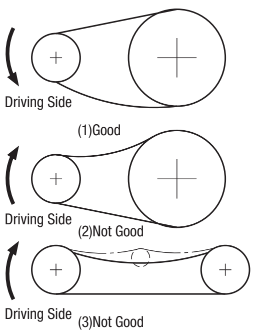
Installation Way

(A) Arrangement of Shafts

Horizontal Arrangement

Even when the shafts are arranged horizontally, the following points should be taken into account in terms of the rotary direction of the shafts. In (2) and (3) shown, elongation of the chain may prevent the chain links from leaving the sprocket teeth smoothly, resulting in biting. In (3) shown, the load bottom and slack top sides of the chain may come into contact with each other; to prevent this, use an idler or something equivalent.

Horizontal Arrangement

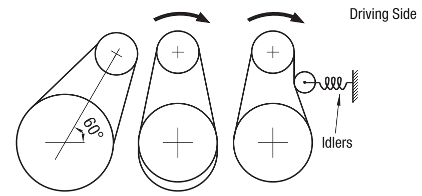


(Change the rotating direction or use an idler)

Vertical Arrangement

In (5) shown, an elongated chain may sag below the bottom sprockets. In this case, when a small sprocket is arranged below a large sprocket, the elongated chain may drop away from the small sprocket. To prevent this, the shafts should be arranged as in (4) , maintaining the angle at a maximum of 60°. When the mechanism in question or the installation space requires a vertical arrangement, place the small sprocket above the large sprocket and use an idler, etc. on the outside or inside as shown in (6) .

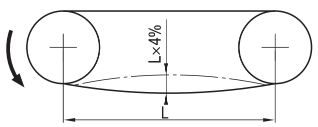
Vertical Arrangement



(B) Deflection

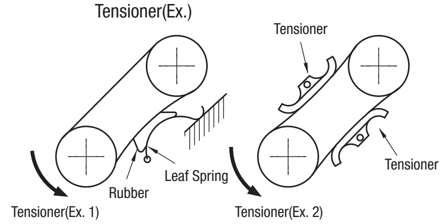
The deflection should normally be maintained at approximately 4% of the distance between the shafts, and approximately 2% in the following instances.

A. The shafts are arranged almost vertical transmission.
B. The distance between the shafts is 1 m or more.
C. The chain needs to be started and stopped frequently under heavy load.
D. The chain needs to be run in the reverse direction.



(C)Load Fluctuation

When the load varies during operation, install an initial tension either on the load or loose side of the chain. This can remove vibration and reduce the noise of the chain.



Lubrication

The service life of roller chains depends heavily on lubrication. Therefore, correct lubrication is extremely important. Today, as chains are increasingly run at higher speeds, they need to be lubricated more efficiently.

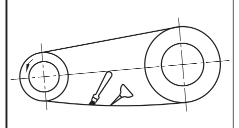
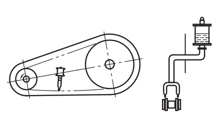
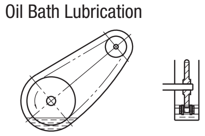
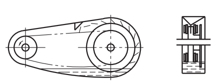
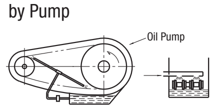
Benefits of Lubrication Oil

Oil applied into the space between pins, bushings and rollers forms oil film. Which then helps reduce wear of parts as well as absorb impact. Oil also cools down heat generated in the chain. Use good quality mineral oil to lubricate roller chains.

Recommended Lubricating Oil

Lubrication Method	A , B				C			
Temperature(℃) / Chain No.	-10 ~ 0	0 ~ 40	40 ~ 50	50 ~ 60	-10 ~ 0	0 ~ 40	40 ~ 50	50 ~ 60
CHE25~50	SAE10	SAE20	SAE30	SAE40	SAE10	SAE20	SAE30	SAE40
CHE60~80	SAE20	SAE30	SAE40	SAE50				

The lubrication methods(mentioned in the power transmission efficiency tables are based on the followings.)

Lubrication	Method	Service Interval and Oiling Quantity	Notes
A	Hand Oiling 	Apply oil by hand using a hand oiler or a brush, normally at least once everyday.	While slowly turning the chain, apply oil evenly 3~4 times onto the entire length of the chain. Be careful not to allow hands or clothing to be caught between the chain and the sprocket. When the mechanism is run for the first time after oiling, be careful to excess oil splashing over.
A	Drop Lubrication 	Oil the chain in a manner such that approximately 5~20 drops of oil are applied onto the chain per minute.	It is recommended that a simple casing be installed over the chain to prevent oil from splashing over.
B	Oil Bath Lubrication 	Dip the bottom of the chain approximately 10 mm below the oiled surface.	Use a leak-free oil container. Before installing the oil container, wash it carefully to remove dust, dirt and other foreign particles. Maintain the correct oil level. Do not overfill the container.
B	Rotating Plate Lubrication 	The chain is oiled by a rotating plate. Dip the plate approximately 20mm below the oil level. The wind velocity of the plate should be 200 m/min or faster.	
C	Forced Circulation Lubrication by Pump  Oil Pump	It is necessary to adjust the oil quantity appropriately to prevent overheating.	Use a leak-free oil container. Before installing the oil container, wash it carefully to remove dust, dirt and other foreign particles.

Allowable Stress for Tension Member

Check the belt that is selected for allowable stress, using the following procedures.

1. Calculating the Effective Tension

The effective tension of a belt can be calculated using Formula 1.

Formula1 $F=f(W_G+W_1+W_2)L+f(W_1+W_3)L\pm W_G\cdot H$

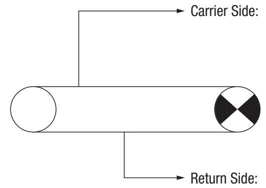
(Carrier Side) (Return Side) (Vertical Side)

F : Effective Tension
f : Rolling friction coefficient of rollers, or friction coefficient between belt and supports (Select from Table -1)
ωG : Weight of Carried Materials per Meter of Belt kg/m
$\omega 1$: Weight of belt per Meter kg/m
$\omega 2$: Weight of Carrier Rollers per Meter of Belt kg/m (Select from Table -2)
$\omega 3$: Weight of Return Rollers per Meter of Belt kg/m (Select from Table -2)
L : Conveyor Horizontal Length m
H : Vertical height (+Up angle, -Down angle)m

Table of f Values(Table 1)

Belt Surface in Contact with Supports	Smooth	Cloth Surfaced
Roller Support	0.05	0.05
Roller+Steel Plate Support	0.2	0.3
Steel Plate Support(SUS, SS)	0.4	0.5
Plywood Support	0.5	0.6

(When knife edges are used, add 0.2 to the above values in Table -1.)


Carrier Side: As the back of the belt has a cloth surface, avoid using iron plate or plywood as support as much as possible.

Return Side: When the front side of the belt has a cloth surface, or is coated with silicon or fluorocarbon resin, avoid using iron plate or plywood as support as much as possible. (Some types of belts identified by specific product names are compatible with the roller, table.)

Table of Roller Weight(Table 2)

Roller Dia.(mm)	Single Roller(kg/roller)	Allowable Load(kg/roller)
28.6	0.2	50

Table-2 shows the weight of the revolving parts of a roller that meets(JISB8805-1965).
For accurate calculation, check the actual weight of the roller being used.

2. Power Requirement

Formula 2 $P=\dfrac{F\cdot V}{6120}$

P : Power Requirement kW
F : Effective Tension N
V : Belt Speed m/min
6120 : 60×102(Constant)

3. Motor Power

Formula 3 $Pm=\dfrac{P}{\eta}$

Pm : Motor Power kW
P : Power Requirement kW
η : Mechanical Efficiency
(Standard Mechanical Efficiency Range:0.5~0.65)

For efficient operation, it is recommended to check the motor property if the motor for use has a power rating less than 0.1kW.

4. Using the Tension on the Loose Side to Calculate Maximum Tension

Formula 4 $F_{M1}=F\cdot K$

F_{M1} : Maximum Tension N
F : Effective Tension N
K : Coefficient

Using Value μ selected from Table-3 and the wrap angle (θ), select value K from Table-4.
(When the wrap angle (θ) is not listed in Table 4, Calculate from)

$$K=\frac{e^{\mu\theta'}}{e^{\mu\theta'}-1}$$

μ :Friction coefficient between driving pulley and belt(Select from Table-3)
e :Base of Natural Logarithm(2.718)
θ' :Radian ($\theta'=\theta\times\dfrac{2\pi}{360}$)

Table of Valuesμ(Table-3)

Pulley Surface / Surface Shape in Contact with Pulley		Smooth	Cloth Surfaced
Bare Steel Pulley	Dry	0.2	0.3
	Wet	0.15	0.2
Rubber Lagged Pulley	Dry	0.3	0.35
	Wet	0.2	0.25

Table of Value K Based on Wrap Angle(θ) (Table-4)

θ° \ μ	0.1	0.15	0.2	0.25	0.3	0.35	0.5
180	3.8	2.7	2.2	1.9	1.7	1.5	1.3
190	3.6	2.6	2.1	1.8	1.6	1.5	1.3
200	3.4	2.5	2.0	1.8	1.6	1.5	1.3
210	3.3	2.4	2.0	1.7	1.5	1.4	1.2
220	3.2	2.3	1.9	1.7	1.5	1.4	1.2
230	3.1	2.3	1.9	1.6	1.4	1.4	1.2

5. Using Pretension to Calculate Maximum Tension

Formula 5 $F_{M2}=F+B\cdot Tc$

FM2 : Maximum Tension N
B : Belt Width cm
TC : Initial Tension N/cm
(Select from Table-5)

Table of Tc Values(Table-5)

No. of Tension Members(No. of Plys)	1 Pc.
Initial Tension(N/cm)	1.5

Compare F_{M1} (Formula 4) and F_{M2} (Formula 5), and use the greater of the two values as the maximum tension FM.

6. Allowable Stress

Formula 6 $C\geq\dfrac{F_M}{B}$

C : Allowable Stress for Belt N/cm
FM : Effective Tension kg
B : Belt Width cm

When the allowable stress for the belt being used is equal to or higher than the maximum tension per 1cm width of the belt as expressed by Formula 6 above, the belt is suitable for use.