1	-	Corrected power following the application
K2	-	Corrected power following the use
K3	-	Corrected power following the speed (in case of multiply drive only)

Determination of K1 :

Use the below table, following the motor type and the driven machine

DRIVEN MACHINES	MOTOR								
	Electric motor with very low starting torque (momentary over load 149% of the nominal load). Example motor with roller cage, motor with continuous current, internal combustion motor (8 cylinders)			Alternating current motor (or triphased motor) with standard starting torque (tempory overload : 150 to 249% of the nominal load). Example : motor with roller cage (short circuit starting), synchro motor (standard torque) direct current motor, internal combustion motor (6 cylinders)			Alternating current (or triphased motor) with an high starting torque (momentary overload : 250 to 400% of the nominal load). Example : monophased motors, motor with high starting torque (cd/cn ≥2), direct current motor (in serial) ; internal combustion motor (4 cylinders) ; hydraulic motors ; shaft lines.		
	Working time (in hours) per day								
	<6	6<=16	>16	<6	6<=16	>16	<6	6<=16	>16
- Office material : typing machine and calculator - Camcorder - Domestic machines : mixers, centrifugals, meters	1.0	1.2	1.4	1.2	1.4	1.6	1.4	1.6	1.8
- Wood machines : saws, twisting machines, planing machines - Printing machines - Paper machines : mixers, dryers, calanders	1.2	1.4	1.6	1.4	1.6	1.8	1.6	1.8	2.0
- Machine tools : drilling machines, twisting machines, planing machines... - Textiles machines - Fans and compressors (blower) up to 10 kW; - Mixer and machines, dryers - Cutting presses, presses, mowers	1.3	1.5	1.7	1.5	1.7	1.9	1.7	1.9	2.1
- Paper machines - Rubber machines - Lifting machines - Pneumatic machines - Moulded machines - Crushers	1.4	1.6	1.8	1.6	1.8	2	1.8	2.0	2.2





K2 factor determination :

Use the following table to select K2.

Stretching roller position	K2 value
Internal on driven belt	0
External on driven belt	0.1
Internal on driven belt	0.1
External on driven belt	0.2

With no stretching roller
K2 = 0

K3 factor determination :

(only for multiple drives)

Drive ratio	K3 value
Nr / Nm = 1 to 1,24	kein
Nr / Nm = 1,25 to 1,75	0,10
Nr / Nm = 1,76 to 2,49	0,20
Nr / Nm = 2,50 to 3,49	0,30
Nr / Nm = 3,50 and beyond	0,40

The transmission is multiplying
Nr/Nm = 2200/1450 = 1.51
K3 = 0.10

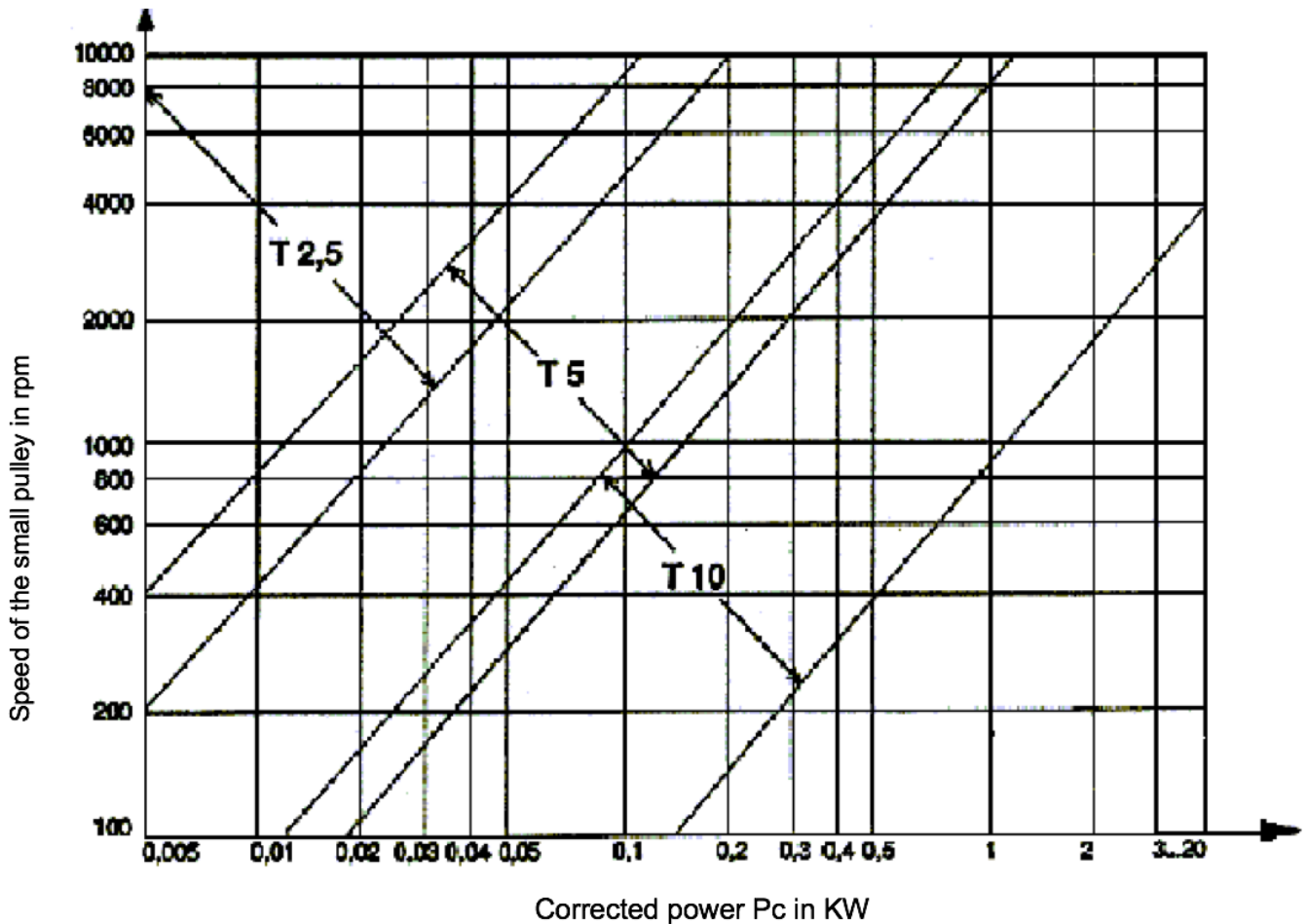
Corrected power Pc

Can be calculated in multiplying Pa by the corrected factors.

$P_c = P_a \times (K_1 + K_2 + K_3)$

Belt pitch

Use the below diagramme. Find the pitch in using the corrected power and the speed of the small pulley.





Selection of pulleys

The table below gives the minimum of teeth of the pulley according to the speed and the pitch.

Table with 4 columns: Speed of the small pulley in rpm, Mini number of teeth (n1 T2.5, n1 T5, n1 T10). Rows include speed ranges from <900 to >3600 rpm.

We are : Small pulley n1 mini: 20 teeth Big pulley n2: 20*1.51 = 30 teeth The pulleys 20 and 30 teeth T10 are standard.

Belt length

- Select the length belt in using the pitch ø of the pulleys and center distance E req

L = 2 E + (3.14(D+d) / 2) + ((D-d)^2 / 4E)

D : Pitch diameter of the big pulley d : Pitch diameter of the small pulley

Length L: L = 2*610 + (3.14*(95.49+63.66)) / 2 + ((95.49-63.66)^2 / (4*610)) L = 1470.28

- Choose in the table the closer belt length calculate the exact center distance E' :

E' = E - (L - Lp) / 2 if Lp < L and E' = E + (Lp - L) / 2 if Lp > L

Belt T10 Length Lp 1460

Lp < L E' = 610 - (1470.28-1460) / 2 = 604.86.

Belt width

- in the table of transmission power (FT 12006-4, 5), Calculate number of teeth engaged (n) :

n = (0.5 - (Dp - dp) / 6E') * n1

n1 : Number of teeth of small pulley E' : Exact centre distance

- Determinate on the following table the engaging factor F1 :

F1 = 1

Pt = 1.044 KW

n = (0.5 - (96.49-63.66) / (6*594.86)) * 20 n = 9.82

Table with 6 columns: Number of teeth engaged (≥ 6, 5, 4, 3, 2) and Engaging factor F1 (1, 0,8, 0,6, 0,4, 0,2)



Calculate the faktor of Belt width F2

F2 =

$$F2 = (6 \cdot 8) / (10 \cdot 1.044 \cdot 1) = 4.59.$$

T 2.5		T 5, T 10	
F2	Width (mm)	F2	Width (mm)
<=0.28	6	<=0.28	4
0.29...0.50	8	0.29...0.50	6
0.51...0.72	10	0.51...0.72	8
0.73...1.00	12	0.73...1.00	10
1.01...1.27	16	1.01...1.27	12
1.28...1.75	20	1.28...1.75	16
1.76...2.84	25	1.76...2.23	20
2.85...3.69	32	2.24...2.84	25
-	-	2.85...3.69	32
-	-	3.70...5.86	50

Please check :

- The pulleys can accept the shaft ϕ .
- The width belt is lower than the small pulleys.

Pitch T 2,5 – Transmissible power per 10 mm belt width and 6 engaged teeth (KW)

Speed of the small pulley in rpm	Number of teeth – Pitchdiameter of the small pulley (mm)											
	12	14	16	18	20	22	24	26	28	30	34	40
	9.55	11.14	12.73	14.32	15.92	17.51	19.1	20.69	22.28	23.87	27.06	31.83
200	4.62	5.25	6.09	6.72	7.56	8.40	9.03	9.87	10.50	10.50	12.81	15.12
400	9.03	10.50	12.18	13.65	15.12	16.59	18.06	19.53	21.21	22.68	25.62	30.24
600	13.65	15.50	18.06	20.37	22.68	24.99	27.09	29.40	31.71	34.02	38.43	45.36
800	18.06	21.21	24.15	27.09	30.24	33.18	36.33	39.27	42.21	45.36	51.24	60.27
1000	22.58	26.46	30.24	34.02	37.80	41.58	45.36	49.14	52.92	56.49	64.05	75.39
1200	27.09	31.71	36.33	40.74	45.36	49.77	54.39	58.80	63.42	67.83	76.86	90.51
1400	31.71	36.96	42.21	47.46	52.92	58.17	63.42	68.67	73.92	79.17	89.67	105.42
1600	36.33	42.21	48.30	54.39	60.48	66.36	72.45	78.33	84.42	90.51	102.48	120.33
1800	40.74	47.46	54.39	61.11	67.83	74.76	81.48	88.20	94.92	101.64	115.29	135.45
2000	45.36	52.92	60.27	67.83	75.39	82.95	90.51	97.86	105.42	112.98	127.89	150.15
2200	49.77	58.17	66.36	74.55	82.95	91.14	99.54	113.14	115.92	124.11	140.70	165.06
2400	54.39	63.42	71.82	81.48	90.51	99.54	108.36	117.39	126.42	135.24	153.30	179.97
2600	58.80	68.67	78.33	88.20	98.07	107.73	117.39	127.05	136.92	146.58	165.90	194.67
2800	63.42	73.92	84.42	94.92	105.42	115.92	126.42	132.30	147.21	157.71	178.50	209.37
3000	67.83	79.17	90.51	101.64	112.98	124.11	135.45	146.58	157.71	168.84	190.89	223.86
3500		92.40	105.42	118.44	131.67	144.69	157.71	170.73	183.54	196.35	222.18	260.19
4000		105.42	120.33	135.24	150.36	165.06	179.97	194.67	209.37	223.86	253.05	295.89
4500		118.44	135.24	152.04	168.84	185.43	202.02	218.40	234.78	251.16	283.50	330.96
5000		131.88	150.15	168.84	187.32	205.59	223.86	242.13	260.19	278.04	313.53	365.40
5500		144.69	165.06	185.43	205.80	225.75	245.70	265.44	285.18	304.71	343.14	399.21
6000		157.71	179.76	201.81	224.07	245.70	267.33	288.75	309.96	329.21	372.33	431.97
7000			209.37	234.78	260.19	285.18	309.96	334.53	357.00	382.21	428.82	495.18
8000			238.35	267.33	295.89	324.03	351.75	379.05	405.72	431.97	483.00	554.40
9000			267.33	299.25	330.96	362.04	392.49	422.31	451.50	479.85	534.24	608.79
10000			295.89	330.75	365.61	399.21	432.18	464.10	495.18	525.21	582.12	657.93



Use the transmission only if a diminution of life time is admissible.



Pitch T 5 – Transmissible power per 10 mm belt width and 6 engaged teeth (KW)

Speed of the small pulley in rpm	Number of teeth – Pitchdiameter of the small pulley (mm)									
	12	14	16	18	20	22	24	26	28	30
	19.1	22.28	25.46	28.65	31.83	35.01	38.2	41.38	44.56	47.75
200	0.024	0.024	0.036	0.036	0.036	0.048	0.048	0.060	0.060	0.060
400	0.048	0.060	0.072	0.072	0.084	0.084	0.096	0.096	0.108	0.108
600	0.072	0.084	0.096	0.108	0.120	0.120	0.132	0.144	0.156	0.168
800	0.096	0.108	0.120	0.132	0.144	0.156	0.168	0.180	0.204	0.216
1000	0.108	0.120	0.132	0.156	0.168	0.192	0.204	0.228	0.240	0.264
1200	0.120	0.144	0.156	0.180	0.204	0.216	0.240	0.264	0.288	0.300
1400	0.132	0.156	0.180	0.204	0.228	0.252	0.276	0.300	0.324	0.348
1600	0.156	0.180	0.204	0.288	0.252	0.276	0.300	0.324	0.348	0.384
1800	0.168	0.192	0.216	0.252	0.276	0.300	0.336	0.360	0.384	0.420
2000	0.180	0.204	0.240	0.264	0.300	0.324	0.360	0.396	0.420	0.444
2200	0.192	0.228	0.252	0.288	0.324	0.348	0.384	0.420	0.444	0.480
2400	0.204	0.240	0.276	0.312	0.348	0.372	0.408	0.444	0.480	0.516
2600	0.216	0.252	0.288	0.324	0.360	0.396	0.432	0.480	0.516	0.552
2800	0.228	0.264	0.312	0.348	0.384	0.420	0.456	0.504	0.540	0.576
3000	0.240	0.276	0.324	0.360	0.396	0.444	0.480	0.528	0.564	0.600
3500	0.264	0.312	0.348	0.396	0.444	0.480	0.528	0.576	0.624	0.672
4000	0.288	0.348	0.384	0.444	0.480	0.540	0.588	0.636	0.684	0.732
4500	0.312	0.372	0.420	0.480	0.588	0.588	0.636	0.684	0.744	0.804
5000	0.336	0.396	0.456	0.516	0.564	0.624	0.684	0.732	0.792	0.852
5500			0.480	0.540	0.600	0.660	0.720	0.780	0.840	0.900
6000			0.504	0.564	0.624	0.684	0.756	0.816	0.876	0.948
7000			0.552	0.624	0.684	0.756	0.828	0.888	0.948	1.020
8000				0.660	0.732	0.816	0.888	0.948	1.020	1.104
9000				0.696	0.780	0.852	0.924	0.996	1.080	1.164
10000				0.756	0.828	0.912	0.996	1.080	1.164	1.248



Use the transmission only if a diminution of life time is admissible.

Pitch T 10 – Transmissible power per 10 mm belt width and 6 engaged teeth KW)





Speed Of the small pulley in rpm	Number of teeth – Pitchdiameter of the small pulley (mm)											
	12	14	16	18	20	22	24	26	28	30	34	40
	38.2	44.56	50.93	57.3	63.66	70.03	76.39	82.76	89.12	95.49	114.59	127.32
100	0.048	0.048	0.060	0.060	0.072	0.084	0.084	0.096	0.096	0.108	0.132	0.144
200	0.084	0.096	0.108	0.120	0.144	0.156	0.168	0.180	0.192	0.204	0.252	0.276
300	0.120	0.144	0.156	0.180	0.204	0.216	0.240	0.264	0.288	0.300	0.360	0.396
400	0.150	0.180	0.204	0.228	0.252	0.288	0.312	0.336	0.360	0.384	0.468	0.516
500	0.180	0.216	0.240	0.276	0.300	0.324	0.360	0.384	0.420	0.456	0.540	0.600
600	0.216	0.252	0.288	0.324	0.372	0.408	0.444	0.480	0.516	0.552	0.660	0.732
700	0.252	0.288	0.336	0.384	0.420	0.456	0.504	0.552	0.588	0.624	0.756	0.840
800	0.288	0.324	0.384	0.420	0.480	0.516	0.564	0.624	0.660	0.708	0.852	0.948
900	0.312	0.360	0.420	0.468	0.528	0.576	0.624	0.672	0.720	0.780	0.936	1.032
1000	0.336	0.396	0.465	0.504	0.564	0.624	0.672	0.732	0.780	0.852	1.020	1.116
1200	0.396	0.456	0.528	0.588	0.660	0.720	0.780	0.852	0.912	0.984	1.188	1.320
1400	0.444	0.516	0.588	0.672	0.744	0.816	0.888	0.960	1.044	1.116	1.332	1.488
1600	0.492	0.576	0.660	0.744	0.828	0.912	0.984	1.080	1.152	1.236	1.488	1.644
1800	0.540	0.636	0.720	0.816	0.900	0.996	1.080	1.176	1.260	1.356	1.620	1.812
2000	0.588	0.684	0.780	0.876	0.972	1.068	1.164	1.260	1.356	1.452	1.740	1.932
2200	0.624	0.732	0.828	0.936	1.044	1.152	1.248	1.356	1.464	1.560	1.884	2.088
2400	0.672	0.780	0.888	1.008	1.116	1.224	1.344	1.452	1.560	1.680	2.016	2.232
2600	0.720	0.828	0.948	1.068	1.118	1.308	1.416	1.548	1.656	1.788	2.136	2.376
2800	0.756	0.876	0.996	1.128	1.248	1.380	1.500	1.620	1.752	1.884	2.244	2.508
3000		0.912	1.056	1.188	1.320	1.452	1.668	1.704	1.836	1.968	2.364	2.628
3500		1.020	1.152	1.308	1.452	1.596	1.740	1.884	2.028	2.172	2.616	2.892
4000			1.260	1.428	1.584	1.740	1.908	2.052	2.220	2.376	2.844	3.186
4500			1.380	1.560	1.728	1.896	2.076	2.244	2.424	2.592	3.108	3.456
5000			1.476	1.656	1.848	2.028	2.208	2.304	2.580	2.760	3.312	3.684
6000			1.632	1.848	2.052	2.244	2.448	2.652	2.856	3.072	3.684	4.092



Use the transmission only if a diminution of life time is admissible.

