[Technical Data]
Selection of Transmission Timing Belts 1

Selection is easy with Timing Pulleys and Belts automatic calculation tool available at:
http://fawos.misumi.jp/FA_WEB/pulley_sea/

[Step 1] Setting the Required Design Conditions

(1) Machine Type (2) Power Transmission (3) Load Variances (4) Operation Duration per Day (5) Small Pulley Rotational Speed
(6) Rotation Ratio (Lg. Pulley # of Teeth / Small Pulley # of Teeth) (7) Shaft Center Distance (Interim) (8) Pulley Diameter Limitation (9) Other Usage Conditions

[Step 2-a] Calculating Design Power……MXL/XL/L/H/S_M/MTS_M/T Series

•Design Power (Pd) =Transmission Power (Pt) x Overload Factor (Ks)
· Calculate Transmission Power at Motor Rated Power Output. (It is ideal to calculate from the actual load applied to the belt.)
· Overload Factor (Ks)=Ko+Kr+Ki
Overload Factor (Ks)=Lo+Kr+Ki

Ko : Overload Correction Factor (Table 1)
Kr : Rotation Ratio Correction Factor (Table 2)
Ki : Idler Correction Factor (Table 3)

* When converting the torque (Tq) into transmission power (Pd), calculate the applicable values by using the following expressions.
Torque (Tq) = tqxKs
Transmitting Power (Pd) = Tqxn/9550

Tq : Design Torque (N·m)
tq : Transmission Torque
Ks : Overload Factor
Pd : Design Power (kW)
n : Speed (rpm)

i. If the maximum torque is used once or twice per day,
calculate the design power by assigning "the load correction factor (Ko) = 1.0" to the expression for the overload factor and then, by multiplying the maximum torque by the overload factor (Ks) derived from the said expression.

ii. If the maximum torque is used very often,
calculate the design power by multiplying the maximum torque by the applicable overload factor (Ks).

<For Timing Belts based on Spindle Motor>
Calculate the design power by calculating the transmission power from the basic rotation speed and then, by multiplying it by the applicable overload factor (Ks).

<For Timing Belts based on Linear Drive>
Calculate the design power by using the following expressions.
Te=m×α
Pt=TexV/1000
Pd=PtxKs

Te : Effective Tension (N)
m : Mass (g)
α : Acceleration (m/sec^2)
V : Belt Speed (m/sec)
Pt : Transmission Power (KW)
Pd : Design Power (kW)
Ks : Overload Factor

Table 1. Load Correction Factor (Ko)

Typical Machines Using a Belt	Motor					
	Max. Output not Exceeding 300% of Rated Value			Max. Output Exceeding 300% of Rated Value		
	AC Motor (Standard Motor, Synchronous Motor) DC Motor (Shunt), Engine with 2 or More Cylinders			Special Motor (High torque), Single-Cylinder Engine DC Motor (Series), Operation with Lye Shaft or Clutch		
	Operation Hours			Operation Hours		
	Intermittent use 1 Day 3 to 5 hrs	Regular Use 1 Day 8 to 12 hrs	Continuous Use 1 Day 8 to 12 hrs	Intermittent use 1 Day 3 to 5 hrs	Regular Use 1 Day 8 to 12 hrs	Continuous Use 1 Day 8 to 12 hrs
Exhibit Instrument, Projector, Measuring Instrument, Medical Machine	1.0	1.2	1.4	1.2	1.4	1.6
Cleaner, Sewing Machine, Office Machine, Carpentry Lathe, Belt Sawing Machine	1.2	1.4	1.6	1.4	1.6	1.8
Light Load Belt Conveyor, Packer, Sifter	1.3	1.5	1.7	1.5	1.7	1.9
Liquid Mixer, Drill Press, Lathe, Screw Machine, (Circular Sawing) Machine, Planer, Washing Machine, Paper Manufacturing Machine (Excluding Pulp Manufacturing Machine), Printing Machine	1.4	1.6	1.8	1.6	1.8	2.0
Mixer (Cement and Viscous Matter), Belt Conveyor (Ore, Coal and Sand), Grinder, Shaping Machine, Boring Machine, Milling Machine, Compressor (Centrifugal), Vibration Sifter, Textile Machine (Warper and Winder), Rotary Compressor, Compressor (Reciprocal)	1.5	1.7	1.9	1.7	1.9	2.1
Conveyor (Apron, Pan, Bucket and Elevator), Extraction, Fan, Blower (Centrifugal, Suction and Discharge), Power Generator, Exciter, Hoist, Elevator, Rubber Processor (Calender, Roll and Extruder), Textile Machine (Weaving Machine, Fine Spinning Machine, Twisting Machine and Weft Winding Machine)	1.6	1.8	2.0	1.8	2.0	2.2
Centrifugal Separator, Conveyor (Feed and Screw), Hammer Mill, Paper Manufacturing Machine (Pulpapitor)	1.7	1.9	2.1	1.9	2.1	2.3

Typical machines using a belt are listed above. For other machines using a belt, a load correction coefficient should be determined by reference to this table.
In the case of starts / stops over 100 times per day or rapid acceleration / deceleration, check the above values multiplied by 1.3. (MTS_M only)

Table 2. Speed Ratio Correction Coefficient (Kr)

Speed Ratio	Coefficient (Kr)
1.00 to 1.25	0
1.25 to 1.75	0.1
1.75 to 2.50	0.2
2.50 to 3.50	0.3
3.50 or more	0.4

Table 3. Idlers Correction Coefficient (Ki)

Position of Idler	Coefficient (Ki)
Outside the loose side of the belt	0
Inside the loose side of the belt	0.1
Outside the tensioned side of the belt	0.1
Inside the tensioned side of the belt	0.2

[Step 2-b] Calculating Design Power ……For P_M/UP_M Series

•Design Power (Pd) =Transmission Power (Pt) x Overload Factor (Ks)
· Calculate Transmission Power at Motor Rated Power Output. (It is ideal to calculate from the actual load applied to the belt.)
· Normal Motor Load Factor (Ks)=Ko+Ki+Kr+Kh

Ko : Application Coefficient (Table 4)
Ki : Idler Correction Factor (Table 5)
Kr : Speed Multiplication Correction Factor (Table 6)
Kh : Operation Time Correction Factor (Table 7)

Table 4. Service Coefficient (Ko)

Type of Driven machine \ Type of Motor (Peak Output/Basic Output)				Ⅰ 200% or Less	Ⅱ 200 to 300	Ⅲ 300% or More
A	Extremely Smooth Transmission			1.0	1.2	1.4
B	Fairly Smooth Transmission			1.3	1.5	1.7
C	Transmission with Moderate Impact			1.6	1.8	2.0
D	Transmission with Considerable Impact			1.8	2.0	2.2
E	Transmission with Large Impact			2.0	2.2	2.5
Motor	AC Motor	Single-Phase		–	–	All Types
		Squirrel-Cage Induction	2 Poles	100kW or More	90~3.7kW	2.2kW or Less
			4 Poles	55kW or More	45kW or Less	–
			6 Poles	37kW or More	30kW or Less	–
			8 Poles	15kW or More	11kW or Less	–
		Wire-Wound	4 Poles	–	15kW or Less	11kW or Less
			6 Poles	–	11kW or Less	7.5kW or Less
			8 Poles	–	5.5kW or Less	3.7kW or Less
		Synchronous Motor		–	Average Torque	High Torque
	DC Motor			Shunt	Compound	Series
	Internal Combustion Engine			8 or More Cylinders	7 ~ 5 Cylinders	4 ~ 2 Cylinders
	Hydraulic Motor			–	–	All Types

Note) For transmission involving forward/reverse operation, a large moment of inertia, extremely large impact, etc., the basic service coefficient may be 2.5 or more.

Type	Typical Driven Machines
A	Measuring Instrument, Camera Device, Radar, Medical Machine, Projector
B	Belt Conveyor (For Light Load) Chain Conveyor (For Light Load) Driller Press, Lathe, Screw Machine Electric Typewriter, Calculator, Duplicator, Printing Press, Cutter, Paper Folder, Printer, Mixer, Calender-Dryer, Lathe, Belt Sawing Machine, Plane, Circular Sawing Machine, Planer, Mixer (Liquid), Bread Baking Machine, Flour Kneading Machine, Sifter (Drum and Cone), Sawing Machine
C	Belt Conveyor (Ore, Coal, Sand), Elevator, Boring Mill, Grinder, Milling Machine, Shaper, Metal Sawing Machine, Wind Hoist, Dryer, Washing Machine (Including a Wringer), Excavator, Mixer, Granulating Machine, Pump (Centrifugal, Gear and Rotary), Compressor (High-Speed Center), Stirrer, Mixer (Viscous Matter), Centrifugal Forced Blower, General Rubber Handling Machine, Power Generator, Sifter (Electric)
D	Conveyor (Apron, Bucket, Flight, Screw), Hoist, Cutting Press, Shattering Machine, Pulp Manufacturing Machine, Weaving Machine, Spinning Machine, Twisting Machine, Blender, Centrifugal Separator, Blower (Axial Flow, for Mining and Roots), General Construction Equipment, Hammer Mill, Rollgang
E	Crank Press, Pump (Reciprocal), Compressor (Reciprocating), Civil Engineering, Mining Equipment Including Crushing Machine (Ball, Rod, Gravel), Rubber Mixer

Table 5. Correction Coefficient when Idler is Used (Ki)

Location of Idler in Use	Inside	Outside
Loose Side of the Belt	0	+0.1
Tense Side of the Belt	+0.1	+0.2

Should be applied for each idler.

Table 6. Speed Increase Correction Coefficient (Kr)

Speed Increase Ratio	Correction Coefficient
1 to 1.25	0
1.25 to 1.75	+0.1
1.75 to 2.5	+0.2
2.5 to 3.5	+0.3
3.5 or more	+0.4

Table 7. Operating time Correction Coefficient (Kh)

Operation Hours	Correction Coefficient
Operated 10 or More Hours a Day	+0.1
Operated 20 or More Hours a Day	+0.2
Operated 500 Hours or Less (For Seasonal Operation)	–0.2

Selection is easy with Timing Pulleys and Belts automatic calculation tool available at:
http://fawos.misumi.jp/FA_WEB/pulley_sea/

[Step 3] Temporarily Selecting the Type of Belt from Selection Guide Table

Table 19. Selection Guide Table 1 (MXL,XL,L,H,T5,T10)

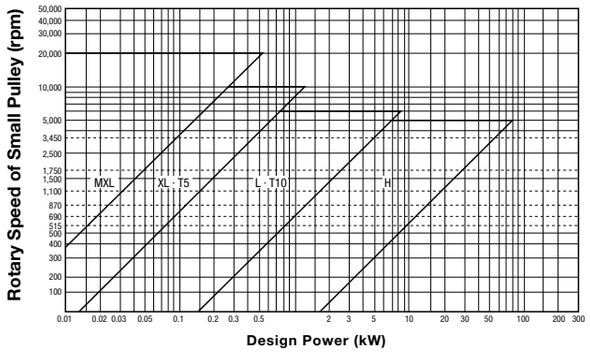


Table 20. Selection Guide Table 2 (S_M series)

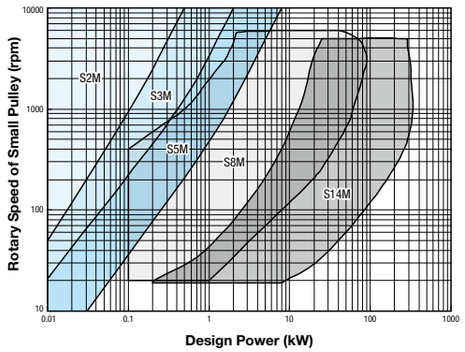


Table 21. Selection Guide Table 3 (P_M series)

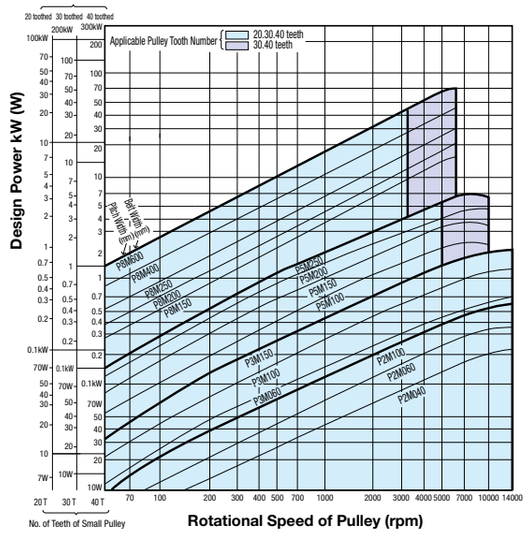


Table 22. Selection Guide Table 4 (MTS8M)

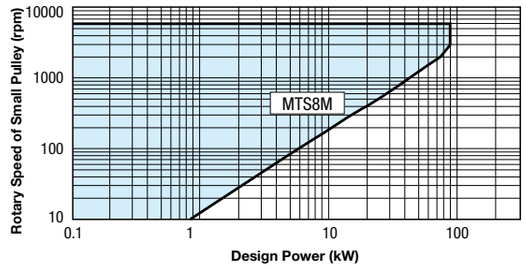


Table 23. Selection Guide Table 5 (UP_M series)

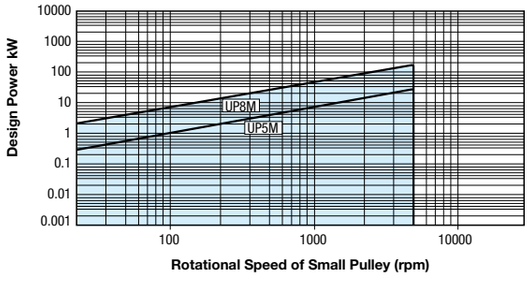


Table 24. Selection Guide Table (2GT·3GT series)

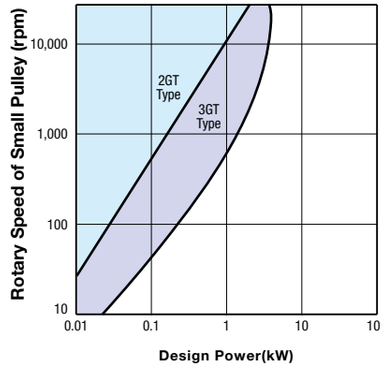
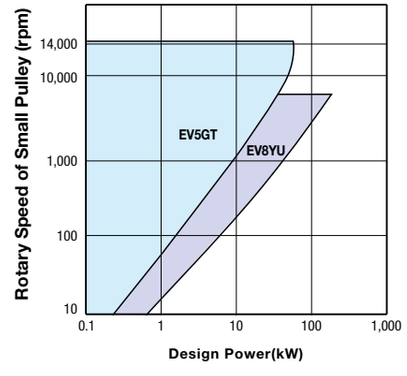


Table 25. Selection Guide Table (EV5GT·EV8YU series)



[Step 4] Determining Number of Teeth of Large and Small Pulley, Belt Length, Inter-Shaft Distance

(1) Select the number of teeth of large and small pulley from **P.2261~2271**, which can satisfy the predeterminated speed ratio.
(However, select the small pulley with number of teeth more than Min. Number of Teeth on Table 26.)

$$\text{Speed Ratio} = \frac{\text{Number of Teeth of Large Pulley}}{\text{Number of Teeth of Small Pulley}}$$

Table 26. Allowable min. number of teeth

Rotary Speed of Small Pulley (rpm)	Type of Belt, Minimum Number of Teeth																					
	MXL	XL	L	H	S2M	S3M	S5M	S8M	S14M	P2M	P3M	P5M	P8M	UP5M	UP8M	MTS8M	T5	T10	2GT	3GT	EV5GT	EV8YU
900 or Less	12	11	14	16	16	16	16	24	–	14	14	18	22	18	22	24	12	16	12	14	18	26
Over 900 1200 or Less	15	11	14	18	16	16	20	25	40	14	14	20	24	20	24	24	14	18	14	14	20	28
Over 1200 1800 or Less	15	12	16	20	18	18	24	28	48	14	14	24	26	24	26	26	16	20	16	16	24	32
Over 1800 3600 or Less	16	16	19	24	20	20	24	30	–	16	18	28	28	28	28	28	18	22	18	20	28	36
Over 3600 4800 or Less	–	16	20	24	20	20	24	32	–	18	20	30	30	30	30	28	18	22	20	20	30	–
Over 4800 10000 or Less	–	–	–	–	20	20	26	–	–	20	28	40	–	40	–	–	–	–	–	–	–	–

(2) Determine approx. belt circum. length (Lp') in terms of temporary inter-shaft distance (C'), diameter of large pulley (Dp) and diameter of small pulley (dp).
(Calculate pulley diameter with P.D. dimensions.)

$$Lp' = 2C' + \frac{\pi(Dp+dp)}{2} + \frac{(Dp-dp)^2}{4C'}$$

C' : Temporary Inter-shaft Distance
dp : Pitch Diameter of Small Pulley (mm)
Dp : Pitch Diameter of Large Pulley (mm)
Lp' : Approx. Belt Circum. Length (mm)

(3) Determine a belt circum. length (Lp') that is the nearest value to approx. belt circum. length referring to **P.1459~1470**, and then calculate the correct inter-shaft distance using the following formula.

$$C = \frac{b + \sqrt{b^2 - 8(Dp-dp)^2}}{8}$$

$$b = 2Lp - \pi(Dp+dp)$$

Dp : Pitch Diameter of Large Pulley (mm)
dp : Pitch Diameter of Small Pulley (mm)
Lp : Belt Circum. Length (mm)
C : Inter-shaft Distance

[Step 5] Determining Belt Width

(1)Calculate an approx. belt width using the following formula, and then select a belt width (Bw':mm) that is the nearest value to the approximated value.

$$Bw' = \frac{Pd}{Ps \cdot Km} \times Wp$$

Pd: Design Power
Ps: Reference Transmission Capacity……Use the Reference Transmission Capacity Table on **P.2261~2271.**
Km: Engagement Correction Coefficient (Table 27)
Wp: Reference Belt Width (Table 28)

Table 27. Engagement Correction Coefficient (Km)

No. of Teeth Engaged Zm	More than 6	5	4	3	2
Km	1.0	0.8	0.6	0.4	0.2
*Km	1.0	0.7	0.5	-	-

$$\text{No. of Teeth Engaged (Zm)} = \frac{Zd \cdot \theta}{360°}$$

$$\theta = 180° - \frac{57.3(Dp-dp)}{C}$$

Zd: No.of Teeth of Small Pulley
θ : Contact Angle (°)
Dp: Pitch Diameter of Large Pulley (mm)
dp: Pitch Diameter of Small Pulley (mm)
C:Inter-shaft Distance (mm)

Table 28. Reference Belt Width (Wp)

Type of Belt	MXL	XL	L	H	S2M	S3M	S5M	S8M	S14M	MTS8M
Reference Belt Width	6.4	25.4	25.4	25.4	4	6	10	60	120	60

Type of Belt	P2M	P3M	P5M	P8M	T5	T10
Reference Belt Width	4	6	10	15	10	10

(2)Check if Design Power (Pd) satisfies the following formula. (If not, select the belt width of one size larger again.)
For belt types P□M and UP□M, substitute *Km for meshing compensation factor

· Pd<Ps · Km · Kb
■2GT · 3GT · EV5GT · EV8YU
· Pd<Ps · Km · Kb · KL

Pd : Design Power
Ps : Reference Transmission Capacity
Km : Engagement Correction Coefficient
Kb : Width Correction Coefficient (Table 29)
KL : Length Correction Coefficient (Table 30)

Table 29. Width Correction Coefficient (Kb)

Type of Belt	Belt Width Nominal	Belt Width mm	Width Correction Coefficient Kb
MXL	019	4.8	0.72
	025	6.4	1.00
	037	9.5	1.57
	050	12.7	2.18
XL	025	6.4	0.15
	031	7.9	0.21
	037	9.5	0.28
	050	12.7	0.42
L	050	12.7	0.42
	075	19.1	0.71
	100	25.4	1.00
	150	38.1	1.56
H	075	19.1	0.71
	100	25.4	1.00
	150	38.1	1.56
	200	50.8	2.14

Type of Belt	Belt Width Nominal	Belt Width mm	Width Correction Coefficient Kb
S2M	040	4	1.00
	060	6	1.59
	100	10	2.84
S3M	060	6	1.00
	100	10	1.79
	150	15	2.84
S5M	100	10	1.00
	150	15	1.59
	250	25	2.84
S8M MTS8M	150	15	0.21
	250	25	0.37
	300	30	0.45
	400	40	0.63
S14M	400	40	0.29
	600	60	0.45

Type of Belt	Belt Width Nominal	Belt Width mm	Width Correction Coefficient Kb
P2M	040	4	1.00
	060	6	1.59
P3M	100	10	1.78
	150	15	2.84
P5M	100	10	1.00
	150	15	1.59
P8M	150	15	1.00
	250	25	1.79
T5	100	10	1.00
	150	15	1.60
	200	20	2.30
	250	25	2.90
T10	150	15	1.60
	200	20	2.30
	250	25	2.90
	300	30	3.50
	400	40	4.60
	500	50	5.80

Type of Belt	Belt Width Nominal	Belt Width mm	Width Correction Coefficient Kb
2GT	4	4	1.00
	6	6	1.67
	9	9	2.67
3GT	6	6	1.00
	9	9	1.66
	15	15	2.97
EV5GT	9	9	0.53
	12	12	0.76
	15	15	1.00
EV8YU	15	15	0.71
	20	20	1.00
	25	25	1.29

Table 30. Length Correction Coefficient(KL)

Length Correction Coefficient(KL)	0.80	0.90	1.00	1.10	1.20
2GT Belt Length(mm)	130 or less	131~182	183~280	281~419	420 or less
3GT Belt Length(mm)	190 or less	191~260	261~400	401~599	600 or less
EV5GT Belt Length(mm)	440 or less	441~550	551~800	801~1100	1001 or less
EV8YU Belt Length(mm)	600 or less	601~900	901~1250	1251~1799	1800 or less

Selection is easy with Timing Pulleys and Belts automatic calculation tool available at:
http://fawos.misumi.jp/FA_WEB/pulley_sea/

[Step 6] Check if Inter-Shaft Distance Adjustment Range is Larger than that in Table 30

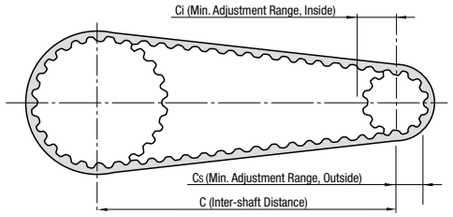


Table 31 Minimum Inter-Axial Distance Adjustment Range

Belt Length	Length Tolerance	Inter-Shaft Distance Tolerance	MXL		XL		L		H		S2M S3M S5M		S8M S14M		MTS8M		P2M P3M P5M		P8M		T5		T10	
			Ci	Cs	Ci	Cs	Ci	Cs	Ci	Cs	Ci	Cs	Ci	Cs	Ci	Cs	Ci	Cs	Ci	Cs	Ci	Cs	Ci	Cs
150 or Less	±0.35	±0.18		3		3		3		3		2		3		–		3		3		3		3
150 to 250	±0.41	±0.21		3		3		3		3		2		3		3		3		3		3		3
250 to 380	±0.46	±0.23		5		5		5		5		2		3		3		3		3		5		5
380 to 500	±0.51	±0.26		10		10		10		10		2		3		3		3		3		10		10
500 to 750	±0.60	±0.30		10		10		10		10		3		5		3		5		5		10		10
750 to 1000	±0.66	±0.33	3	15	5	15	10	15	15	15	10	3	15	5	15	5	10	5	15	5	5	15	10	15
1000 to 1250	±0.76	±0.38		15		15		15		15		5		10		5		10		10		15		15
1250 to 1500	±0.82	±0.41		25		25		25		25		5		10		10		10		10		25		25
1500 to 1750	±0.86	±0.43		25		25		25		25		5		10		10		10		10		25		25
1750 to 2000	±0.92	±0.46		30		30		30		30		5		10		10		10		10		30		30

Belt Length		Length Tolerance	Inter-Shaft Distance Tolerance	2GT		3GT		EV5GT		EV8YU	
				Ci	Cs	Ci	Cs	Ci	Cs	Ci	Cs
	150 or Less	± 0.40	± 0.20		3		3		3		3
Over 150	250 or Less	± 0.40	± 0.20		3		3		3		3
Over 250	380 or Less	± 0.46	± 0.23		3		3		3		3
Over 380	500 or Less	± 0.50	± 0.25		3		3		3		3
Over 500	750 or Less	± 0.60	± 0.30	4	5	5	5	10	5	20	5
Over 750	1000 or Less	± 0.66	± 0.33		5		5		5		5
Over 1000	1250 or Less	± 0.76	± 0.38		10		10		10		10
Over 1250	1500 or Less	± 0.82	± 0.41		10		10		10		10
Over 1500	1750 or Less	± 0.86	± 0.43		10		10		10		10
Over 1750	2000 or Less	± 0.92	± 0.46		10		10		10		10

■Precautions on Operation

1. Be careful to avoid the ingress of foreign particles.
   When solid foreign particles enter during operation, it can scratch the belt and adversely affect the engagement of the belt and the pulley.
   In some cases, the pulley may disengage, land on the teeth of the pulley, and be cut.
2. Avoid Adhesion of oil.
   Oil on the rubber timing belt may wet and expand it, drastically shortening its service life.
   (a)Take special care when using solvent type oil.
   (b)A small amount of lubricant or grease, however, rarely causes a trouble.
3. Do not use the belt in a humid atmosphere.
4. Please use a well-ventilated safety cover.
5. The service life of the belt, when used at a high temperature (80℃ or more), can be drastically shortened.

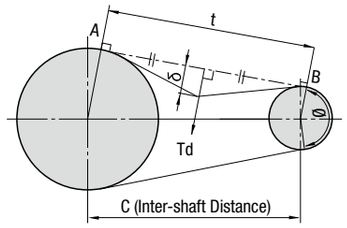
‹Reference›**Belt Width Tolerance** (Unit: mm)

Belt Width	Belt Length			
	351 or Less	351 to 840	840 to 1680	1680 or More
10 or Less	+0.3 −0.6	+0.3 −0.6	+0.3 −0.6	+0.6 −0.6
10 to 40	+0.6 −0.6	+0.6 −0.6	+0.6 −0.6	+0.6 −0.6
40 to 50	+0.6 −0.6	+0.6 −0.6	+1.0 −1.0	+1.0 −1.3

Cautions on Use of Belt

■How to Extend Belt

When the belt is too taut, its service life can be shortened, while when it is not taut enough, the belt may (jump off) the groove of the pulley due to an activating torque or shock load. Keep the belt stationary and optimize its tautness. The warp load necessary to provide the optimum tautness can be calculated from values representing the belt, its width and the span in equation A below. Apply deflection load between max. value and recommended value.



$$Td = \frac{Ti + \frac{t \times Y}{Lp}}{16} \quad \text{Equation A}$$

Td: Load N Needed for Deflection d at the Center of Span t

Ti : Initial Tension N — From Table 31
Y : Correction Coefficient — From Table 31
δ : Deflection (mm) — δ=0.016t
t : Span Length (mm) — $t = \sqrt{C^2 - \frac{(Dp-dp)^2}{4}}$
Lp : Length of the Belt (mm)
C : Inter-shaft Distance (mm)
dp : Diameter of the Pitch Circle of the Small Pulley (mm)
Dp : Diameter of the Pitch Circle of the Large Pulley (mm)

Table 32. Initial Tension (Ti) and Correction Coefficient (Y)

Type	Ti·Y		Belt Nominal Width / Belt Width mm	019 / 4.8	025 / 6.4	031 / 7.9	037 / 9.5	050 / 12.7	075 / 19.1	100 / 25.4	150 / 38.1	200 / 50.8
MXL	Ti (N)	Max. Value		9.8	13.7	–	21.6	29.9	–	–	–	–
		Recommended Value		5.8	8.2		12.9	18.0				
	Coefficient Y			–	–	–	–	–	–	–	–	–
XL	Ti (N)	Max. Value		–	29	37	44	67	–	–	–	–
		Recommended Value			18	25	32	51				
	Coefficient Y			–	3.8	5.4	7.6	11.8	–	–	–	–
L	Ti (N)	Max. Value		–	–	–	–	76	125	175	273	–
		Recommended Value						52	87	123	191	
	Coefficient Y			–	–	–	–	44.1	75.5	107	165	–
H	Ti (N)	Max. Value		–	–	–	–	–	293	421	646	889
		Recommended Value							222	312	486	668
	Coefficient Y			–	–	–	–	–	142	205	317	423

Type	Ti·Y		Belt Nominal Width / Belt Width mm	60 / 6	100 / 10	150 / 15	250 / 25
P2M	Ti (N)	Max. Value		13	–	–	–
		Recommended Value		9.8			
	Coefficient Y			0.9	–	–	–
P3M	Ti (N)	Max. Value		–	46	74	–
		Recommended Value			34	55	
	Coefficient Y			–	1.9	3.0	–
P5M	Ti (N)	Max. Value		–	147	225.4	–
		Recommended Value			107.8	166.6	
	Coefficient Y			–	56.9	82.4	–
P8M	Ti (N)	Max. Value		–	–	294	509.6
		Recommended Value				225.4	382.2
	Coefficient Y			–	–	135	239

Type	Ti·Y		Belt Nominal Width / Belt Width mm	40 / 4	60 / 6	100 / 10	150 / 15	250 / 25	300 / 30	400 / 40	600 / 60
S2M	Ti (N)	Max. Value		7.8	12.7	22.6	–	–	–	–	–
		Recommended Value		5.9	9.8	16.7					
	Coefficient Y			9.8	15.7	27.4	–	–	–	–	–
S3M	Ti (N)	Max. Value		–	26	46	73	–	–	–	–
		Recommended Value			20	34	54				
	Coefficient Y			–	26.5	46.1	75.5	–	–	–	–
S5M	Ti (N)	Max. Value		–	–	77	124	221	–	–	–
		Recommended Value				58	93	166			
	Coefficient Y			–	–	52.8	85.5	151.0	–	–	
S8M MTS8M	Ti (N)	Max. Value		–	–	–	294	510	628	873	
		Recommended Value					226	382	470	657	
	Coefficient Y			–	–	–	98	196	235	333	
S14M	Ti (N)	Max. Value		–	–	–	–	–	–	1226	1912
		Recommended Value								1108	1726
	Coefficient Y			–	–	–	–	–	–	686	1059

Type	Ti·Y		Belt Nominal Width / Belt Width mm	100 / 10	150 / 15	200 / 20	250 / 25	300 / 30	400 / 40	500 / 50
T5	Ti (N)	Max. Value		37.3	59	85	106	–	–	–
		Recommended Value		24.5	39	59	74			
	Coefficient Y			16.7	26.5	38.2	47.5	–	–	–
T10	Ti (N)	Max. Value		–	162	235	294	363	500	628
		Recommended Value			108	157	196	245	333	422
	Coefficient Y			–	71.6	104.9	130.4	163.8	222.6	281.5

Type	Ti·Y		Belt Nominal Width / Belt Width mm	4 / 4	6 / 6	9 / 9	12 / 12	15 / 15	20 / 20	25 / 25
2GT	Ti (N)	Max. Value		12.2	20.5	32.8	–	–	–	–
		Recommended Value		9.4	15.8	25.2				
	Coefficient Y			–	–	–	–	–	–	–
3GT	Ti (N)	Max. Value		–	38	57	–	96	–	–
		Recommended Value			29	44		74		
	Coefficient Y			–	–	–	–	–	–	–
EV5GT	Ti (N)	Max. Value		–	–	92	127	163	–	–
		Recommended Value				71	98	125		
	Coefficient Y			–	–	–	–	–	–	–
EV8YU	Ti (N)	Max. Value		–	–	–	–	273	364	455
		Recommended Value						210	280	350
	Coefficient Y			–	–	–	–	–	–	–

Selection is easy with Timing Pulleys and Belts automatic calculation tool available at:
http://fawos.misumi.jp/FA_WEB/pulley/

Table 41. Reference Transmission Capacity of S14M Ps -Belt Width 120mm- (kW)

Rotary Speed of Small Pulley(rpm) \ Number of Teeth of the Pulley / Pitch Dia. (mm)	28	30	32	34	36	40	42	44	48	50	56	60	64	72	84
	124.78	133.69	142.60	151.52	160.43	178.25	187.17	196.08	213.90	222.82	249.55	267.38	285.21	320.86	374.33
575	32.08	34.36	36.63	38.90	41.17	45.68	47.94	50.19	54.67	56.91	63.58	68.00	72.39	81.10	93.92
690	38.45	41.17	43.88	46.59	49.29	54.67	57.36	60.03	65.35	68.00	75.89	81.09	86.26	96.44	111.32
870	48.35	51.75	55.14	58.52	61.88	68.57	71.90	75.20	81.77	85.03	94.68	101.02	107.27	119.49	136.99
1160	64.12	68.57	73.00	77.40	81.77	90.41	94.69	98.92	107.27	111.39	123.46	131.27	138.87	153.39	173.25
1750	95.20	101.57	107.84	114.03	120.11	131.93	137.68	143.29	154.11	159.32	174.00	182.96	191.21	205.36	220.00
3450	172.13	181.10	189.39	196.95	203.72	214.76	218.93	222.13	225.47						
20	1.12	1.20	1.28	1.36	1.44	1.60	1.68	1.76	1.92	2.00	2.24	2.40	2.56	2.88	3.36
40	2.24	2.40	2.56	2.72	2.88	3.20	3.36	3.52	3.84	4.00	4.48	4.80	5.12	5.76	6.71
60	3.36	3.60	3.84	4.08	4.32	4.80	5.04	5.28	5.76	6.00	6.71	7.19	7.67	8.63	10.07
80	4.48	4.80	5.12	5.44	5.76	6.39	6.71	7.03	7.67	7.99	8.95	9.59	10.23	11.51	13.42
90	5.04	5.40	5.76	6.12	6.47	7.19	7.55	7.91	8.63	8.99	10.07	10.79	11.51	12.94	15.10
100	5.60	6.00	6.39	6.79	7.19	7.99	8.39	8.79	9.59	9.99	11.19	11.99	12.79	14.38	16.77
200	11.19	11.99	12.78	13.58	14.38	15.98	16.78	17.57	19.17	19.96	22.35	23.94	25.53	28.71	33.47
300	16.78	17.97	19.17	20.36	21.56	23.94	25.14	26.33	28.71	29.90	33.47	35.84	38.21	42.94	49.99
400	22.35	23.94	25.53	27.12	28.71	31.88	33.47	35.05	38.21	39.79	44.51	47.65	50.78	57.01	66.27
500	27.92	29.90	31.88	33.86	35.84	39.79	41.76	43.72	47.64	49.60	55.45	59.33	63.20	70.87	82.22
600	33.47	35.84	38.21	40.58	42.94	47.64	49.99	52.34	57.00	59.33	66.27	70.87	75.43	84.47	97.76
700	39.00	41.76	44.51	47.26	49.99	55.45	58.17	60.88	66.27	68.96	76.95	82.22	87.45	97.76	112.80
800	44.51	47.65	50.77	53.90	57.01	63.19	66.27	69.34	75.43	78.46	87.45	93.36	99.21	110.68	127.26
900	49.99	53.51	57.00	60.49	63.97	70.87	74.29	77.70	84.47	87.82	97.75	104.27	110.68	123.19	141.06
1000	55.45	59.33	63.19	67.04	70.87	78.46	82.22	85.96	93.36	97.03	107.84	114.90	121.82	135.23	154.11
1100	60.88	65.12	69.34	73.54	77.70	85.96	90.05	94.10	102.11	106.06	117.68	125.23	132.60	146.75	166.35
1200	66.27	70.87	75.43	79.97	84.47	93.36	97.76	102.11	110.68	114.90	127.26	135.23	142.97	157.70	177.67
1300	71.63	76.57	81.47	86.34	91.16	100.66	105.35	109.97	119.07	123.53	136.53	144.87	152.91	168.02	188.00
1400	76.95	82.22	87.45	92.63	97.76	107.84	112.80	117.69	127.26	131.94	145.49	154.12	162.37	177.67	197.26
1500	82.22	87.82	93.36	98.85	104.27	114.90	120.11	125.23	135.23	140.10	154.11	162.94	171.32	186.69	205.36
1600	87.45	93.36	99.21	104.99	110.68	121.82	127.26	132.60	142.97	148.00	162.36	171.31	179.72	194.73	212.22
1700	92.63	98.85	104.98	111.04	116.99	128.60	134.25	139.78	150.46	155.62	170.22	179.21	187.53	202.03	217.76
1800	97.76	104.27	110.68	116.99	123.19	135.23	141.06	146.75	157.70	162.94	177.67	186.59	194.73	208.45	221.89
1900	102.83	109.62	116.29	122.85	129.27	141.70	147.69	153.51	164.65	169.95	184.67	193.43	201.26	213.94	224.54
2000	107.85	114.90	121.82	128.61	135.23	147.99	154.12	160.05	171.31	176.63	191.21	199.69	207.11	218.44	225.62
2100	112.80	120.10	127.26	134.25	141.06	154.11	160.34	166.35	177.67	182.96	197.25	205.36	212.22	221.89	
2200	117.69	125.23	132.60	139.78	146.75	160.05	166.35	172.40	183.70	188.93	202.79	210.39	216.56	224.26	
2300	122.51	130.27	137.83	145.19	152.30	165.78	172.13	178.18	189.39	194.51	207.78	214.76	220.10	225.47	
2400	127.26	135.23	142.97	150.47	157.70	171.31	177.67	183.70	194.72	199.69	212.22	218.43	222.80	225.50	
2500	131.94	140.10	147.99	155.62	162.94	176.63	182.97	188.93	199.69	204.46	216.06	221.39	224.63		
2600	136.54	144.87	152.90	160.63	168.02	181.82	188.00	193.86	204.27	208.78	219.29	223.59	225.54		
2700	141.06	149.54	157.70	165.51	172.93	186.58	192.77	198.49	208.45	212.66	221.89	225.01	225.50		
2800	145.50	154.12	162.36	170.23	177.67	191.21	197.26	202.79	212.22	216.06	223.83	225.62			
2900	149.85	158.58	166.90	174.80	182.22	195.58	201.46	206.76	215.55	218.98	225.08				
3000	154.12	162.94	171.31	179.21	186.59	199.69	205.36	210.39	218.43	221.39	225.62				
3100	158.29	167.19	175.58	183.46	190.76	203.53	208.95	213.66	220.86	223.28					
3200	162.37	171.31	179.71	187.53	194.73	207.10	212.22	216.56	222.80	224.63					
3300	166.35	175.32	183.70	191.44	198.49	210.39	215.16	219.09	224.25	225.42					
3400	170.23	179.21	187.53	195.16	202.03	213.37	217.76	221.22	225.20	225.63					
3500	174.00	182.96	191.21	198.69	205.36	216.06	220.01	222.94	225.62						
3600	177.67	186.59	194.72	202.04	208.45	218.43	221.89	224.26							
3700	181.23	190.08	198.08	205.18	211.32	220.49	223.41	225.14							
3800	184.67	193.43	201.26	208.12	213.94	222.21	224.54	225.58							
3900	188.00	196.63	204.27	210.86	216.31	223.59	225.28	225.58							
4000	191.21	199.69	207.10	213.38	218.44	224.63	225.62								
4100	194.30	202.60	209.75	215.68	220.30	225.30									
4200	197.26	205.36	212.22	217.76	221.89	225.62									
4300	200.09	207.95	214.49	219.61	223.21										
4400	202.79	210.39	216.56	221.22	224.26										
4500	205.36	212.66	218.43	222.59	225.01										
4600	207.79	214.76	220.10	223.71	225.47										
4700	210.08	216.68	221.56	224.58	225.64										
4800	212.22	218.43	222.80	225.20											
4900	214.22	220.00	223.83	225.55											
5000	216.06	221.39	224.63	225.63											

* Endurance time will be reduced in [- - -] marked area. Please avoid if possible.
* The circumferential speed of pulley is 33 (m/s) or more in the [ ] marked range; a dymanic balance for the pulley is essential.
* The above table assumes the reference belt width of 120mm. For belts other than 120mm wide, multiply the compensation factors Kb from Table 29.

Table 42. Reference Transmission Capacity of MTS8M Ps -Belt Width 60mm- (kW)

Rotary Speed of Small Pulley(rpm) \ Number of Teeth of the Pulley / Pitch Dia. (mm)	24	26	28	30	32	34	36	38	40	42	44	46	48	50	60	72	84
	61.12	66.21	71.30	76.39	81.49	86.58	91.67	96.77	101.86	106.95	112.05	117.14	122.23	127.32	152.79	183.35	213.90
50	1.35	1.47	1.58	1.70	1.82	1.93	2.05	2.17	2.27	2.37	2.46	2.56	2.66	2.75	3.21	3.75	4.27
100	2.71	2.94	3.17	3.40	3.63	3.87	4.11	4.35	4.54	4.74	4.93	5.12	5.31	5.50	6.42	7.50	8.54
200	4.91	5.32	5.73	6.15	6.57	6.99	7.42	7.85	8.20	8.54	8.89	9.22	9.56	9.89	11.52	13.41	15.23
300	6.91	7.48	8.06	8.64	9.23	9.83	10.43	11.04	11.52	12.00	12.47	12.94	13.41	13.87	16.12	18.71	21.20
400	8.77	9.50	10.23	10.98	11.73	12.48	13.25	14.02	14.63	15.23	15.82	16.41	16.99	17.57	20.38	23.62	26.72
500	10.53	11.40	12.29	13.18	14.08	14.99	15.92	16.85	17.57	18.28	18.99	19.69	20.38	21.07	24.40	28.22	31.88
600	12.20	13.22	14.24	15.28	16.33	17.39	18.46	19.55	20.38	21.20	22.02	22.82	23.62	24.40	28.22	32.59	36.76
700	13.80	14.95	16.11	17.29	18.48	19.69	20.91	22.15	23.09	24.01	24.92	25.82	26.72	27.60	31.88	36.76	41.39
800	15.32	16.61	17.91	19.23	20.56	21.91	23.28	24.66	25.70	26.72	27.72	28.72	29.70	30.68	35.39	40.74	45.81
900	16.79	18.21	19.64	21.09	22.56	24.05	25.56	27.10	28.22	29.34	30.44	31.52	32.59	33.65	38.77	44.57	50.04
1000	18.21	19.75	21.31	22.89	24.50	26.13	27.78	29.46	30.68	31.88	33.06	34.23	35.39	36.53	42.03	48.25	54.09
1100	19.57	21.24	22.92	24.64	26.38	28.14	29.94	31.76	33.06	34.35	35.62	36.87	38.10	39.32	45.19	51.80	57.98
1200	20.89	22.67	24.48	26.33	28.20	30.10	32.04	34.00	35.39	36.76	38.10	39.43	40.74	42.03	48.25	55.22	61.71
1300	22.16	24.06	26.00	27.97	29.97	23.01	34.08	36.19	37.66	39.10	40.52	41.93	43.31	44.67	51.21	58.52	65.29
1400	23.38	25.40	27.46	29.56	31.69	33.86	36.07	38.33	39.87	41.39	42.89	44.36	45.81	47.24	54.09	61.71	68.73
1500	24.57	26.71	28.88	31.10	33.37	35.67	38.02	40.41	42.03	43.62	45.19	46.73	48.25	49.74	56.88	64.79	72.03
1600	25.71	27.97	30.26	32.61	35.00	37.44	39.92	42.46	44.15	45.81	47.44	49.05	50.63	52.18	59.59	67.76	75.19
1700	26.82	29.19	31.60	34.07	36.59	39.16	41.78	44.46	46.22	47.95	49.64	51.31	52.95	54.56	62.23	70.63	78.22
1800	27.89	30.37	32.90	35.49	38.14	40.84	43.60	46.42	48.25	50.04	51.79	53.52	55.22	56.88	64.78	73.40	81.12
1900	28.92	31.51	34.16	36.87	39.65	42.48	45.38	48.35	50.23	52.08	53.90	55.68	57.43	59.15	67.27	76.07	83.89
2000	29.92	32.62	35.39	38.22	41.12	44.09	47.13	50.23	52.18	54.09	55.96	57.79	59.59	61.36	69.68	78.64	86.53
2100	30.89	33.70	36.57	39.53	42.55	45.65	48.83	52.08	54.09	56.05	57.97	59.86	61.71	63.51	72.03	81.12	89.05
2200	31.82	37.74	37.73	40.80	43.95	47.19	50.50	53.90	55.96	57.97	59.95	61.88	63.77	65.62	74.30	83.50	91.43
2300	32.72	35.74	38.85	42.04	45.32	48.68	52.14	55.68	57.79	59.86	61.88	63.85	65.79	67.68	76.51	85.79	
2400	33.59	36.72	39.93	43.25	46.65	50.15	53.74	57.43	59.59	67.71	63.77	65.79	67.76	69.68	78.64	87.98	
2500	34.42	37.66	40.99	44.42	47.95	51.58	55.31	59.15	61.36	63.51	65.62	67.68	69.68	71.64	80.72	90.08	
2600	35.23	38.57	42.01	45.56	49.21	52.98	56.85	60.83	63.09	56.29	67.43	69.52	71.56	73.55	82.72	92.09	
2700	36.00	39.44	43.00	46.67	50.45	54.34	58.36	62.48	64.78	67.02	69.21	71.33	73.40	75.41	84.66		
2800	36.75	40.29	43.96	47.74	51.65	55.68	59.83	64.11	66.45	68.73	70.94	73.09	75.19	77.23	86.53		
2900	37.46	41.11	44.89	48.79	52.82	56.99	61.28	65.70	68.08	70.39	72.64	74.82	76.94	78.99	88.34		
3000	38.15	41.90	45.78	49.80	53.96	58.26	62.70	67.27	69.68	72.03	74.30	76.50	78.64	80.71	90.08		
3200	39.44	43.39	47.49	51.75	56.16	60.72	65.44	70.31	72.79	75.19	77.51	79.76	81.93	84.02			
3400	40.61	44.76	49.08	53.57	58.23	63.07	68.07	73.25	75.78	78.22	80.58	82.85	85.04	87.14			
3600	41.67	46.02	50.55	55.28	60.19	65.30	70.59	76.07	78.64	81.12	83.50	85.79	87.98	90.08			
3800	42.63	47.17	51.92	56.88	62.04	67.42	73.00	78.78	81.39	83.89	86.29	88.58	90.76				
4000	43.47	48.21	53.17	58.36	63.78	69.42	75.30	81.39	84.02	86.53	88.93	91.21					
4200	44.21	49.14	54.31	59.73	65.41	71.32	77.49	83.89	86.53	89.04	91.43						
4400	44.85	49.96	55.35	61.00	66.92	73.11	79.57	86.29	88.93	91.43							
4600	45.38	50.68	56.27	62.16	68.33	74.80	81.55	88.57	91.21								
4800	45.81	51.29	57.09	63.21	69.64	76.37	83.42	90.76									
5000	46.14	51.80	57.81	64.15	70.83	77.84	85.18										
5200	46.36	52.20	58.41	64.99	71.92	79.20	86.84										
5400	46.48	52.51		65.72	72.90	80.46											
5600	46.51	52.70		66.34	73.78												
5800	46.43			66.86	74.54												
6000	46.25																

* Endurance time will be reduced in [- - -] marked area. Please avoid if possible.
* Because the circumferential speed of pulley within the [ ] marked range is higher than 20m/sec, this range should be avoided whenever possible.
* Values in the table above is for nominal belt width 600(60mm). For other belt widths, those values should be multiplied by the width correction coefficient, Kb, shown in Table 29.

Table 43. Reference Transmission Capacity of P2M Ps -Belt Width 4mm- (W)

Rotary Speed of Small Pulley(rpm) \ No. of Teeth of Small Pulley / Diameter of the Pitch Circle(mm)	14	15	16	18	20	22	24	25	26	28	30	32	34	36	40	42	44	48
	8.91	9.55	10.19	11.46	12.73	14.01	15.28	15.92	16.55	17.83	19.10	20.37	21.65	22.92	25.46	26.74	28.01	30.56
100	2	2	2	2	3	3	3	3	3	4	4	5	5	6	7	7	8	9
200	3	3	4	5	5	6	7	7	7	8	9	10	11	11	13	14	15	17
400	6	6	7	8	9	10	11	12	13	14	15	16	17	19	22	24	25	28
600	8	9	10	11	12	14	16	17	18	19	20	22	23	25	29	31	33	37
800	10	11	12	13	16	18	19	20	21	23	25	27	29	31	36	38	41	46
1000	12	13	14	16	18	20	23	24	25	27	30	32	34	37	42	45	48	54
1200	14	15	16	19	21	23	26	26	28	31	34	37	40	42	48	51	54	61
1400	16	17	18	21	24	26	29	30	32	35	38	41	44	47	54	57	61	68
1450	16	18	19	21	24	27	30	31	33	36	39	42	45	48	55	59	62	70
1500	16	18	19	22	25	28	31	32	34	37	40	43	46	50	57	60	64	71
1600	17	18	20	23	26	29	32	33	35	39	43	46	49	53	60	64	67	75
1750	19	20	22	25	28	31	35	37	38	42	45	49	53	56	64	68	71	79
1800	19	21	23	25	29	32	35	37	38	42	46	50	54	57	65	69	73	81
2000	21	22	24	28	31	34	38	40	42	46	50	54	58	62	70	74	78	87
2400	24	26	28	32	36	40	44	46	48	52	56	61	65	70	80	85	89	99
3000		30	32	37	42	46	52	54	57	62	67	72	77	82	93	98	102	115
3600		35	38	43	48	53	59	62	64	70	76	82	88	94	106	112	118	131
4000		38	41	47	52	58	64	67	70	76	82	88	94	101	114	120	127	140
5000			48	55	61	68	75	78	82	89	96	104	111	118	132	139	147	162
6000			55	63	70	78	86	90	93	101	109	117	125	133	149	157	164	180
8000				76	86	95	105	109	114	123	132	141	150	158	176	184	192	209
10000				91	101	111	122	127	132	142	151	161	170	178	196	203	210	224
12000					114	125	136	141	146	157	166	175	183	190	206	211	217	228
14000					125	136	148	153	158	168	176	185	190	196	208	214	220	232

* Endurance time will be reduced in [- - -] marked area. Please avoid if possible. If the belt width changes, multiply the compensation factors Kb from Table 29.

Table 44. Reference Transmission Capacity of P3M Ps -Belt Width 6mm- (W)

Rotary Speed of Small Pulley(rpm) \ No. of Teeth of Small Pulley / Diameter of the Pitch Circle(mm)	10	12	14	15	16	18	20	22	24	25	26	28	30	32	34	36	40	42
	9.55	11.46	13.37	14.32	15.28	17.19	19.10	20.01	22.92	23.87	24.83	26.74	28.65	30.56	32.47	34.38	38.20	40.11
100	4	5	6	6	7	8	9	10	12	12	13	14	15	17	19	20	22	23
200	8	11	12	13	14	16	18	20	23	24	25	28	31	34	36	38	45	47
400	14	17	20	22	24	27	32	35	39	41	43	47	51	56	61	65	75	79
600	19	23	28	30	33	37	42	47	53	55	58	63	69	75	81	87	100	105
800	24	29	35	38	41	46	53	59	65	68	72	79	85	92	99	107	123	129
1000	28	35	41	44	48	55	62	69	77	81	84	92	100	109	118	126	144	151
1200	33	40	47	51	55	63	71	79	88	92	97	106	115	125	135	144	164	172
1400	37	45	54	58	62	71	80	89	99	104	109	119	129	140	151	162	184	193
1450	38	46	55	59	64	72	82	90	102	106	111	122	133	144	155	166	188	197
1500	39	47	56	60	65	75	84	93	104	109	114	125	135	147	158	170	193	202
1600	41	49	59	63	68	79	88	98	109	114	120	131	142	154	166	178	202	212
1750	44	54	63	68	74	84	95	106	118	124	129	141	153	165	177	190	215	226
1800		55	65	70	75	86	97	108	120	126	131	143	155	168	181	193	219	230
2000		59	70	75	81	93	105	117	129	135	142	155	168	182	196	209	237	249
2400		68	81	87	93	107	121	134	148	155	162	177	192	207	223	238	270	284
3000			95	103	112	125	142	158	175	183	191	208	226	243	261	279	316	332
3600			110	118	127	145	163	182	201	210	219	238	258	278	298	318	359	377
4000			119	128	138	158	176	196	216	226	236	257	278	299	321	342	386	405
5000			141	152	163	186	208	231	255	267	278	302	326	351	375	399	448	470
6000				174	187	212	238	264	291	304	317	343	370	397	424	451	505	530
8000					232	263	293	324	356	371	387	418	448	479	508	538	597	627
10000						308	342	377	413	430	446	480	512	545	574	604	663	696
12000						349	386	423	460	477	495	530	562	594	620	646	699	734
14000							424	462	500	517	534	568	597	626	645	665	704	739

* Endurance time will be reduced in [- - -] marked area. Please avoid if possible. If the belt width changes, multiply the compensation factors Kb from Table 29.

Selection of Transmission Timing Belts 8

-Transmission Capacity Table-

Selection is easy with Timing Pulleys and Belts automatic calculation tool available at:
http://fawos.misumi.jp/FA_WEB/pulley/

Table 45. Reference Transmission Capacity of P5M Ps -Belt Width 10mm- (W)

Rotary Speed of Small Pulley (rpm) \ No. of Teeth of Small Pulley	12	14	16	18	20	22	24	25	26	28	30	32	34	36	40	42	44	48	56
Diameter of the Pitch Circle (mm)	19.10	22.28	25.46	28.65	31.83	35.05	38.20	39.79	41.38	44.56	47.75	50.93	54.11	57.30	63.66	66.85	70.03	76.39	89.15
100	23	26	31	35	41	46	52	55	58	64	70	76	81	86	103	110	118	133	158
200	46	53	63	72	81	92	104	109	115	126	138	151	164	177	205	220	235	267	316
400	77	90	106	122	138	155	173	182	192	211	231	251	272	294	337	361	385	434	514
600	105	123	144	165	188	211	235	247	259	284	310	337	365	394	452	482	513	577	684
800	131	153	179	205	234	262	291	306	322	353	385	417	451	485	556	592	629	706	837
1000	156	182	212	243	276	309	343	361	379	415	453	491	530	570	651	694	738	825	977
1200	179	209	244	280	316	355	394	414	435	476	518	561	605	650	742	790	838	937	1110
1400	201	235	274	319	355	399	443	465	487	532	580	628	677	726	828	880	933	1040	1230
1450		242	282	323	365	409	453	476	499	546	594	643	694	745	850	903	957	1070	1260
1500		248	288	333	374	420	466	489	512	560	609	659	711	762	869	925	981	1090	1290
1600		261	303	348	393	441	489	514	538	588	639	691	745	799	910	970	1030	1140	1350
1750		278	325	372	420	471	522	548	575	628	683	738	795	852	970	1040	1100	1220	1430
1800			332	380	430	481	532	559	586	640	696	753	810	868	989	1050	1110	1240	1460
2000			360	412	465	520	576	605	633	691	751	812	874	937	1060	1130	1200	1330	1570
2400			413	472	532	595	658	691	723	789	857	925	992	1060	1210	1280	1350	1500	2030
3000				557	628	701	775	812	850	926	1000	1080	1150	1240	1400	1485	1570	1730	2120
3600				638	719	801	883	925	966	1050	1140	1230	1310	1400	1580	1670	1760	1940	2250
4000					776	865	953	997	1040	1130	1220	1320	1450	1500	1690	1785	1880	2060	2380
5000					911	1010	1110	1160	1210	1320	1420	1520	1620	1720	1920	2010	2110	2300	2610
6000						1140	1260	1310	1370	1480	1580	1690	1790	1900	2100	2190	2290	2460	2720
8000							1490	1550	1600	1720	1830	1930	2020	2120	2270	2330	2400	2480	2480
10000								1710	1760	1860	1940	2020	2080	2130	2170	2160	2150	2040	
12000								1770	1810	1880	1910	1940	1920	1900					
14000									1750	1760	1710	1660							

* Endurance time will be reduced in [- - -] marked area. Please avoid if possible. If the belt width changes, multiply the compensation factors Kb from Table 29.

Table 46. Reference Transmission Capacity of P8M Ps -Belt Width 15mm- (kW)

Rotary Speed of Small Pulley (rpm) \ No. of Teeth of Small Pulley	20	22	24	26	28	30	32	34	36	38	40	44	48	50	56	60	64	72
Diameter of the Pitch Circle (mm)	50.93	56.02	61.12	66.21	71.30	76.39	81.49	86.58	91.67	96.77	101.86	112.05	122.23	127.32	142.06	152.79	162.97	183.35
100	0.16	0.17	0.19	0.21	0.23	0.26	0.31	0.41	0.44	0.48	0.51	0.56	0.60	0.63	0.70	0.74	0.78	0.89
200	0.32	0.35	0.39	0.42	0.45	0.50	0.59	0.69	0.78	0.85	0.91	0.99	1.07	1.14	1.23	1.35	1.40	1.57
400	0.65	0.71	0.77	0.84	0.90	0.95	1.09	1.25	1.37	1.48	1.59	1.72	1.86	1.94	2.16	2.30	2.43	2.71
600	0.96	1.06	1.16	1.25	1.35	1.45	1.53	1.70	1.86	2.02	2.17	2.37	2.55	2.66	2.95	3.12	3.30	3.66
800	1.29	1.41	1.54	1.67	1.80	1.93	2.06	2.18	2.31	2.51	2.69	3.02	3.16	3.27	3.64	3.83	4.08	4.75
870	1.40	1.54	1.68	1.82	1.96	2.10	2.24	2.38	2.51	2.66	2.86	3.16	3.36	3.48	3.90	4.13	4.44	4.98
1000	1.61	1.77	1.93	2.09	2.25	2.41	2.57	2.73	2.89	2.99	3.16	3.64	3.84	4.00	4.47	4.78	5.09	5.71
1160	1.86	2.05	2.24	2.42	2.61	2.79	2.98	3.16	3.35	3.53	3.84	4.08	4.44	4.62	5.17	5.52	6.48	7.28
1200	1.93	2.12	2.31	2.51	2.70	2.89	3.07	3.27	3.46	3.60	3.82	4.22	4.59	4.78	5.34	5.71	6.08	7.52
1400	2.25	2.45	2.70	2.94	3.15	3.37	3.59	3.80	4.03	4.25	4.47	4.90	5.34	5.55	6.20	6.62	7.04	8.68
1450	2.33	2.55	2.79	3.04	3.26	3.65	3.72	3.94	4.17	4.40	4.63	5.07	5.53	5.75	6.41	6.85	7.28	8.96
1500	2.41	2.64	2.89	3.15	3.37	3.72	3.84	4.07	4.31	4.55	4.78	5.25	5.71	5.94	6.62	7.07	7.51	9.25
1600	2.57	2.83	3.07	3.35	3.59	3.84	4.09	4.34	4.59	4.84	5.09	5.59	6.08	6.32	7.04	7.52	7.98	9.81
1750	2.81	3.08	3.36	3.64	3.92	4.20	4.47	4.74	5.01	5.28	5.56	6.09	6.63	6.88	7.68	8.17	8.70	10.6
1800	2.89	3.18	3.72	3.75	4.03	4.31	4.59	4.87	5.15	5.43	5.71	6.26	6.80	7.07	7.86	8.38	8.90	10.9
2000	3.20	3.52	4.01	4.15	4.47	4.78	5.09	5.40	5.71	6.01	6.32	6.93	7.52	7.81	8.68	9.24	9.81	11.9
2400	3.84	4.22	4.59	4.97	5.34	5.71	6.08	6.44	6.80	7.16	7.52	8.22	9.05	9.24	9.86	10.9	11.5	13.8
3000	4.63	5.20	5.62	6.02	6.52	6.81	7.32	7.76	8.22	8.71	9.02	9.84	10.7	11.1	12.2	12.6	12.9	14.6
3600		5.82	6.34	6.75	7.27	7.67	8.17	8.65	9.14	9.72	10.0	10.8	11.7	12.2	13.1	13.9	13.9	15.3
4000			7.06	7.48	8.14	8.46	9.00	9.60	10.0	10.7	11.0	11.7	12.7	13.2	14.0	14.7	14.9	15.8
5000				8.81	9.60	10.2	10.7	11.3	11.7	12.4	12.8	13.6	14.5	14.8	15.7			
6000				10.2	11.2	11.9	12.3	13.0	13.2	14.1	14.5	14.9	15.8	16.0				

* Endurance time will be reduced in [- - -] marked area. Please avoid if possible. If the belt width changes, multiply the compensation factors Kb from Table 29.
* [ ] The circumferential speed of pulley is 33(m/s)or more; a dynamic balance for the pulley is essential.

Table 47. Reference Transmission Capacity of UP5M Ps -Belt Width 10mm- (W)

Rotary Speed of Small Pulley (rpm) \ No. of Teeth of Small Pulley	12	14	16	18	20	22	24	26	28	30	32	36	40	44	48	50	60	72
Diameter of the Pitch Circle (mm)	19.10	22.28	25.46	28.65	31.83	35.01	38.20	41.38	44.56	47.75	50.93	57.30	63.66	70.03	76.39	79.58	95.49	114.59
20	10	12	15	17	19	21	24	26	29	31	34	39	45	51	58	61	78	101
40	19	23	28	32	36	40	45	49	54	59	64	74	85	96	108	114	147	187
60	27	32	39	45	50	56	63	69	76	83	90	104	119	135	152	161	206	267
100	41	50	60	69	78	88	97	107	118	128	139	162	185	210	236	249	321	420
200	76	92	111	128	145	162	180	198	215	237	257	298	342	388	436	460	592	774
400	141	170	206	236	267	299	332	366	401	437	474	550	631	715	804	849	1092	1430
500	172	207	251	287	325	364	405	446	488	532	577	670	769	871	979	1034	1330	1741
600	202	243	295	338	382	428	475	524	574	625	678	788	903	1024	1151	1216	1563	2045
800	260	314	380	436	492	552	613	675	740	806	875	1016	1164	1320	1483	1567	2016	2637
1000	316	382	463	531	600	672	747	822	901	982	1065	1238	1418	1609	1806	1909	2454	3210
1200	376	453	550	630	713	799	887	977	1070	1167	1265	1470	1685	1910	2146	2266	2913	3811
1400	436	526	637	730	826	924	1026	1132	1240	1351	1466	1702	1951	2212	2484	2625	3372	4409
1450		544	658	755	854	957	1061	1171	1283	1397	1516	1760	2017	2288	2569	2714	3488	4559
1500		561	681	780	883	988	1098	1209	1324	1444	1566	1819	2084	2364	2654	2803	3601	4707
1600		599	724	831	940	1052	1169	1287	1410	1537	1667	1935	2218	2514	2823	2984	3833	5007
1750		652	790	907	1025	1147	1275	1405	1539	1677	1817	2111	2420	2743	3080	3254	4178	5455
1800			813	931	1053	1179	1309	1443	1582	1724	1868	2171	2486	2820	3165	3344	4293	5605
2000			902	1032	1169	1309	1453	1601	1754	1912	2071	2407	2757	3124	3508	3707	4687	6201
2400			1068	1222	1386	1552	1720	1897	2077	2262	2453	2849	3261	3695	4146	4378	5485	7293
3000				1517	1714	1918	2130	2348	2570	2798	3034	3520	4027	4559	5108	5389	6614	8885
3600				1794	2029	2272	2519	2774	3039	3307	3584	4151	4743	5361	5996	6320	7629	10250
4000					2245	2513	2785	3067	3358	3655	3956	4577	5226	5895	6583	6932	8040	11069
5000					2747	3072	3404	3747	4090	4446	4807	5542	6301	7066	7843	8229	9048	
6000					3217	3585	3969	4359	4757	5154	5559	6376	7185	7995	8776	9159		
8000							5002	5455	5908	6361	6795	7624	8366	8993	9465	9619		
10000								6313	6747	7156	7518	8072	8349	8253				
12000								6824	7142	7359	7475	7316						
14000								6848	6882	6730								

* Endurance time will be reduced in [- - -] marked area. Please avoid if possible. If the belt width changes, multiply the compensation factors Kb from Table 29.

Table 48. Reference Transmission Capacity of UP8M Ps -Belt Width 15mm- (kW)

Rotary Speed of Small Pulley (rpm) \ No. of Teeth of Small Pulley	20	22	24	26	28	30	32	34	36	38	40	44	48	50	56	60	64	72
Diameter of the Pitch Circle (mm)	50.93	56.02	61.12	66.21	71.30	76.39	81.49	86.58	91.67	96.77	101.86	112.05	122.23	127.32	142.60	152.79	162.97	183.35
20	0.11	0.12	0.13	0.14	0.15	0.17	0.18	0.19	0.20	0.21	0.23	0.25	0.28	0.29	0.33	0.36	0.40	0.46
40	0.19	0.21	0.24	0.26	0.28	0.30	0.33	0.36	0.38	0.40	0.42	0.47	0.52	0.55	0.62	0.67	0.73	0.84
60	0.27	0.31	0.34	0.37	0.40	0.44	0.47	0.50	0.53	0.56	0.60	0.67	0.74	0.77	0.89	0.96	1.04	1.20
100	0.43	0.48	0.52	0.57	0.62	0.67	0.71	0.77	0.82	0.88	0.93	1.03	1.14	1.20	1.38	1.50	1.62	1.87
200	0.76	0.84	0.93	1.01	1.10	1.19	1.28	1.37	1.46	1.57	1.69	1.85	2.06	2.16	2.48	2.70	2.93	3.40
300	1.06	1.17	1.29	1.41	1.54	1.66	1.78	1.92	2.05	2.18	2.29	2.59	2.88	3.03	3.48	3.79	4.11	4.79
400	1.32	1.47	1.62	1.78	1.93	2.09	2.25	2.41	2.59	2.75	2.92	3.28	3.65	3.84	4.41	4.81	5.22	6.08
500	1.57	1.75	1.93	2.12	2.30	2.50	2.69	2.89	3.09	3.30	3.50	3.93	4.37	4.60	5.30	5.78	6.29	7.32
600	1.81	2.01	2.22	2.44	2.65	2.88	3.10	3.33	3.57	3.80	4.05	4.54	5.06	5.32	6.14	6.71	7.29	8.51
700	2.04	2.26	2.50	2.75	2.99	3.24	3.50	3.75	4.02	4.29	4.57	5.13	5.72	6.02	6.95	7.59	8.26	9.65
800	2.25	2.51	2.77	3.04	3.31	3.59	3.87	4.17	4.46	4.76	5.07	5.70	6.35	6.69	7.73	8.45	9.20	10.75
900	2.46	2.74	3.03	3.32	3.61	3.92	4.24	4.55	4.88	5.21	5.55	6.25	6.97	7.34	8.48	9.29	10.11	11.83
1000	2.66	2.96	3.28	3.58	3.91	4.24	4.58	4.93	5.28	5.64	6.02	6.78	7.56	7.96	9.22	10.08	10.99	12.88
1100	2.86	3.19	3.52	3.87	4.23	4.59	4.95	5.33	5.71	6.10	6.51	7.32	8.18	8.62	9.99	10.93	11.91	13.97
1200	3.06	3.42	3.78	4.15	4.53	4.92	5.31	5.72	6.13	6.55	6.98	7.87	8.79	9.26	10.74	11.76	12.83	15.05
1300	3.26	3.64	4.02	4.42	4.82	5.24	5.67	6.10	6.54	6.99	7.45	8.40	9.40	9.90	11.49	12.59	13.73	16.11
1400	3.46	3.86	4.27	4.69	5.12	5.57	6.01	6.47	6.95	7.43	7.92	8.94	9.99	10.53	12.23	13.40	14.62	17.17
1450	3.55	3.96	4.39	4.82	5.26	5.72	6.18	6.66	7.15	7.64	8.15	9.20	10.28	10.84	12.59	13.80	15.06	17.69
1500	3.65	4.07	4.51	4.95	5.41	5.87	6.35	6.85	7.35	7.85	8.38	9.46	10.58	11.15	12.95	14.20	15.50	18.22
1600	3.83	4.27	4.73	5.21	5.69	6.18	6.69	7.21	7.74	8.28	8.84	9.98	11.16	11.77	13.68	15.00	16.37	19.26
1750	4.11	4.59	5.08	5.59	6.12	6.64	7.19	7.75	8.32	8.91	9.50	10.74	12.03	12.69	14.75	16.19	17.68	20.81
1800	4.19	4.69	5.20	5.71	6.25	6.79	7.35	7.92	8.52	9.11	9.72	11.00	12.31	12.99	15.10	16.58	18.11	21.32
2000	4.56	5.09	5.65	6.21	6.79	7.39	8.00	8.63	9.28	9.93	10.61	11.99	13.44	14.18	16.51	18.14	19.82	23.37
2400	5.25	5.87	6.51	7.17	7.85	8.54	9.27	10.00	10.75	11.52	12.31	13.95	15.65	16.53	19.27	21.20	23.18	27.38
2800	5.91	6.61	7.34	8.09	8.87	9.66	10.48	11.32	12.18	13.06	13.97	15.84	17.81	18.81	21.97	24.19	26.49	31.35
3000	6.22	6.97	7.75	8.54	9.37	10.21	11.09	11.97	12.89	13.82	14.79	16.78	18.87	19.94	23.31	25.68	28.13	33.30
3600	6.93	7.79	8.66	9.56	10.49	11.45	12.44	13.46	14.50	15.57	16.66	18.94	21.33	22.56	26.44	29.15	31.97	37.94
4000	7.36	8.29	9.20	10.18	11.18	12.20	13.27	14.36	15.48	16.63	17.81	20.27	22.85	24.18	28.37	31.30	34.36	40.81
5000	8.29	9.34	10.41	11.52	12.68	13.87	15.10	16.38	17.68	19.02	20.40	23.26	26.29	27.84	32.75	36.20		
6000	9.05	9.05	11.41	12.65	13.95	15.28	16.66	18.08	19.55	21.06	22.61	25.85	29.24	31.02	36.56	40.46		

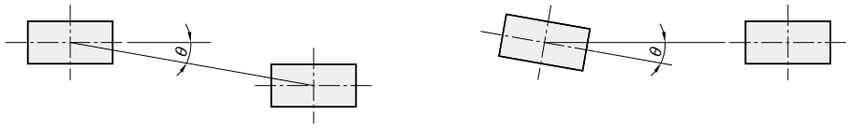
* Endurance time will be reduced in [- - -] marked area. Please avoid if possible. If the belt width changes, multiply the compensation factors Kb from Table 29.
* [ ] The circumferential speed of pulley is 33(m/s)or more; a dynamic balance for the pulley is essential.

Early failures and countermeasures

Abnormal Phenomena	Cause	Measures
Abnormal Wear of Belt Side Faces	· Pulley misalignment · Pulley shafts misalignments · Bent pulley flanges	· Realign · Correct shaft misalignments · Correct bent pulley flanges
Tooth Contact Pressure Surface Abnormal Wear	· Overload · Belt tension too high, too low	· Redesign with a wide belt or use larger belt pitch · Adjust initial belt tension
Belt abnormal wear on pulley contacting area	· Pulley tooth shape incorrect · Belt tension too high	· Adjust initial belt tension · Try to recreate belt systems by taking note of tooth tip radius
Broken/missing tooth	· Pulley diameter too small · Small pulley meshing 6 teeth or less · Shock loading exists	· Redesign · Increase small pulley tooth mesh or redesign · Avoid shock loading on belt · Increase belt width
Severed Core Wire	· Overload · Core wire decreased elasticity or corrosion · Induction of foreign matter · Excessive temperature	· Redesign · Check belt storage and shipping history/condision · Avoid shocks · Provide a belt cover · Lower environment temperature
Cracks on Backing Rubber	· Usage in low temperature · Pulley diameter too small	· Raise environment temp. · Increase pulley diameter
Heat Degradation of Rubber	· Rubber degradation due to high enviroment temperature	· Lower environment temperature
Rubber Swelling	· Contact with oils · Contact with water	· Avoid oil from contacting · Avoid water from contacting
Abnormal Wear of Pulley Teeth	· Overload · Belt tension too high · Pulley material too soft	· Redesign · Adjust initial belt tension · Apply surface hardening treatment on pulley or change pulley material
Pulley Circumference Wear	· Pulley service life has been reached · Belt tension too high (core wire visible on belt back side)	· Replace with a new pulley · Replace with new pulley and belt, and use lower belt tension
Abnormal Sound	· Belt tension too high · Overload · Pulley diameter too small · Pulley tooth shape incorrect	· Realign · Adjust initial belt tension · Redesign · Correct pulley tooth geometry
Apparent Belt Stretch	· Shaft center distance too small · Loose machine base	· Adjust to correct shaft distance · Reinforce machine base

About Pulley Alignments

Misaligned pulleys may cause early belt failure and flange damages.
Align as show below



•MXL/XL/L/H/S_M/MTS_M/T Series

Belt width (mm)	10	20	30≤
tanθ	5/1000	3/1000	2/1000

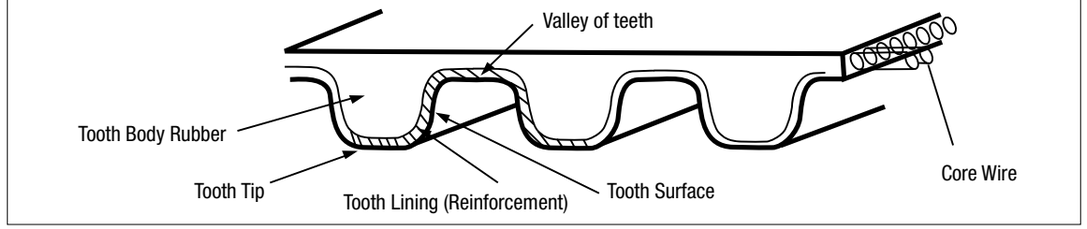
•P_M/UP_M

Belt width (mm)	≤30
tanθ	5/1000

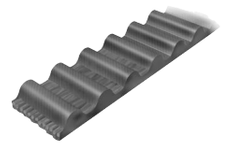
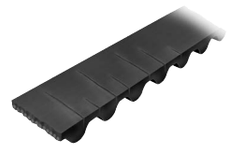
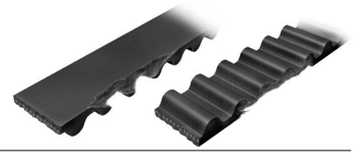
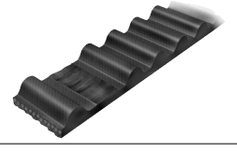
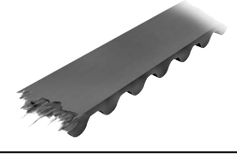
•_GT/EV5GT/EV8YU

Belt width (mm)	≤20	20<40
tanθ	6/1000	3/1000

Names of Belt Components



Examples of Belt Replacement Signs

Examples	Condition
1. When belt tooth reinforcement fabric is worn and rubber/core wire are exposed When tooth surface/grooves are worn and rubber/core wire are exposed	
2. When the backing rubber shows cracks due to hardening	
3. When cracks reaching the rubber are seen at tooth base	
4. Belt side faces are damaged due to wear	
5. When missing tooth can be seen	
6. When excessive wear can be seen on belt back side	
7. When belt or core wire are broken	

These are belt replacement timing guides. Early or periodical replacements are recommended even the signs shown above are not yet visible.