TSUBAKI MULTI FREE FLOW CHAIN SERIES

PAT.

MULTI FREE FLO

The Multi-Free Flow Chain series has a variety of uses for Free Flow Conveyors - The DECISIVE Free
The Multi-Free Flow series includes the Double-Plus Chain Series, the Single-Plus Chain Series (new
the aims and needs of the market and allows selection based on those needs by providing a wide

Double-Plus Chain Series	**Plastic Roller Double-Plus Chain, Steel Roller Double-plus**
	NEW **Direct Conveying Type (Urethane roller)**
Single-Plus Chain Series	***NEW*** **Center Roller type**
Conveyor Components and Parts Series	**Middle Section Aluminum Frame,** ***NEW*** **Specialized Alum**
	NEW **Drive and Driven Pallet Guide Rail, Sprocket, Return**

Double-Plus Chain Series (Wider Variety)

Maintenance Free Type

PAT. Pending

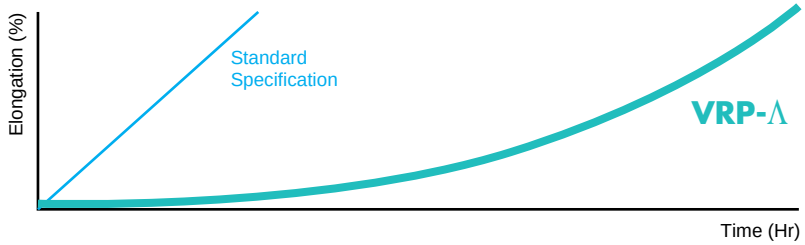
VRP-Λ (LAMBDA) RF2030VRP-Λ~ RF2080VRP-Λ
(Engineering Plastic Roller A~D Spec.)

Oil impregnated Sintered Bushings allow for long life without lubrication.

Features

Long Life without lubrication

Even without lubrication this chain has 5 times the normal wear elongation life of standard Double-Plus Chain.
The frequency of take-up adjustment has been reduced.



Low Noise

As the chain is oil-impregnated, noise doesn't occur between the pin and the bushing due to lubricant running out.
The perfect contributor to a quiet work area.

Line Pressure Reduction

Compared to standard specification chain, accumulation line pressure is reduced by 20% and, conveyed products and the load on the stopper become lighter.

Interchangeability

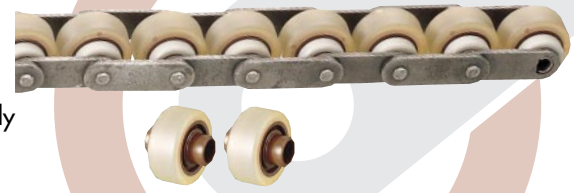
External measurements are identical to Standard Double-Plus Chain.
The frame and the sprocket remain the same and it is possible to replace just the chain.
* Only RF2030VRP-Λ (Lambda) pin diameter is different.

Direct Conveying Type

PAT. /PAT.Pending

*RF2030VRP-UA, -UB sizes only

Large diameter rollers are enclosed in a soft urethane covering to protect conveyed materials.



Features

Conveyed Materials Protection

This Double-Plus Chain allows materials to be placed and conveyed directly on the chain without the worry of scratching or damaging them.

*MULTI FREE FLOW CHAIN SERIES are patented and/or patent pending worldwide.

W CHAIN SERIES

Flow Chain.
series) and the Conveyor Components and Parts Series. These series' take into consideration variety from which to choose.
Chain, Large size Double-Plus, *NEW* Maintenance Free type (VRP-Λ),

inum Drive and Driven Section Frame, Middle Section Pallet Guide Rail, Guide, Conveyor Components

Single-Plus Chain (New Release)

Center roller type PAT.

*****RF2040CR ~ RF2060CR**

Most suitable for high accumulation Storage and Stock Conveyors.

Features

Single-Plus

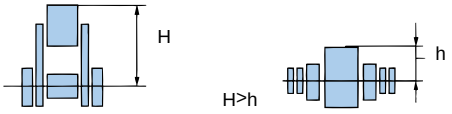
Chain speed and conveyed material's speed is identical (1:1). (Not Double-Plus Chain)

Stability

Compared with a Top Roller Chain, the center of gravity is lower. As the materials are placed on rollers on each side, stable conveying is possible.

Interchangeability

External measurements are the same as standard Double-Plus Chain. The steel rail aluminum frame, for Double-Plus Chain, can be used.



Top Roller Chain　　Center Roller Chain

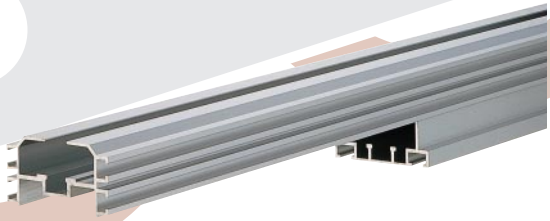
Conveyor Components and Parts Series (Series Expansion)

Specialized Aluminum Drive section and Driven Section Frames

Features

Notched Processed

Specialized Aluminum Drive and Driven Section Frames have been completed and are now available. They are easier to use as additional modifications by the customer are unnecessary.



*MULTI FREE FLOW CHAIN SERIES are patented and/or patent pending worldwide.

Improved Productivity
Improved Work Environment

Features of Double-Plus Chain

1.Lower conveyor production costs using standard parts

A large number of Double-Plus chains, sprockets, frames (Specialized aluminum drive and driven section frames have been added), guide rails and standard parts of conveyor components are being made available.

2.High grade Conveyor realization

High speed conveying and low noise

Chain speed is 1/2.5 (40%) of conveying speed. Moreover, it is quiet when used with an Engineering Plastic Roller. (Compared to Side Roller Chain and Top Roller Chain it is 15Db quieter)

Safe and Stable

With this chain's design, safety is improved as only the roller protrudes from the top of the Aluminum frame. Moreover, with a Snap cover attached, the problem of parts falling into the conveyor is eliminated.

Rapid conveying

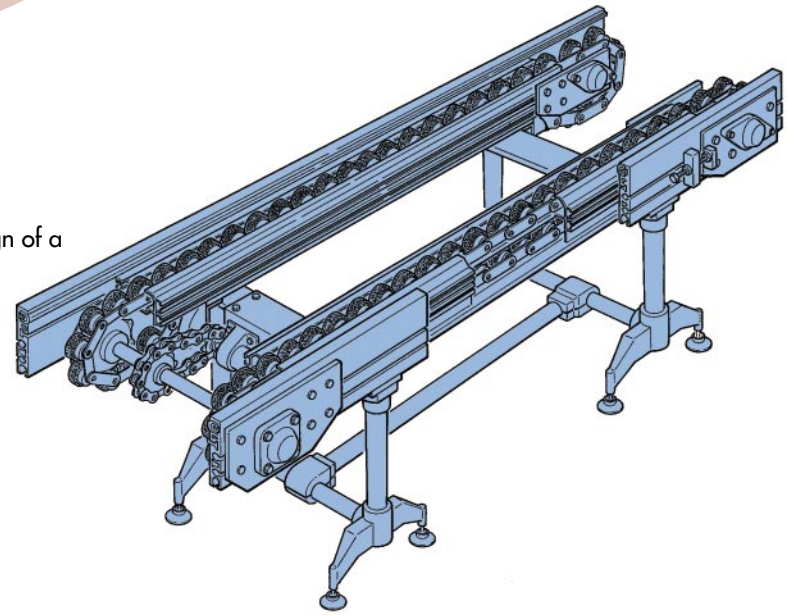
Little time loss after the product is released from the stopper. (Engineering Plastic Roller B & D)

Maintenance Free VRP-Λ

Lubrication-free and long life use

3.Wide Variety

From the combination of various components the design of a Free Flow Conveyor is simple.
A deluxe parts line-up.

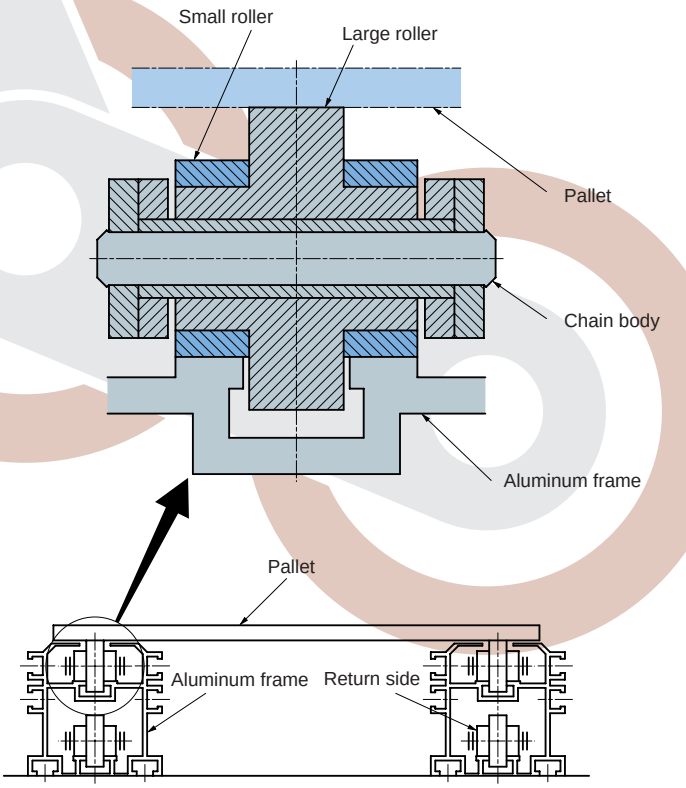


Examples of Use (Conveyed materials)

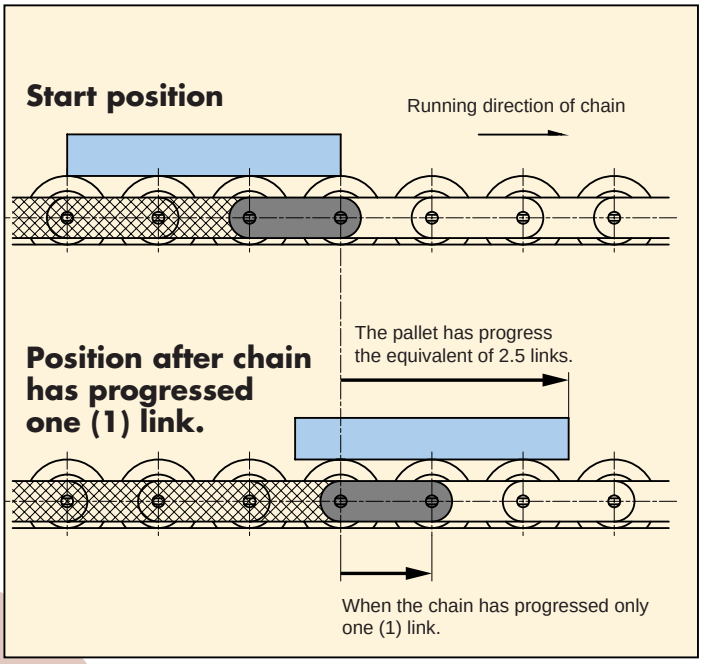
General	Gas Instruments, stove parts, vending machines, instruments, tabletops, plywood, food products, plastic containers, drink products, health products, detergents, cosmetics and medical machines.
Household appliances	TV's, cathode ray tubes, VTR's, microwave ovens, refrigerators, rice cookers, air-conditioners, fan heaters, computers, amplifiers, telephones, CD's, motors.
Electronics	Printing plates, cassette cases, magnetic disks, tape heads, electronics parts.
Automotive	Power transmission parts, carburetors, radiators, battery parts, fuse boxes.

The principle of 2.5 Free Flow speed

(Center Roller type is Single-Plus)

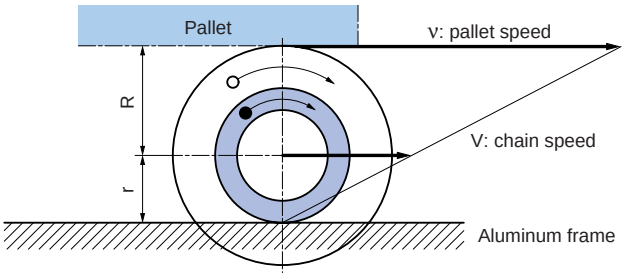


Position of chain and pallet during conveying



Conveying

Friction between the large roller (○) and the small roller (●) makes them rotate together. The difference in the roller's diameters causes the speed of the conveyed material to be 2.5 times the speed of the chain.



Chain speed: V Small roller radius: r
Pallet speed: v Large roller radius: R

When the chain runs at V speed, the peripheral speed of the small roller circumference becomes V.
At this time, because the large roller and the small roller are rotating at the same radial speed, the large roller circumference peripheral speed, at more than the ratio of half the diameter, becomes (R/r) · V.
Consequently, conveying speed v, becomes a combination of peripheral speed (R/r) · V and chain speed V.

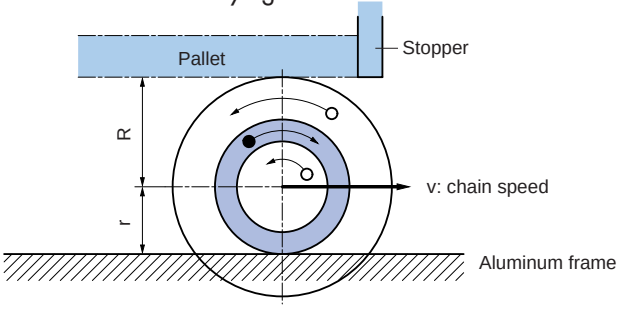
$$v=\left(\frac{R}{r}\right)\cdot V+V$$

$$v=\left(\frac{R}{r}+1\right)\cdot V$$

From the radius ratio
(R/r) ≒ 1.5 therefore v ≒ (1.5 + 1) · V ≒ 2.5 V

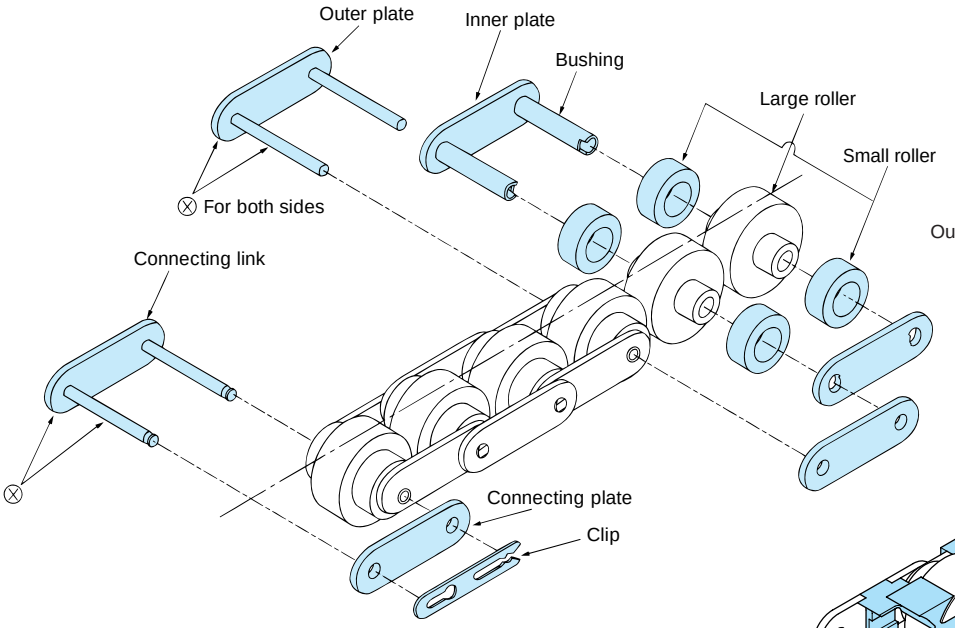
Accumulation

So as to have a braking force on the large roller (○), there is slip between the large roller and the small roller (●) that allows free flow conveying.

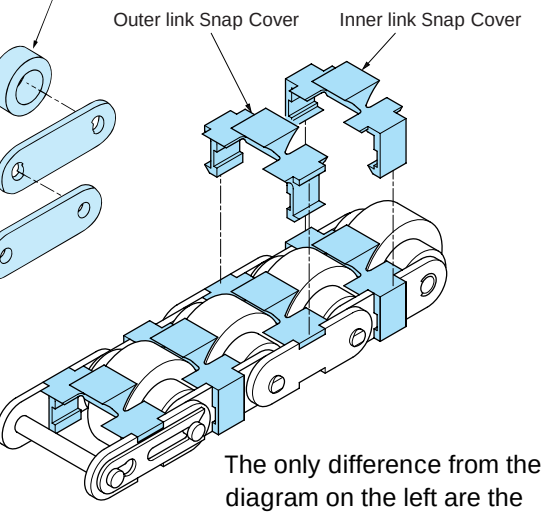


Construction

Double-Plus Chain PAT.

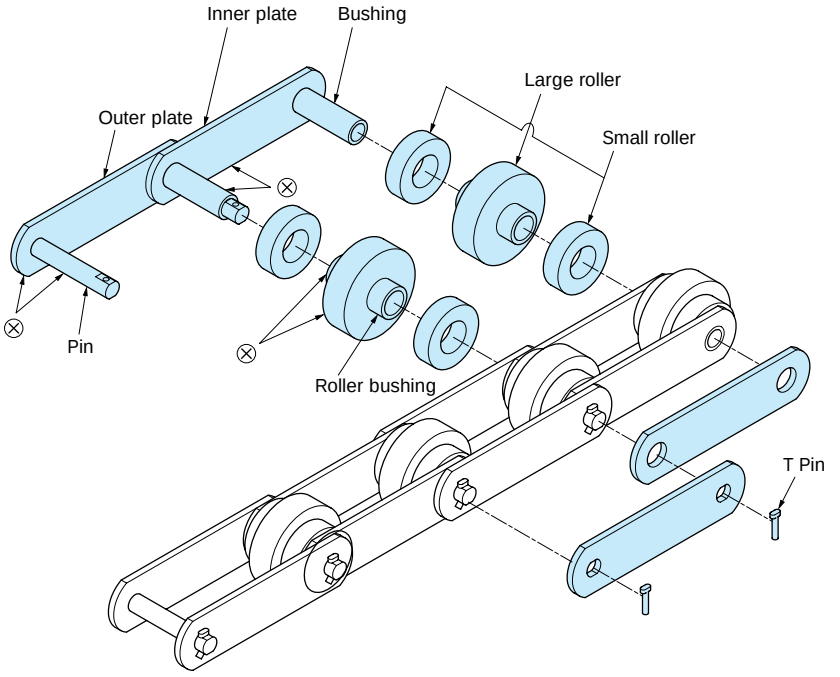


Double-Plus Chain with Snap Cover PAT.



The only difference from the diagram on the left are the dimensions of the Snap Cover plate. The Snap Cover can be attached and detached.

Double-Plus Chain Large size series



Loose Fittings

When connecting the shaft (Pin and Bushing) and the hole, always fit them loosely. The diameter tolerance of the hole should always be the upper diameter tolerance level of the shaft.

Tight Fittings

When connecting the shaft (Pin and Bushing) and the hole, always fit them tightly. The diameter tolerance of the hole should always be the lower diameter tolerance level of the shaft.

⊗ Tight fitting. Other parts are loose fitting.

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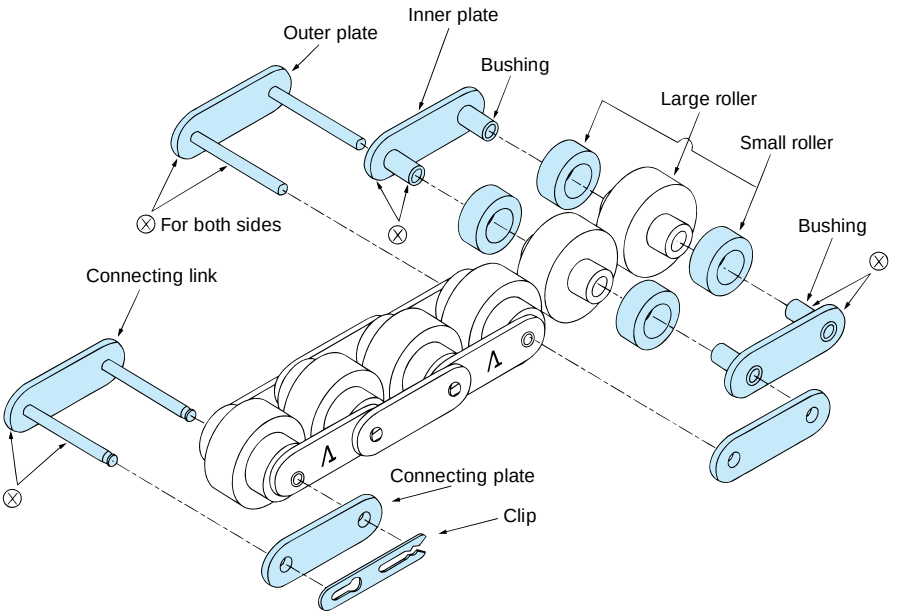
■ Double-Plus Lambda (VRP-Λ)

PAT. Pending NEW



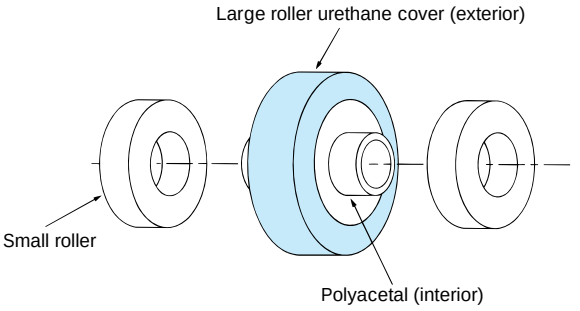
- Oil impregnated sintered bushings have been adopted.
- The bushing has been press-fitted into the left and right inner plates. (Bushing is divided)
- The pin is specially nickel-plated.

■ Urethane Roller (–UA, –UB)

PAT./PAT. Pending NEW

RF2030VRP-UA, -UB

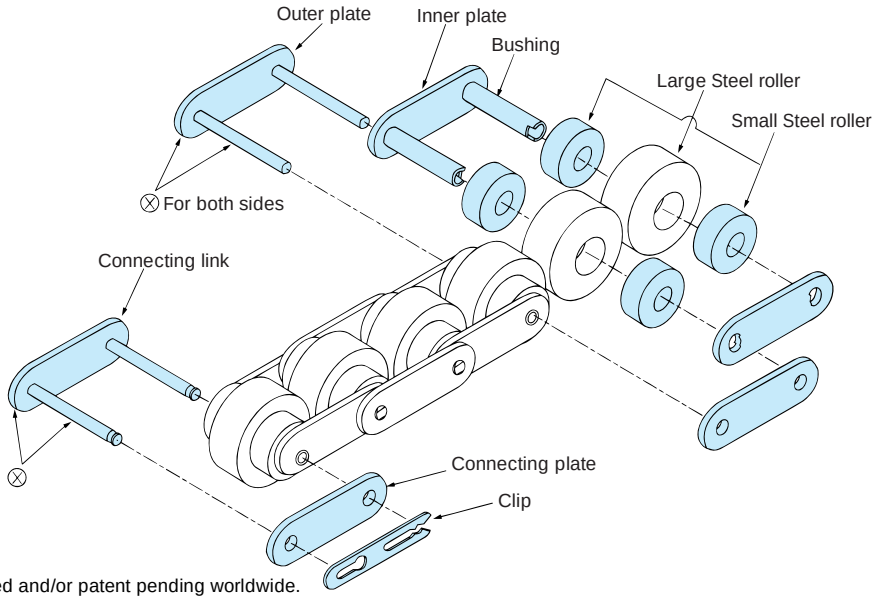
Only the large roller differs from Double-Plus Chain.



■ Center Roller Chain (CR)

PAT. NEW

The roller shape differs from the Double-Plus Chain roller; the large and small rollers are independent.



⊗ Tight fitting. Other parts are loose fitting.

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1 Chain Type (For the large size series please refer to page 17)

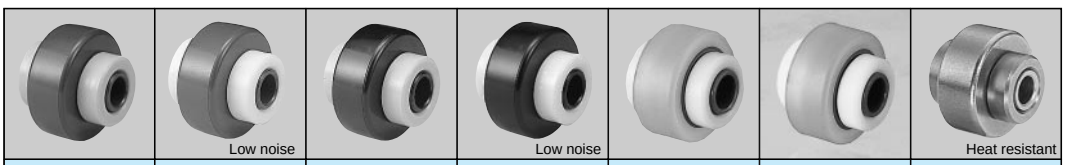
Suitable selections based on use can be made through combinations (Shown below as ○) of the chain body (4 types) and the rollers (7 types). Double-Plus Chain with Snap Cover has the same combinations.

Specification / Materials / Use \ Roller Type	Engineering Plastic Roller				Steel Roller	*Urethane Cover	
	VRP-A Standard	VRP-B High Friction	VRP-C Electro-conductive	VRP-D Electro-conductive High Friction	VR Steel	VRP-UA Standard	VRP-UB High Friction
Standard Steel General use	○	○	○	○	○	○	○
Hard Chrome (Cr.) Plating HCP Clean room use Avoid rusty conditions	○	○	○	○		○	○
Stainless Steel SS (SUS304) Recommended for non-magnetic and anti-corrosive use	○	○	○	○		○	○
Lubrication-free L (Chain body is standard spec.) Unable to use lubrication or don't wish to use lubrication.	○	○	○	○		○	○

*RF2030VRP only

2 Roller Use Classification (For Center Roller please refer to page 11)

Specifications	Roller		Application	Lubrication	Environment
	Large (Color)	Small (Color)			
VRP-A Standard	Standard (Brown)	Standard (Grey)	General use 10Db quieter than Plastic Side Chain	Use non-lubricated. However please refer to page 24 (Attention) if intending to use for long periods of time. If using lubrication-free specification Λ (Lambda), lubrication is unnecessary.	Even if the chain body is HCP or SS, as Engineering Plastic Rollers are being used, the chain cannot be used in areas where it may become wet.
VRP-B High friction		High friction (Cream)	Rapid response Low noise		
VRP-C Electro-conductive	Electro-conductive (Black)	Standard (Grey)	Individual volume surface resistance ratio 10^6 Ω cm		
VRP-D Electro-conductive High friction		High friction (Cream)	Individual volume surface resistance ratio 10^6 Ω cm Rapid response		
VRP-UA Standard	Urethane (Transparent)	Standard (Grey)	Direct conveying		
VRP-UB High friction		High friction (Cream)	Direct conveying Rapid response		
VR Steel	Steel	Steel	High load	Necessary	Will rust in wet areas.



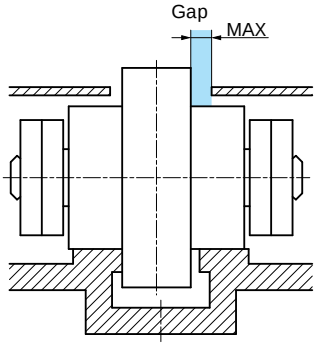
3 Double-Plus Chain with Snap Cover

1. Prevention of parts falling within the frame

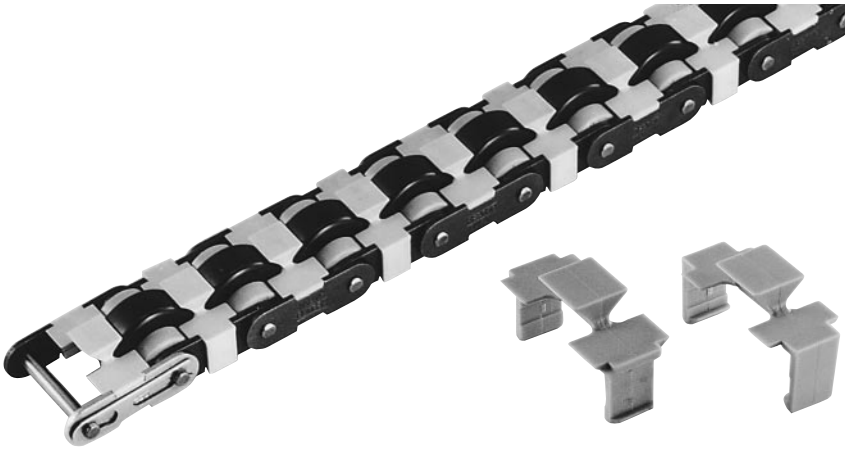
The Snap Cover prevents bolts, screws and other materials from falling or becoming wedged between the rollers. The Snap Cover is light gray and made from Engineering plastic.

2. Spaces between the Frame and the Snap Cover.

As spaces between the Frame and the Large Roller (Snap Cover) are narrow, parts cannot fall in. However please check using the actual chain.



Size	Max. Gap
RF2030VRP-SC	1.5
RF2040VRP-SC	2.2
RF2050VRP-SC	2.5
RF2060VRP-SC	3.5
RF2080VRP-SC	4.7

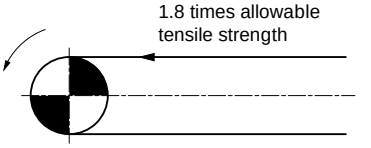


3. Conveying ability

Conveying ability and durability of Double-Plus Chain does not change with the installation of the Snap Cover.

4 Double-Plus Chain with Steel Rollers

(1) Compared to Engineering Plastic Chain, heavy load conveying is possible.
(2) Maximum operating temperature is 150°C (302°F). Please use a lubricant suitable for the operating temperature.
(3) Compared to chain with steel side rollers or Top rollers, operating noise is 10Db less. This is because chain speed becomes 1/2.5 of the conveying speed.



5 Aluminum Frame

(1) Aluminum Frame is for Chain with Engineering Plastic Rollers.

(2) Aluminum Frame with Steel Rail
The small roller on the aluminum frame conveying side runs on the steel rail (refer to the dimension diagram).
- Double-Plus Chain with Engineering Plastic Roller
- Double-Plus Chain with Steel Roller
- Center Roller Chain

(3) Specialized Aluminum Drive section and Driven Section Frames
To receive the chain return part, the frame has been cut processed.
Standard length: 1m (All sizes)
The Aluminum Frame and Aluminum Frame with Steel Rail are both well stocked.

6 Pallet Guide Rail

(1) The rail attached to the side of the Aluminum frame that guides the pallet

(2) Rails for use with the Drive section, Middle section and Driven section are available.

7 Plastic Rail

(1) So the pallet slides smoothly, attach the plastic rail to the pallet guide rail.

(2) Rails for use with the Drive section, Middle section and Driven section are available.

8 Return Guide

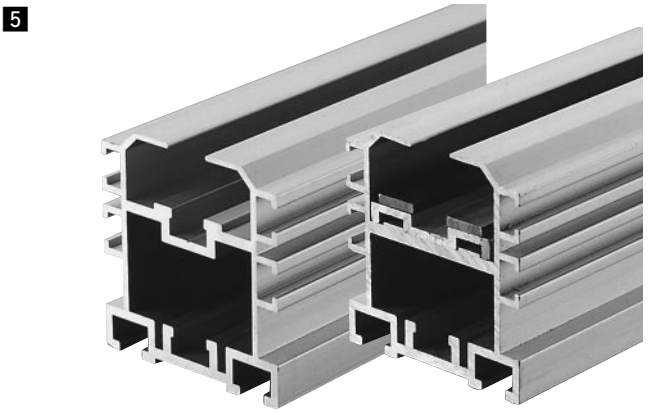
(1) Attached to either end of the frame it guides the returning Double-Plus Chain.

9 Bracket

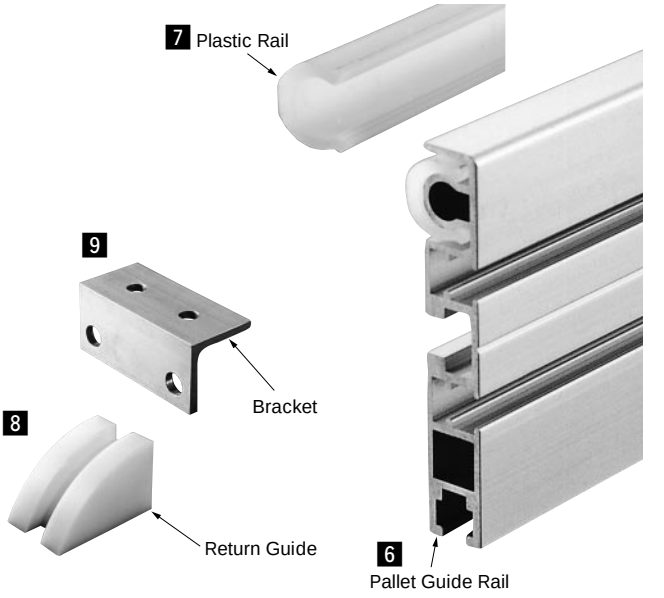
(1) Used to attach the return guide.

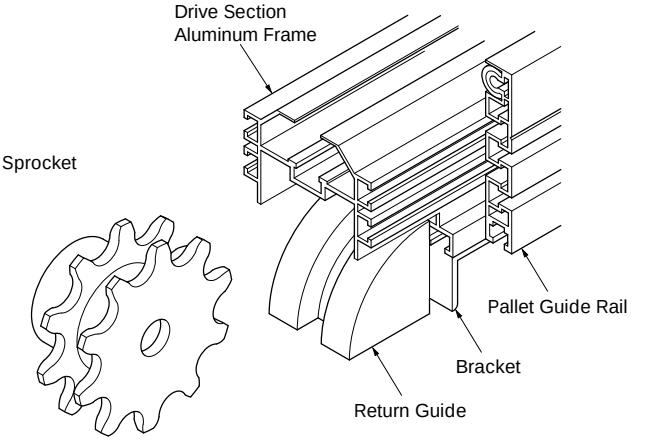
10 Frame Joint

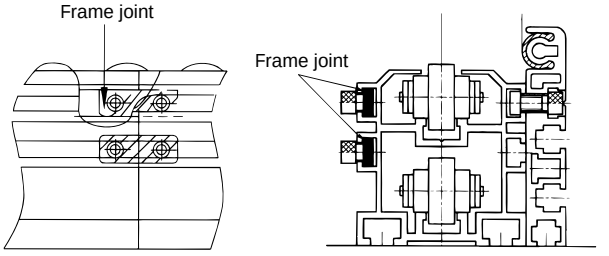
(1) Nut-like joint part that connects frame sections.



Aluminum Frame for use with Drive section and Driven Section



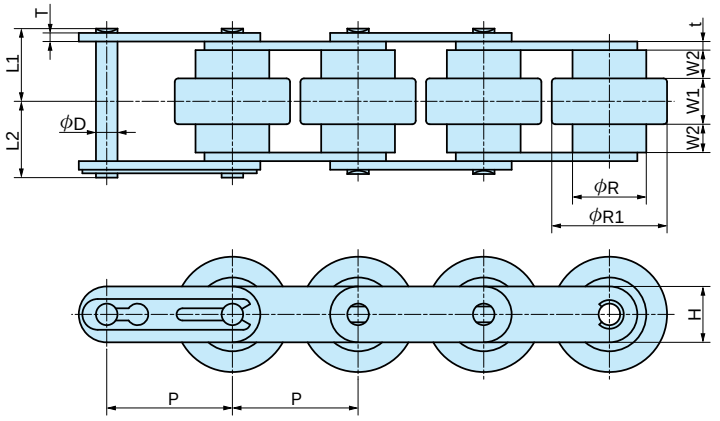




Dimensions

Double-Plus Chain ·····

Lubrication-free Specification Λ Lambda, Urethane Roller **Product expansion**



Model Identification

RF2040VRP-SS-A

Chain Size

VRP: Plastic Roller
VR: Steel Roller

Chain specifications
Standard ·····No symbol
Non-lubricated ·····Λ
Hard Chrome Plating ··HCP

Plastic Roller Specification
A, B, C or D
UA, UB (RF2030 only)
(Steel Roller has no symbol)

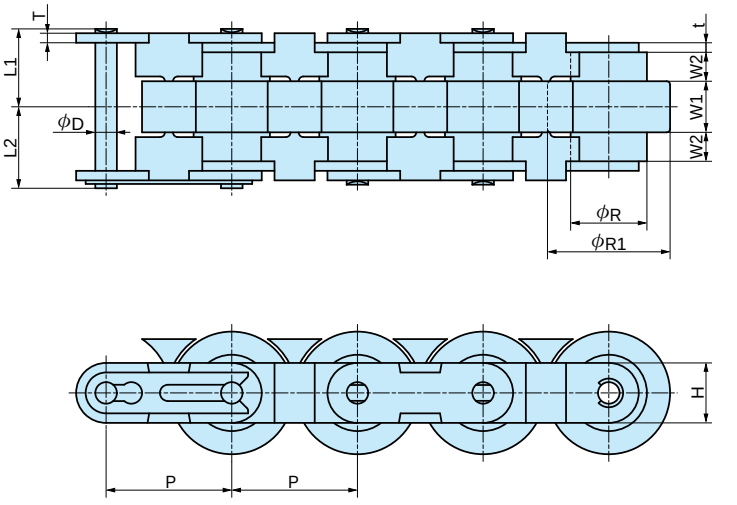
Note: 1. Made to Order product
2. RF2080VRP Connecting link is a cotter pin type
3. For Λ Lambda type, the bushing is not notched.

Chain Size		Pitch P	Roller		Width		Plate			Pin			Approx. Mass kg/m		No. Links/ Unit
Engineering Plastic Roller	Steel Roller		R	R1	W1	W2	t	T	H	D	L1	L2	Engineering Plastic Roller	Steel Roller	
RF2030VRP	RF2030VR	19.05	11.91	18.3	8.0	4.0	1.5	1.5	9.0	3.59 (3.00)	12.05	13.25	0.6	1.4	160
RF2040VRP	RF2040VR	25.40	15.88	24.6	10.3	5.7	2.0	1.5	12.0	3.97	15.8	17.0	1.0	2.5	120
RF2050VRP	RF2050VR	31.75	19.05	30.6	13.0	7.1	2.4	2.0	15.0	5.09	19.55	21.25	1.4	3.7	96
RF2060VRP	RF2060VR	38.10	22.23	36.6	15.5	8.5	3.2	3.2	17.2	5.96	24.5	26.4	2.0	5.6	80
RF2080VRP	—	50.80	28.58	48.0	20.0	15.0	4.0	4.0	23.0	7.94	35.8	38.0	3.9	—	60

The above chart's "chain size" is not the complete name. When ordering please refer to the 'Model Identification Chart'.
The value in the brackets ( ), is the dimension of RF2030VRP-Λ.

Double-Plus Chain with Snap Cover ·····

Lubrication-free Specification Λ Lambda, Urethane Roller **Product expansion**



Model Identification

RF2040VRP-SS-A-SC

Chain Size

VRP: Plastic Roller
VR: Steel Roller

Chain specifications
Standard ·····No symbol
Non-lubrication ·····Λ
Hard Cr. Plating ····HCP
Stainless Steel ·····SS

With Snap Cover

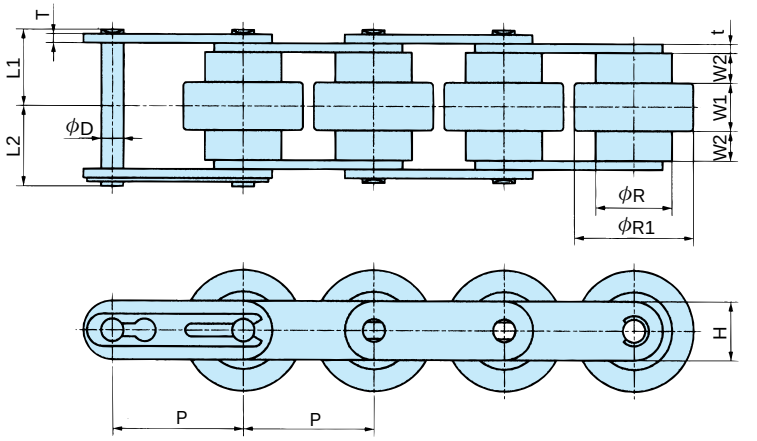
Plastic Roller Specification
A, B, C or D
UA, UB (RF2030 only)
(Steel Roller has no symbol)

Note: 1. Made to Order product.
2. This chain is specialized for Snap Cover use.
3. The Snap Cover cannot be attached to the above non-lubrication Double-Plus chain.
4. Offset link is not available.

Chain Size		Pitch P	Roller		Width		Plate			Pin			Approx. Mass kg/m		No. Links/ Unit
Engineering Plastic Roller	Steel Roller		R	R1	W1	W2	t	T	H	D	L1	L2	Engineering Plastic Roller	Steel Roller	
RF2030VRP-SC	RF2030VR-SC	19.05	11.91	18.3	8.0	4.0	1.5	1.5	9.0	3.59 (3.00)	12.05	13.25	0.6	1.4	160
RF2040VRP-SC	RF2040VR-SC	25.40	15.88	24.6	10.3	5.7	2.0	1.5	12.0	3.97	15.8	17.0	1.0	2.5	120
RF2050VRP-SC	RF2050VR-SC	31.75	19.05	30.6	13.0	7.1	2.4	2.0	15.0	5.09	19.55	21.25	1.4	3.7	96
RF2060VRP-SC	RF2060VR-SC	38.10	22.23	36.6	15.5	8.5	3.2	3.2	17.2	5.96	24.5	26.4	2.0	5.2	80
RF2080VRP-SC	—	50.80	28.58	48.0	20.0	15.0	4.0	4.0	23.0	7.94	35.8	38.0	3.9	—	60

The above chart's "chain size" is not the complete name. When ordering please refer to the 'Model Identification Chart'.
The value in the brackets ( ), is the dimension of RF2030VRP-Λ.

Center Roller Chain



Model Identification

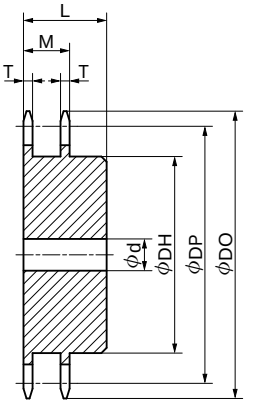
RF2040CR

Chain Size
Roller material: Steel
Center Roller

Chain Size	Pitch P	Roller		Width		Plate			Pin			Approx. Mass kg/m	No. links/Unit
		R	R1	W1	W2	I	T	H	D	L1	L2		
RF2040CR	25.40	15.88	24.6	10.3	5.7	2.0	1.5	12.0	3.97	15.8	17.0	2.5	120
RF2050CR	31.75	19.05	30.6	13.0	7.1	2.4	2.0	15.0	5.09	19.55	21.25	3.7	96
RF2060CR	38.10	22.23	36.6	15.5	8.5	3.2	3.2	17.2	5.96	24.5	26.4	5.6	80

Made to Order products

Sprocket



Model Identification

RF2030VRP-10T-SC

Chain with Snap Cover
No. of teeth: 10
Chain Size

Sprocket Model	Type	No. of Teeth	Pitch Diameter DP	Outer Diameter DO	Tooth Thickness T	Pilot Hole d	Hub		M	Material	Approx. Mass kg
							Diameter DH	Length L			
RF2030VRP-10T-SC	B	10	61.65	63	3.0	12.7	37	25	15.3	S38C	0.2
RF2040VRP-10T-SC	B	10	82.20	85	4.0	16	52	40	20.4	S38C	0.8
RF2050VRP-10T-SC	B	10	102.75	107	5.0	16	66	45	25.5	S38C	1.5
RF2060VRP-10T-SC	B	10	123.30	128	6.0	19	81	50	30.5	S38C	2.5
RF2080VRP-10T-SC	B	10	164.39	172	12.0	23	110	67	47.5	S38C	7.0

Attention: **Bolded items are stock items;** Non-bolded items are Made to Order.

■ Max. Allowable Tensile Strength ····· With Plastic Roller

Size / Chain Specification / Plastic Roller Specification		Max. Allowable Tensile Strength kN (kgf)		Operating Temperature
		A, UA, C Specification	B, UB, D Specification	
RF2030VRP RF2030VRP-SC	Standard	0.55 { 56}	0.27 { 28}	–10°C ~ +60°C (+14°F ~ +140°F)
	Lubrication-free			
	Hard Cr. Plating			
	Stainless Steel	0.27 { 28}		
RF2040VRP RF2040VRP-SC	Standard	0.88 { 90}	0.44 { 45}	
	Lubrication-free			
	Hard Cr. Plating			
	Stainless Steel	0.44 { 45}		
RF2050VRP RF2050VRP-SC	Standard	1.37 {140}	0.69 { 70}	
	Lubrication-free			
	Hard Cr. Plating			
	Stainless Steel	0.69 { 70}		
RF2060VRP RF2060VRP-SC	Standard	2.06 {210}	1.03 {105}	
	Lubrication-free			
	Hard Cr. Plating			
	Stainless Steel	1.03 {105}		
RF2080VRP RF2080VRP-SC	Standard	5.30 {540}	2.65 {270}	
	Lubrication-free			
	Hard Cr. Plating			
	Stainless Steel	2.65 {270}		

■ Max. Allowable Tensile Strength ····· With Steel Roller

Size	Max. Allowable Tensile Strength kN (kgf)	Operating Temperature
RF2030VR	0.98 {100}	–10°C ~ +150°C (+14°F ~ 302°F) { When operating in temperatures over +60°C (140°F) please use a 'High Temperature Use' lubricant. }
RF2040VR	1.57 {160}	
RF2050VR	2.45 {250}	
RF2060VR	3.73 {380}	

■ Max. Allowable Tensile Strength ····· Center Roller Chain

Size	Max. Allowable Tensile Strength kN (kgf)	Operating Temperature
RF2040CR	1.57 {160}	–10°C ~ +150°C (+14°F ~ 302°F) { When operating in temperatures over +60°C (+140°F) please use a 'High Temperature Use' lubricant. }
RF2050CR	2.45 {250}	
RF2060CR	3.73 {380}	

For Middle Section Frame

Aluminum Frame

(Chain with Engineering Plastic Roller)

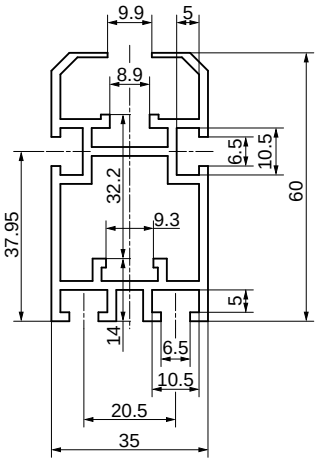
Material: Aluminum

Model

RF2030VRP-R3L

Standard Length: 3m

Approx. Mass: 1.4 kg/m



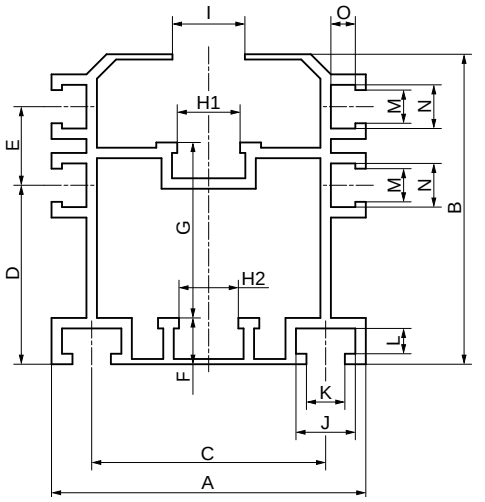
Model

RF2040 · RF2050 · RF2060VRP-R4L

Standard Length: 4m

Dimensions and Approx.

Mass: See chart below



■ For the attachment position of the Steel Rail refer to the ‘Handling Guide’

Aluminum Frame with Steel Rail

Material: Aluminum

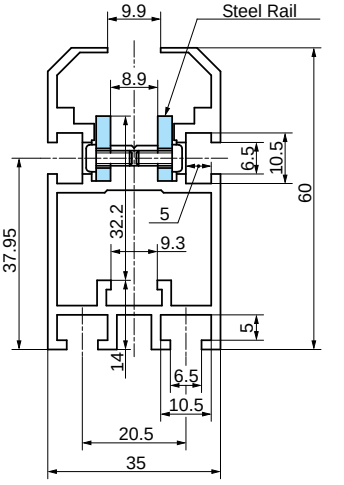
Steel Rail = SS400

Model

RF2030VRP-R3LS

Standard Length: 3m

Approx. Mass: 2.2 kg/m



Model

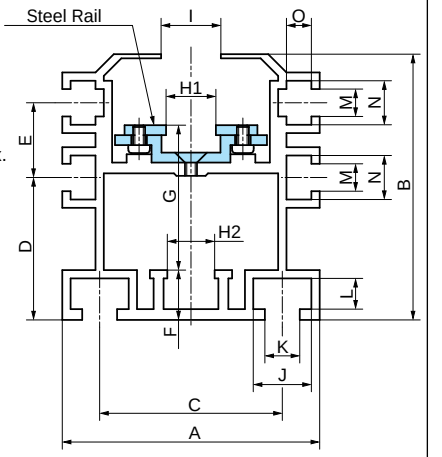
RF2040 · RF2050 ·

RF2060VRP-R4LS

Standard Length: 4m

Dimensions and Approx.

Mass: See chart below

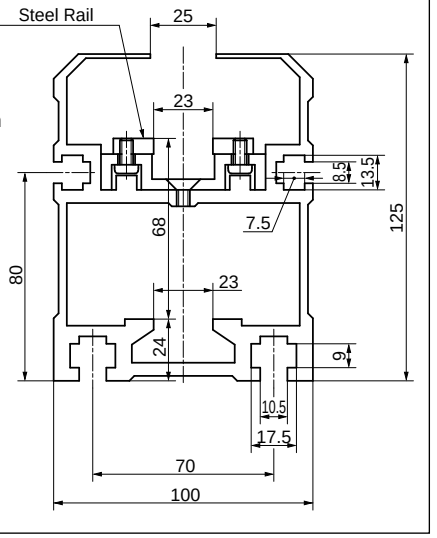


Model

RF2080VRP-R3LS

Standard Length: 3m

Approx. Mass: 9.9 kg/m

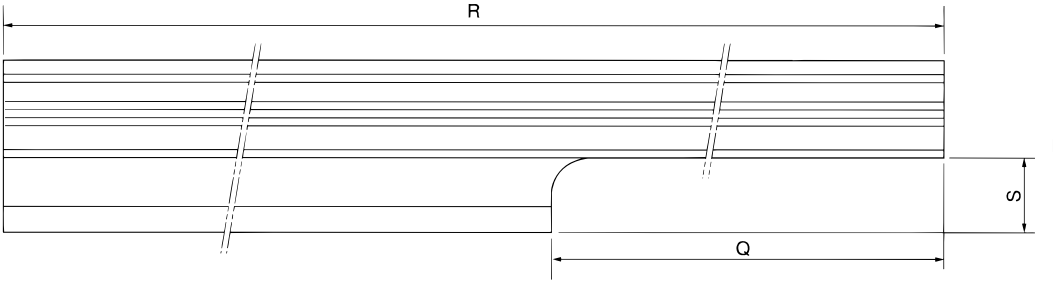


Aluminum Frame Model		A	B	C	D	E	F	G	H1	H2	I	J	K	L	M	N	O	Approx. Mass kg/m	
Aluminum Frame	With Steel Rail																	Aluminum Frame	With Steel Rail
RF2040VRP-R4L	RF2040VRP-R4LS	63	66	44.5	35.25	18.5	13	34.9	11.4	12	13.5	13.5	8.5	7.5	6.5	10.5	5.0	2.6	3.7
RF2050VRP-R4L	RF2050VRP-R4LS	78	80	55.5	41.75	23.0	15	43.0	14.3	15	16.5	17.5	10.5	9.0	8.5	13.5	7.5	3.6	5.0
RF2060VRP-R4L	RF2060VRP-R4LS	95	91	72.5	51.25	23.5	15	50.5	17.2	18	19.5	17.5	10.5	9.0	8.5	13.5	7.5	4.2	5.9

For Drive Section Frame and Driven Section Frame

NEW

- Section shape, materials and dimensions are the same as the Middle Section Frame.
- For Drive section and Driven Section the “Q” dimension is different.
- For the attachment position of the Steel Rail refer to the ‘Handling Guide’



Rail side surface diagram

Drive Section Frame and Driven Section Frame Model				Q		Standard Length R	S	Approx. Mass kg/m	
Aluminum Frame		Frame with Steel Rail						Aluminum Frame	With Steel Rail
Drive Section	Driven Section	Drive Section	Driven Section	Drive Section	Driven Section				
RF2030VRP-R1LK	RF2030VRP-R1LJ	RF2030VRP-R1LSK	RF2030VRP-R1LSJ	210	80	1 m	25	1.3	2.1
RF2040VRP-R1LK	RF2040VRP-R1LJ	RF2040VRP-R1LSK	RF2040VRP-R1LSJ	300	100	1 m	25	2.4	3.5
RF2050VRP-R1LK	RF2050VRP-R1LJ	RF2050VRP-R1LSK	RF2050VRP-R1LSJ	340	120	1 m	30	3.4	4.8
RF2060VRP-R1LK	RF2060VRP-R1LJ	RF2060VRP-R1LSK	RF2060VRP-R1LSJ	430	130	1 m	40	4.0	5.7
—	—	RF2080VRP-R1LSK	RF2080VRP-R1LSJ	550	200	1 m	60	—	9.5

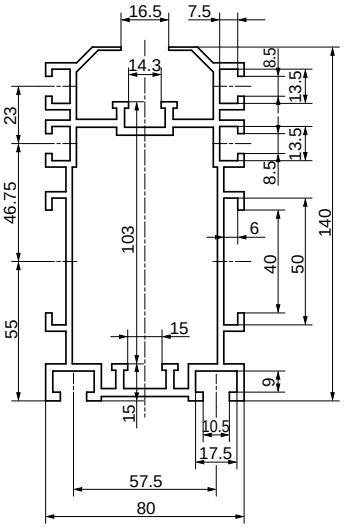
Stock item

Other Aluminum Frames (For Middle Section)

Aluminum Frame

RF2050VRP-R3H

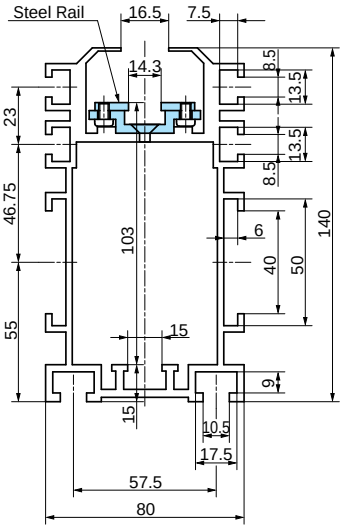
Material: Aluminum
Standard Length: 3m
Approx. Mass: 5kg/m
Stock item



Aluminum Frame with Steel Rail

RF2050VRP-R3HS

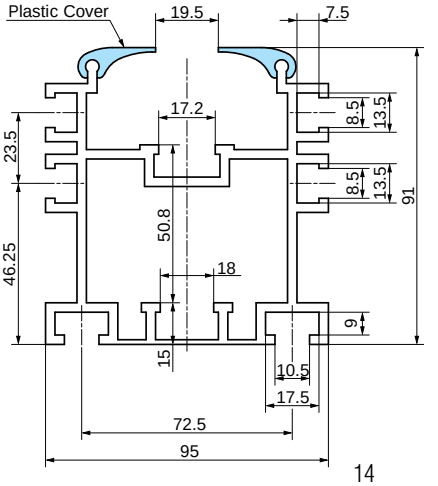
Material: Main Body = Aluminum
Steel Rail = SS400
Standard Length: 3m
Approx. Mass: 6.3kg/m
Stock item



Aluminum Frame with Plastic Cover

RF2060VRP-R4K

Material: Main Body = Aluminum
Standard Length: 4m
Approx. Mass: 4kg/m
Stock item



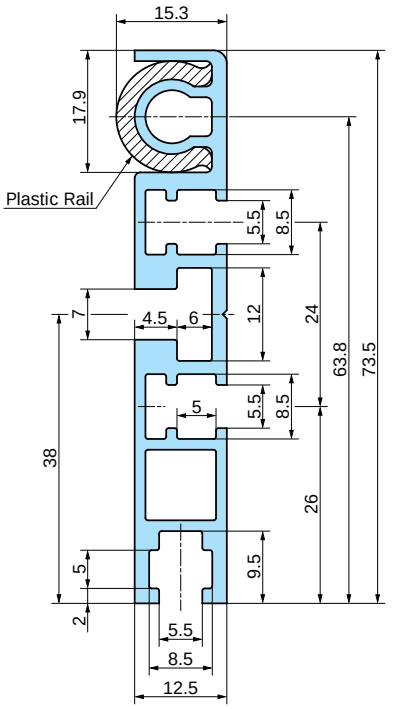
Pallet Guide Rail ··· PGR
Plastic Rail ··· Plastic Rail

Model Identification

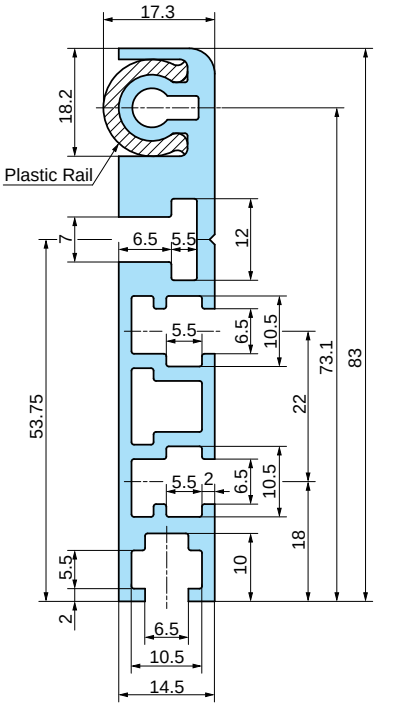
RF2040VRP-PGR-1L

- Application Chain Size
- Plate Guide Rail: PGR / Plastic Rail: Plastic Rail
- Middle Section: No symbol / Drive and Driven Section: 1L

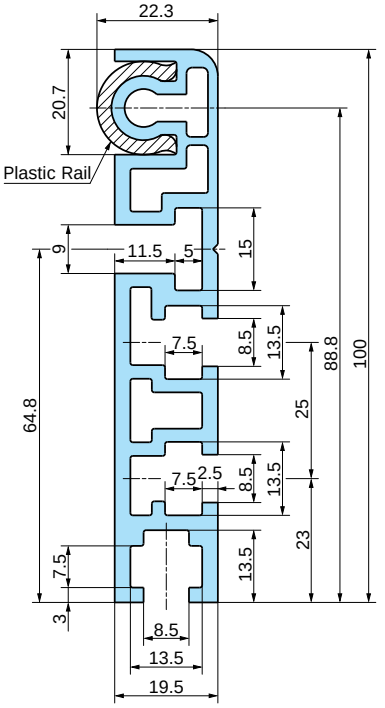
RF2030VRP



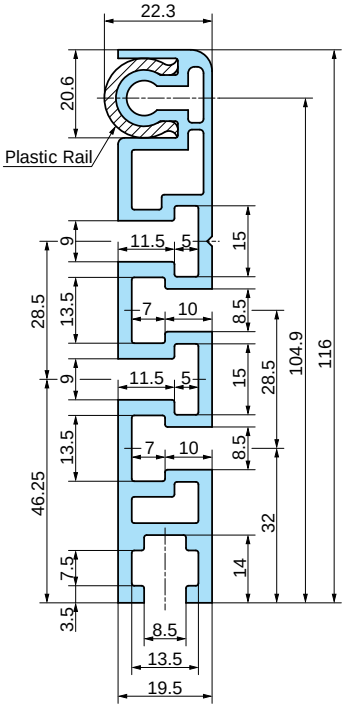
RF2040VRP



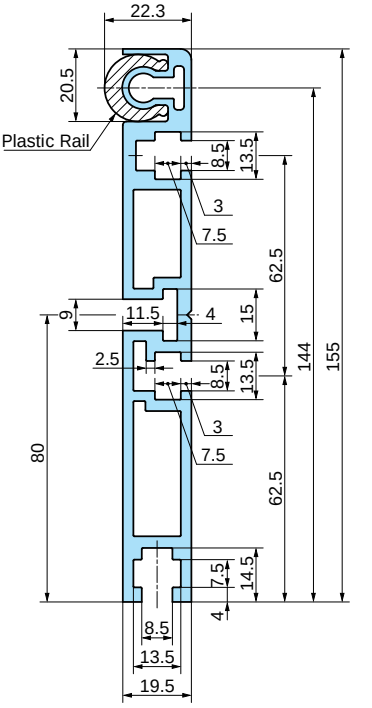
RF2050VRP



RF2060VRP



RF2080VRP



Pallet Guide Rail Model		Standard Length		Mass kg/m	Material
Middle Section	Drive and Driven Section	Middle Section	Drive and Driven Section		
RF2030VRP-PGR	RF2030VRP-PGR-IL	3m	1m	0.9	Aluminum
RF2040VRP-PGR	RF2040VRP-PGR-IL	4m	1m	1.5	
RF2050VRP-PGR	RF2050VRP-PGR-IL	4m	1m	2.2	
RF2060VRP-PGR	RF2060VRP-PGR-IL	4m	1m	2.5	
RF2080VRP-PGR	RF2080VRP-PGR-IL	3m	1m	3.5	

Stock item

Plastic Rail Model		Standard Length		Material
Middle Section	Drive and Driven Section	Middle Section	Drive and Driven Section	
RF2030VRP-Plastic Rail	RF2030VRP-Plastic Rail-IL	3m	1m	Ultra High Molecular Polyethylene
RF2040VRP-Plastic Rail	RF2040VRP-Plastic Rail-IL	4m	1m	
RF2050VRP-Plastic Rail	RF2050VRP-Plastic Rail-IL	4m	1m	
RF2060VRP-Plastic Rail	RF2060VRP-Plastic Rail-IL	4m	1m	
RF2080VRP-Plastic Rail	RF2080VRP-Plastic Rail-IL	3m	1m	

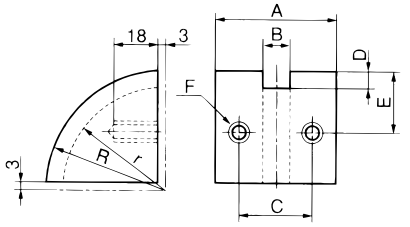
Stock item
Note: Please order Pallet Guide and Plastic Rail separately.

Return Guide

Double-Plus Chain

(Use with RF2030, RF2040 with Snap Cover)

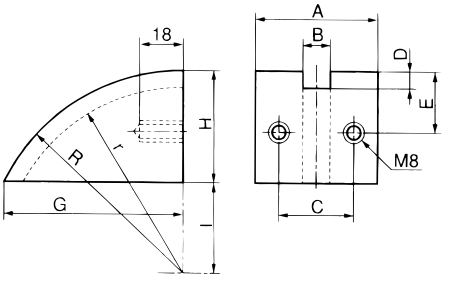
* Can also be used for Center Roller Chain



Return Guide Model	A	B	C	D	E	F	r	R	Applicable chain
RF2030VRP-RG	34	9	22	6	31	M6	54	60	Double-Plus Chain and Double-Plus Chain with Snap Cover
RF2040VRP-RG	50	12	30	8	30	M8	52	60	
RF2050VRP-RG	56	15	35	10	32	M8	50	60	Double-Plus Chain
RF2060VRP-RG	60	18	39	12.5	32	M8	47.5	60	
RF2080VRP-RG	70	23	45	15	41	M8	65	80	

Materials: Ultra High Molecular Polyethylene. Stock item

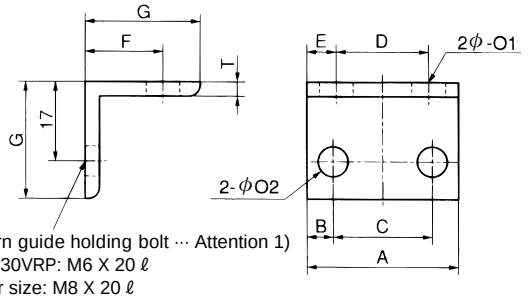
Double-Plus Chain with Snap Cover



Return Guide Model	A	B	C	D	E	G	H	I	r	R
RF2050VRP-RG-SC	56	15	35	10	32	90.3	57	43	90	100
RF2060VRP-RG-SC	60	18	39	12.5	32	90.3	57	43	87.5	100
RF2080VRP-RG-SC	70	23	45	15	41	139.6	77	88	150	165

1). RF2030, RF2040 can be used with Double-Plus Chain's RG.
2). Materials: Ultra High Molecular Polyethylene.
3). Products in non-bolded lettering are made to order.

Bracket



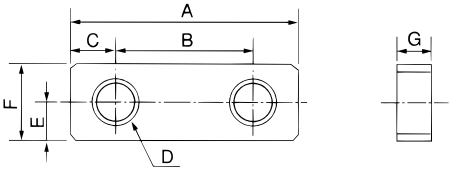
Return guide holding bolt ··· Attention 1)
RF2030VRP: M6 X 20 ℓ
Other size: M8 X 20 ℓ

Return guide model	A	B	C	D	E	F	G	T	O1	O2
RF2030VRP-GB	34	6	22	20.5	6.7	18	25	3	6.5	6.5
RF2040VRP-GB	60	15	30	44.5	7.7	20	30	3	8.5	8.5
RF2050VRP-GB	76	20.5	35	55.5	10.2	24	35	4	10.5	8.5
RF2060VRP-GB	94	27.5	39	72.5	10.7	24	35	4	10.5	8.5
RF2080VRP-GB	100	27.5	45	70.0	15	24	35	4	10.5	8.5

Attention 1) Holding bolt is not attached
Material: Aluminum. Stock item

Frame joint

NEW



Frame joint model	A	B	C	D	E	F	G
RF2030VRP-FJ	40	24	8	M6	5.0	10	5
RF2040VRP-FJ	40	24	8	M6	5.0	10	5
RF2050VRP-FJ	40	24	8	M8	6.5	13	6
RF2060VRP-FJ	40	24	8	M8	6.5	13	6
RF2080VRP-FJ	40	24	8	M8	6.5	13	6

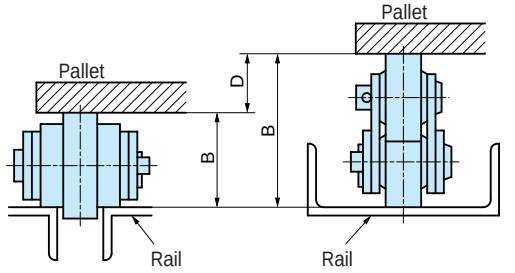
Material: Stainless steel. Stock item

Double-Plus Chain (Large size series)

1. Conveying speed = 2.3 times chain speed

2. Stable conveying

Height is less than Chain with Top Roller, and both sides of the roller touch the rail providing more stable conveying



Double-Plus Chain　　Chain with Top Roller

Chain Size	B		D
	Double-Plus Chain	Chain with Top Roller	
RF03	36.9	59	22.1
RF05	46.5	70	22.5
RF10	58.9	80.8	21.9
RF6205	66.3	95	28.7
RF12	66.3	110	43.7
RF17	75.5	145	69.5

3. Energy saving/Lower cost

As the co-efficient of friction is small, the necessary power required also decreases, thereby allowing a smaller chain size.

Co-efficient of friction　Double-Plus chain ——— 0.05
RF Conveyor chain (R roller) – 0.08

4. Long life

Chain speed is 1/2.3. As the allowable load of the conveying roller is large, chain life is more than doubled. (Compared to Chain with Top roller)

Allowable load of the conveying roller (kg/pc)

Chain Size	Double-Plus Chain	Chain with Top Roller (Heat treated spec.)
RF03	130	60
RF05	240	105
RF10	350	195
RF6205･RF12	500	255
RF17	620	420

5. Operating temperature

–20°C ~ +200°C (–4°F ~ +392°F)

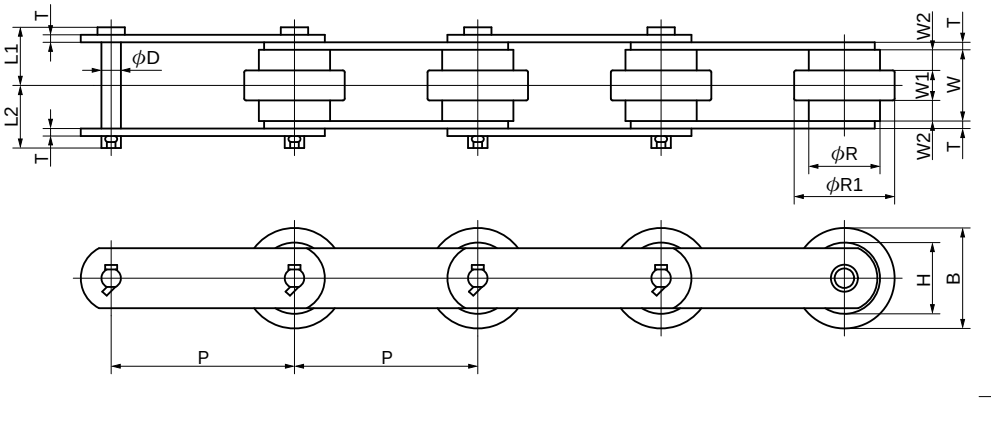
6. Chain material

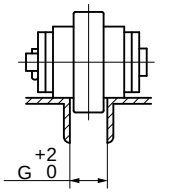
Steel

7. Sprocket

SS400 machine cut tooth sprocket.

Double-Plus Chain (Large size series) Dimensions





Rail gauge

Chain model identification

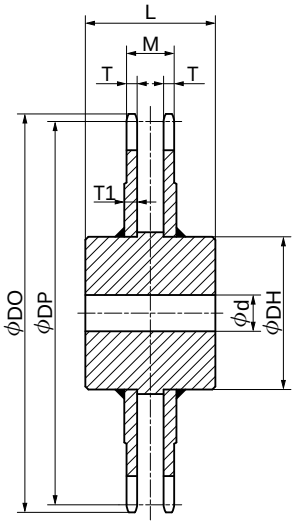
RF03075VR

- RF: Double-Plus chain
- 075: RF model chain size (Chain pitch)

Chain model	Pitch	Roller		Width			Plate		Pin			B	G	Max. Allowable Tensile Strength kN(kgf)	Allowable Roller Load kN(kgf/pc)	Approx. Mass kg/m
	P	R1	R	W1	W2	W	T	H	D	L1	L2					
RF03075VR	75	42.0	31.8	12	8.5	30	3.2	22	8.0	24.5	27	36.9	14.5	4.12(420)	1.27(130)	4.7
RF03100VR	100															4
RF05100VR	100	53.0	40.0	16	11	39	4.5	32	11.3	33.5	37	46.5	18.5	9.81(1000)	2.35(240)	8
RF05125VR	125															7
RF05150VR	150															6
RF10125VR	125	67.0	50.8	20	14	54	6.3	38.1	14.5	45	48	58.9	25	15.7(1600)	3.43(350)	14
RF10150VR	150															12
RF6205VR	152.4	75.5	57.2	22	16	62	7.9	44.5	15.9	53	55.5	66.3	28	26.5(2700)	4.90(500)	18
RF12200VR	200															15
RF17200VR	200	86.0	65.0	25	18	69	9.5	50.8	19.1	60.5	66.5	75.5	31	34.3(3500)	6.08(620)	20

Made to Order

Sprocket Dimensions



Material: SS400

Attention
(1) Sprockets of more than 10 teeth can be produced.
(2) There is no hardened tooth specification.
(3) Sprockets over 30kg have a hole in the tooth area to allow the sprocket to be hung up.

Sprocket model	Teeth No.	Outer Diameter DO	Pitch Diameter DP	Pilot Hole Diameter d	Shaft Diameter Range	Hub Diameter DH	Hub Length L	Tooth Thickness T (T1)	M	Approx. Mass kg/m
RF03075VR-6T	6	158	150.0	20	25 ~ 40	65	55	5 (6)	26	3.0
RF03075VR-8T	8	209	196.0	20	25 ~ 45	70	60	5 (6)	26	4.5
RF03100VR-6T	6	206	200.0	20	25 ~ 45	70	60	5 (6)	26	4.5
RF03100VR-8T	8	272	261.3	20	25 ~ 50	80	70	5 (6)	26	7.5
RF05100VR-6T	6	205	200.0	25	30 ~ 60	95	80	8 (9)	35.5	7.5
RF05100VR-8T	8	273	261.3	25	30 ~ 70	105	90	8 (9)	35.5	13
RF05125VR-6T	6	256	250.0	25	30 ~ 70	105	90	8 (9)	35.5	11
RF05125VR-8T	8	338	326.6	25	30 ~ 70	105	90	8 (9)	35.5	17
RF05150VR-6T	6	304	300.0	25	30 ~ 70	105	90	8 (9)	35.5	15
RF05150VR-8T	8	402	392.0	30	35 ~ 75	115	100	8 (9)	35.5	24
RF10125VR-6T	6	262	250.0	30	35 ~ 75	115	100	11 (12)	48	15
RF10125VR-8T	8	343	326.6	30	35 ~ 80	125	105	11 (12)	48	24
RF10150VR-6T	6	309	300.0	30	35 ~ 80	125	105	11 (12)	48	20
RF10150VR-8T	8	408	392.0	35	40 ~ 85	135	115	11 (12)	48	32
RF6205VR-6T	6	330	304.8	35	40 ~ 95	145	125	14 (16)	56	29
RF6205VR-8T	8	432	398.2	35	40 ~100	145	125	14 (16)	56	42
RF12200VR-6T	6	434	400.0	35	40 ~100	145	125	14 (16)	56	43
RF12200VR-8T	8	557	522.6	40	45 ~110	155	135	14 (16)	56	67
RF17200VR-6T	6	439	400.0	40	45 ~110	155	135	15 (16)	62	47
RF17200VR-8T	8	562	522.6	45	50 ~120	175	150	15 (16)	62	76

Made to Order

Selection

1. Check conveying conditions

(1) Type of products conveying, mass, dimensions and amount (including pallet)
(2) Conveyor speed
(3) Conveyor length (Accumulator section and Conveying section length)
(4) Operating environment

2. Chain type selection

Taking into consideration the operating conditions and environment, decide the chain and roller specifications. (Except for the large size series)

① **Chain**

Chain Specification	Operating Environment
Standard	General use
Lubrication-free	Do not want to or cannot lubricate
Hard Cr. plating	For clean rooms and anti-rust use
Stainless Steel	Non-magnetic properties are necessary

② **Roller**

Roller Specification	Features
A: Standard	High allowable tensile strength
UA: Direct conveying/Standard	Direct conveying is possible and high allowable tensile strength
B: High friction	Fast and Low noise
UB: Direct conveying/High friction	Direct conveying is possible, fast and low noise
C: Conductive	Anti-static and High allowable tensile strength
D: Conductive/High friction	Anti-static, fast and low noise
CR: Center Roller	When chain and conveying products are of equal speed, more stable than Top Roller
Steel	High load and heat resistant

* For UA, UB only RF2030VRP

3. Temporary Chain and Rail Selection

① Using Chart 1 (page 20), calculate the conveyed product's mass per meter of conveyor and select a temporary chain size and frame specification.

$$\omega = \frac{W}{\ell}$$

ω: Converted mass (kg/m) per meter of the conveyed product
W: Conveyed product's mass per pallet (Incl. pallet)
ℓ : Length of pallet m (Conveying direction)

Ex.) Conveyed product's mass: 35kg
Mass/Pallet: 10kg
Pallet length (Conveying direction): 0.5m

$$\omega = \frac{(35+10)}{0.5} = 90\text{kg/m}$$

For aluminum chain: RF2060VRP
For frame with steel rail: RF2040VRP ~ RF2080VRP, as a temporary selection.

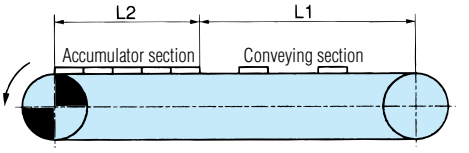
② Temporary check of chain tension
SI unit: $T=9.80665 \times W_T \times f \times K$
Current Unit: $T = W_T \times f \times K$

The SI Unit and the Current Unit are written side by side. When calculating the maximum tension T, the weight (kgf) and the mass (kg) are identical in value.

T: Actual Max. tension on chain N(kgf)
W_T: Total mass of conveyed products excluding chain
f: Coefficient of friction $f=f_2+f_3$ (Chart 2, Chart 5)
K: Chain speed coefficient (Chart 3)
T/2 ≦Max. Allowable tension (Chart 4). Select the chain size that satisfies this formula.

4. Calculation for final confirmation

Calculation for Actual Max. tension on chain (T)



SI Unit

$$T= 9.80665 \cdot [(\omega_1+m)L_1 \cdot f_1+\omega_2 \cdot L_2 \cdot f_2+(\omega_2+m) \times L_2 \cdot f_3+1.1m(L_1+L_2)f_1]$$

Required Power calculation $kW=\frac{T \cdot V}{54570\eta}$

Current Unit

$$T=(\omega_1+m)L_1 \cdot f_1+\omega_2 \cdot L_2 \cdot f_2+(\omega_2+m)\,[L_2 \cdot f_3+1.1m(L_1+L_2)f_1]$$

Required Power calculation $kW=\frac{T \cdot V}{5565\eta}$

T: Actual Max. Tension on chain (N {kgf})
L_1: Length of conveying section (m)
ω_1: Mass of conveying section's conveyed products (kg/m)
L_2: Accumulator section length (m)
ω_2: Mass of Accumulator section's conveyed products (kg/m)
f_1: Coefficient of friction of Conveying section's chain and rail
f_2: Coefficient of friction of Accumulator section's chain and conveyed products
f_3: Coefficient of friction of Accumulator section's chain and rail
m: Chain mass (kg/m)
kW: Required power (kW)
V: Chain speed (m/min)
η: Transmission efficiency of Drive section

Chain tension (T) can be obtained using the above formulae and the values for f_1, f_2 and f_3 from charts 2 and 5. However, in the case of Free Flow conveyor there are usually two strands of chain. In this case the chain mass will be that of two chains, the value for T will be the Actual Max. Tension on 2 chains.

5. Chain size selection

Multiply Actual Max. Tension on chain (T) by the Coefficient of speed (K) (Chart 3). Select the chain that satisfies the formulae below. (Refer to Chart 4).

$$\frac{T \cdot K}{2} \leqq \text{Max. Allowable Tension for 1 strand of chain}$$

Chart 1. Allowable conveying Mass

The chart below shows the Allowable conveying mass for 2 strands of chain.

Unit: kg/m

Chain size	Aluminum frame	Frame with steel rail
RF2030VRP	40 (20)	80 (20)
RF2040VRP	60	120
RF2050VRP	80	160
RF2060VRP	100	200
RF2080VRP	—	300

Figure in ( ) is the Allowable value for Urethane Rollers.

Unit: kg/m

Chain size	Frame with steel rail
RF2030VR	160
RF2040VR, RF2040CR	240
RF2050VR, RF2050CR	320
RF2060VR, RF2060CR	400

■ For large size series use the Allowable Roller Load (Page 18) for selection.

Chart 2. Coefficient of friction for Engineering Plastic Roller (Max.)

Coefficient of friction \ Roller specification	A · C · UA	B · D · UB
f1 { Coefficient of friction for Conveying part's chain rail }	0.08	0.08
f2 { Coefficient of friction for Accumulator's chain and conveyed product }	0.1	0.15
f3 { Coefficient of friction for Accumulator's chain and rail }	0.2	0.25

* For selection use the maximum value is applied.

Chart 3. Coefficient of speed

Chain speed (m/min)	Coefficient of speed (K)
Less than 15	1.0
15 ~ 30	1.2

Chart 4. Max. Allowable tension of Chain

Unit: kg/m

Size \ Chain Specification \ Roller Specification	A · C (UA)	B · D (UB)
RF2030VRP Standard	550 (56)	275 (28)
RF2030VRP Hard Cr. Plating		
RF2030VRP Lubrication-free		
RF2030VRP Stainless steel	275 (28)	
RF2040VRP Standard	880 (90)	440 (45)
RF2040VRP Hard Cr. Plating		
RF2040VRP Lubrication-free		
RF2040VRP Stainless steel	440 (45)	
RF2050VRP Standard	1,370 (140)	685 (70)
RF2050VRP Hard Cr. Plating		
RF2050VRP Lubrication-free		
RF2050VRP Stainless steel	685 (70)	
RF2060VRP Standard	2,060 (210)	1,030 (105)
RF2060VRP Hard Cr. Plating		
RF2060VRP Lubrication-free		
RF2060VRP Stainless steel	1,030 (105)	
RF2080VRP Standard	5,300 (540)	2,650 (270)
RF2080VRP Hard Cr. Plating		
RF2080VRP Lubrication-free		
RF2080VRP Stainless steel	2,650 (270)	

Size \ Chain Specification \ Roller Specification	Steel (Double-plus Chain)	Center Roller (Single-plus chain)
RF2030VR Standard	980 (100)	—
RF2040VR-CR Standard	1,570 (160)	1,570 (160)
RF2050VR-CR Standard	2,450 (250)	2,450 (250)
RF2060VR-CR Standard	3,730 (380)	3,730 (380)

* For large size series please refer to Page 18.

Chart 5. Coefficient of friction for Large Size Series Steel Roller

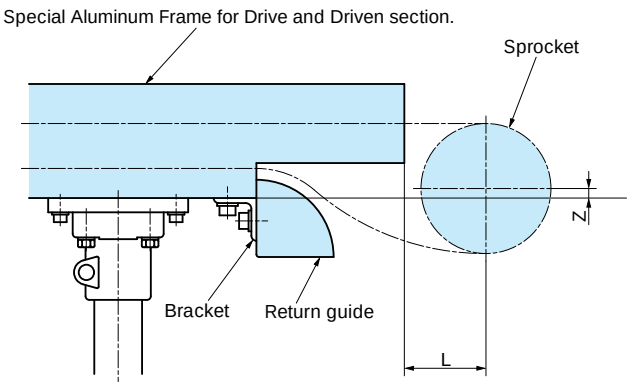
Coefficient of friction	Steel Roller		Large Size Series		Center Roller	
	Non-lubricated	Lubricated	Non-lubricated	Lubricated	Non-lubricated	Lubricated
f1 { Coefficient of friction for Conveying part's chain and rail }	(0.05)	0.05	(0.05)	0.05	(0.12)	0.08
f2 { Coefficient of friction for Accumulator's chain and conveyed product }	(0.15)	0.1	(0.15)	0.1	(0.09)	0.06
f3 { Coefficient of friction for Accumulator's chain and rail }	(0.25)	0.1	(0.15)	0.1	(0.12)	0.08

Attention: The coefficient of friction figure for Non-lubricated is a reference value. Lubrication is recommended for the Steel Roller and Large size series.

Conveyor design materials

Please use the specifications below as a reference to set up and operate the conveyor.

1. Conveyor ends and correct sprocket position

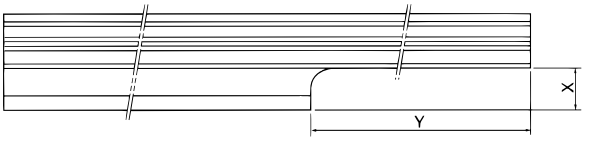


Chain No.	RF2030VRP	RF2040VRP	RF2050VRP
Rail No.	RF2030VRP-R3L RF2030VRP-R3LS	RF2040VRP-R4L RF2040VRP-R4LS	RF2050VRP-R4L RF2050VRP-R4LS
Z	21.3	14.7	16.1
L	40	50	60

Chain No.	RF2050VRP	RF2060VRP	RF2080VRP
Rail No.	RF2050VRP-R3H RF2050VRP-R3HS	RF2060VRP-R4K RF2060VRP-R4L RF2060VRP-R4LS	RF2080VRP-R3LS
Z	76.2	14.9	24
L	60	70	100

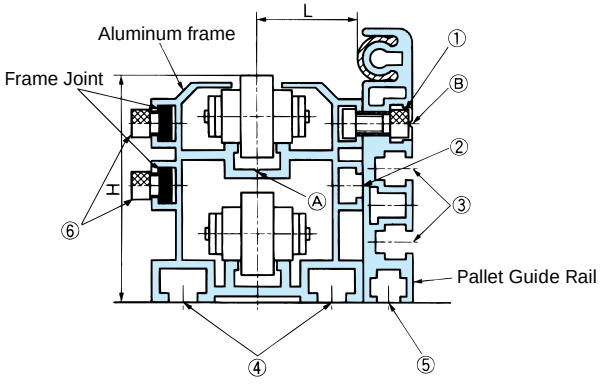
2. Aluminum frame operation dimensions

The rail shown below has no Aluminum frame for the Drive or Driven parts.
Use the following dimensions as a reference and additionally process a Middle Section frame.



Chain No.	RF2050VRP	RF2060VRP
Rail No.	RF2050VRP-R3H RF2050VRP-R3HS	RF2060VRP-R4K
X (Drive side)	340	430
X (Driven)	120	130
Y	30	40

3. Fastening bolt and conveyor height



Item / Frame	①	②	③	④	⑤	⑥	H	L
RF2030VRP-R3L RF2030VRP-R3LS	M6 x 10ℓ	M6	M5	M6	M5	M6 x 8ℓ	61.5	14.5
RF2040VRP-R4L RF2040VRP-R4LS	M6 x 12ℓ	M6	M6	M8	M6	M6 x 8ℓ	68	28.5
RF2050VRP-R4L RF2050VRP-R4LS	M8 x 20ℓ	M8	M8	M10	M8	M8 x 10ℓ	82.5	36
RF2050VRP-R3H RF2050VRP-R3HS	M8 x 20ℓ	M8	M8	M10	M8	M8 x 10ℓ	142.5	37
RF2060VRP-R4K RF2060VRP-R4L RF2060VRP-R4LS	M8 x 20ℓ	M8	M8	M10	M8	M8 x 10ℓ	95	44.5
RF2080VRP-R3LS	M8 x 25ℓ	M8	M8	M10	M8	M8 x 12ℓ	130	47

(1) Positioning between Aluminum frames

Referring to the above diagram, using the V-notch, Ⓐ, as a guide, position the frame. Using bolts fix the frame at ④.

(2) Aluminum frame connection

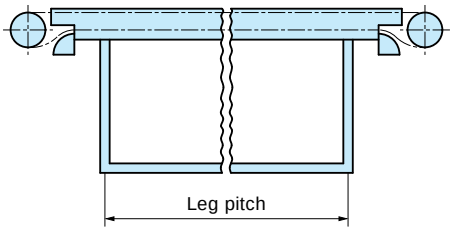
After positioning, connect the frames using the frame joint; this is firmly reinforced.
* The frame joint is not to be used for positioning between the frames.

(3) Attachment of Pallet Guide Rail

Referring to the above diagram, at the V-notch, Ⓑ, make the required size hole and using a hexagonal bolt attach the Pallet Guide Rail.

4. Conveyor Leg Pitch

Decide the pitch based on the mass of the conveyed product and the geometrical moment of inertia, as shown in the right hand chart



Type	Frame size No.	Geometrical moment of inertia (I) (cm^4)
Aluminum frame	RF2030VRP-R3L	17.127
	RF2040VRP-R4L	40.185
	RF2050VRP-R4L	84.039
	RF2050VRP-R3H	408.283
	RF2060VRP-R4L	135.137
	RF2060VRP-R4K	108.508
Aluminum frame with Steel Rail	RF2030VRP-R3LS	17.821
	RF2040VRP-R4LS	44.312
	RF2050VRP-R4LS	95.623
	RF2050VRP-R3HS	442.093
	RF2060VRP-R4LS	171.761
	RF2080VRP-R3LS	360.726

* The geometrical moment of inertia (I) of the frame for the Drive and Driven parts is as above.

Leg pitch (ℓ) calculation method

$$\ell = \left\{ \frac{384EI}{5 \times (0.6W)} \times \delta \times 10^7 \right\}^{\frac{1}{4}} (mm)$$

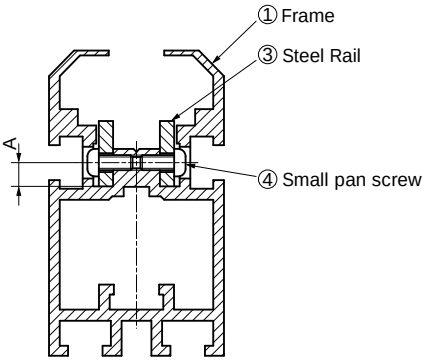
I= Geometrical moment of inertia (cm^4)
(Refer to chart on the right)
W= Load mass (kg/m)
δ = Bend (2mm)
E=7.0 x 10^3 (kg/mm^2)

Attention: (W) For use with two strands of chain, consider load unbalance and use a load mass of (0.6W)

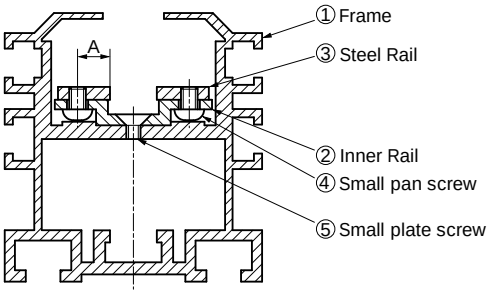
5. Aluminum frame with Steel Rail

(1) Cross section structure

RF2030VRP

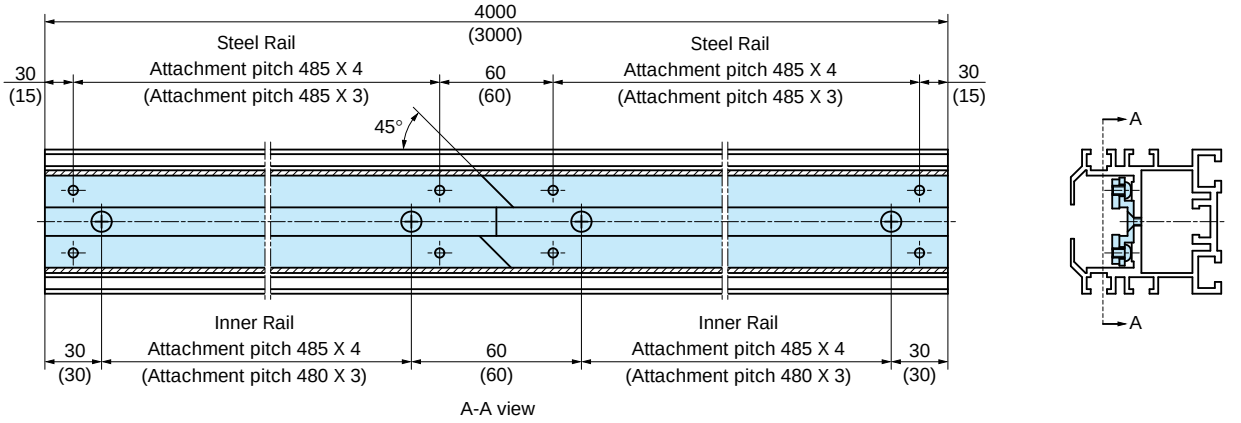


RF2040VRP ~ RF2080VRP



Frame Model		Steel Rail (③)		Steel Rail screw (④) Phillips head Small pan screw	Inner Rail screw (⑤) Phillips head Small plate screw
Middle section	Drive and Driven section	Dimensions (Plate Thickness x Width)	A Dimension		
RF2030VRP-R3LS	RF2030VRP-R1LSK, -R1LSJ	3 x 13	4.75	M3 x 7 ℓ	—
RF2040VRP-R4LS	RF2040VRP-R4LSK, -R1LSJ	3 x 13	8.4	M4 x 5 ℓ	M4 x 6 ℓ
RF2050VRP-R4LS	RF2050VRP-R4LSK, -R1LSJ	3 x 13	8.4	M4 x 6 ℓ	M4 x 6 ℓ
RF2050VRP-R3HS	—	3 x 13	8.4	M4 x 6 ℓ	M4 x 6 ℓ
RF2060VRP-R4LS	RF2060VRP-R4LSK, -R1LSJ	3 x 13	8.4	M4 x 6 ℓ	M4 x 6 ℓ
RF2080VRP-R3LS	RF2080VRP-R3LSK, -R1LSJ	6 x 16	10.5	M5 x 8 ℓ	M6 x 10 ℓ

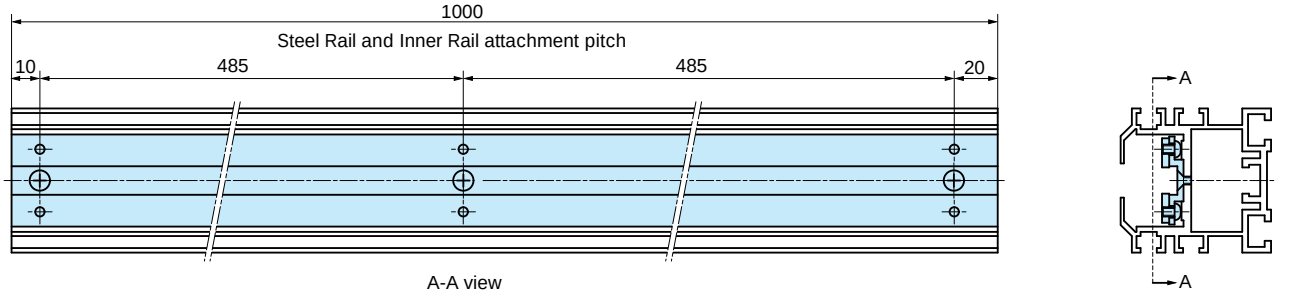
(2) Middle section frame construction diagram



A-A view

- RF2040VRP-R4LS, RF2050VRP-R4LS, RF2060VRP-R4LS ··· Overall length 4000
- RF2030VRP-R3LS, RF2050VRP-R3HS, RF2080VRP-R3LS ··· Dimensions in ( ) are for overall length of 3000
- The Steel Rail has a 45° cut in the center of the rail.

(3) Drive and Driven section frame construction diagram



A-A view

- There are no Drive section or Driven section frames for RF2050VRP-R3HS
- The lower right hand side section of the above diagram has been notched. (Refer to page 14)

(4) Handling points of Aluminum Frame with Steel Rail

- When cutting the Aluminum Frame with Steel Rail
  (1) Do not cut the middle section or the screw section of the frame.
  (2) File down any abrasive areas on the cut surface
  (3) Between 15 ~ 30 mm from the cut surface, the Steel Rail and the Inner Rail, as well as the Inner rail and the Frame should be anchored with a screw.
  (4) All parts are to be additionally processed individually. Parts should be checked for abrasive surfaces and aluminum filings and if necessary filed down or removed, then reassembled. Make sure that there is no mis-fitting of parts cut to a 45°.
- Connecting the frame
  After connecting the frame, any connecting areas of the Steel Rail that do not fit correctly, vertically or horizontally, should be chamfered to fit correctly and prevent interference with the chain's roller.

Handling Points

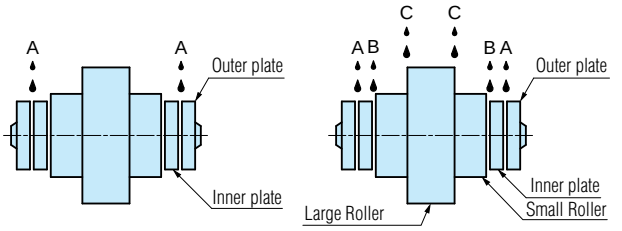
1. Similarities of Double-Plus Chain and Double-Plus Chain with Snap Cover.

(1) Recommended conveyor line length of 15m or less

(2) Do not use Engineering Plastic Rollers in conditions where they may come into contact with oil or water. (The Double-Plus function may lessen.)

(3) Avoid applications where pallets or conveyed products may fall onto the chain and where shocks or pressure on the chain may occur.

(4) After long time use, if noises from the sprocket occur, apply a small amount of oil, SAE 10 ~ 20, between the outer and inner plates onto the pin. (See diagram A below). (For the large size series use SAE 30 ~ 40). Remove any oil from the plastic rollers.

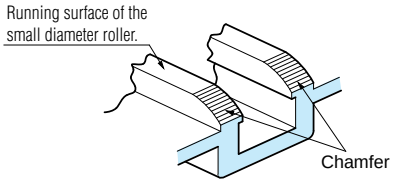


Plastic roller lubrication **Steel Roller lubrication**

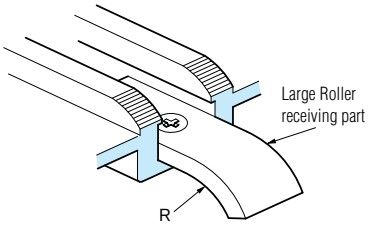
* As Lubrication-free specification Λ reduces the occurrence of noise between Pin and Bushing it is recommended for conditions adverse to lubricant usage.

(5) The Steel roller requires lubrication. In the above diagram, please lubricate areas A, B, C with SAE10 ~ 20. Use a needle pipe nozzle to apply the lubricant. Please remove any lubricant from the outer surfaces of the large and small rollers.

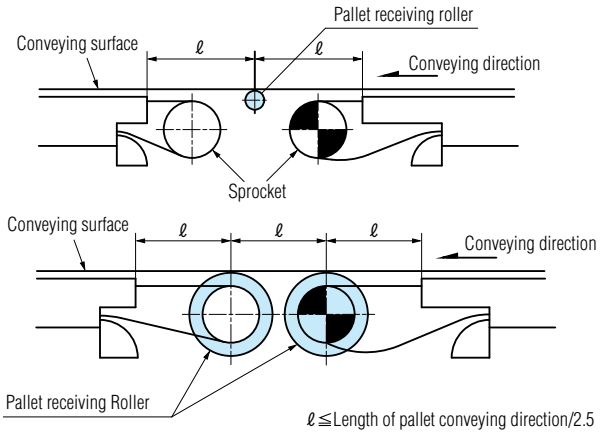
(6) Processing the upper surface of the ends of the conveying side frame
Please chamfer the running surface of the small roller.



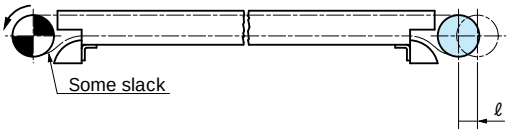
(7) Large roller receiving part
Fitting the large roller receiving part to the end of the driven section will prevent drop off of the chain (Large Roller) at the chamfered area.



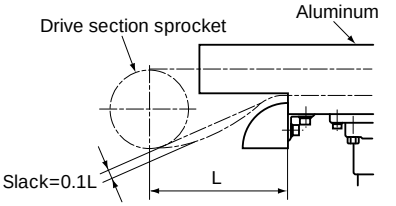
(8) Handling of area between conveyors (Straight line transfer)
At the conveyor transfer part, so as to provide stable conveying for the pallet, please fit a Free roller or a Motor roller for the pallet receiving roller.



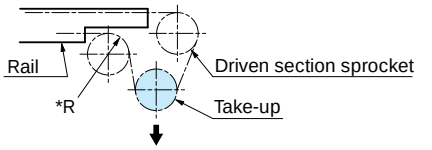
(9) Take-up (1)



Please allow for some chain slack under the drive section sprocket (Slack is 10% of the span). Take up amount: ℓ = Chain pitch x 2 + Actual length with clearance.
If the amount of slack increases either adjust the take-up or cut the chain.



(10) Take-up (2)
If take-up cannot be performed at each end of the conveyor as in the above diagram, please refer to the diagram below. However, for Double Plus Chain with Snap Cover, the dimension *R, must be larger than the R dimension for the return guide rail (Refer to dimension diagram).



(11) Sprocket and Shaft
Drive sprockets should be keyed, with both left and right sprockets aligned.
Take-up sprockets should be keyless (Free), with separate shafts on the left and right sprockets.
Other sprockets should not be keyed.

⚠ If products are to be directly placed on the chain, care should be taken to avoid scratching by the Large Diameter roller.

* RF2030VRP-UA, UB (Urethane Roller) specifications protect against the above type scratching.

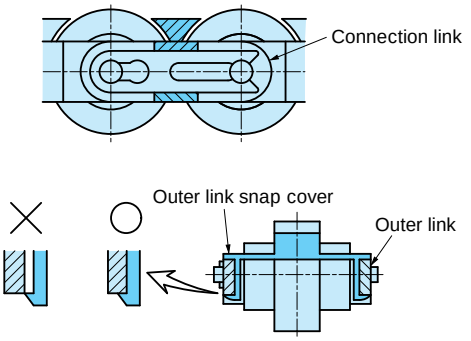
2. Double-Plus Chain with Snap cover.

(1) As the snap cover is made of Engineering Plastic, please handle it with care.

(2) As there are snap covers for outer link and Inner link use, ensure that the appropriate one is attached. (Refer to below diagram)
(Chain is shipped with snap cover attached)

Outer link snap cover **Inner link snap cover**

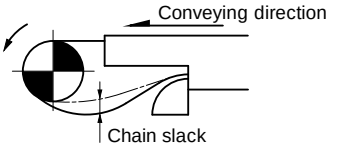
(3) After attaching the special connection link, correctly attach the outer link snap cover at the cut section of the plate. (Refer to below diagram)



(4) If the snap cover is broken during attachment please replace with a new snap cover.

(5) Please ensure a sprocket specified for Double Plus Chain with Snap Cover is used.

(6) The sprocket for use with a snap cover has a smaller outer diameter than the sprocket for use with no snap cover. Therefore, if the slack becomes larger it will be easier for the chain to come off the sprocket. Please ensure that take-up is adjusted so as not to surpass maximum slack.



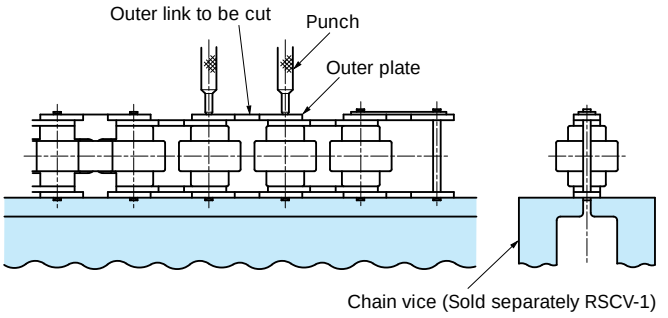
Chain slack

Chain size	Standard slack (mm)	Maximum slack (mm)
RF2030	25	75
RF2040	35	105
RF2050	40	120
RF2060	50	150
RF2080	65	190

Based on previously described conveyor design data.

Double Plus chain cutting and connecting methods

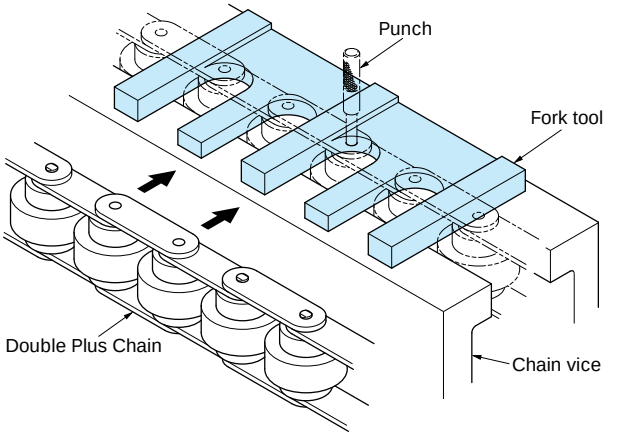
1. Cutting method



(1) Using a hand grinder, remove the riveted edge of the pin on the outer link to be cut.

(2) Put the Double Plus Chain in the chain vice (or similar device) and using a punch strike the pin until the outer plate can be removed. (For Double Plus with Snap Cover, remove the snap covers of three links around the link to be cut.)

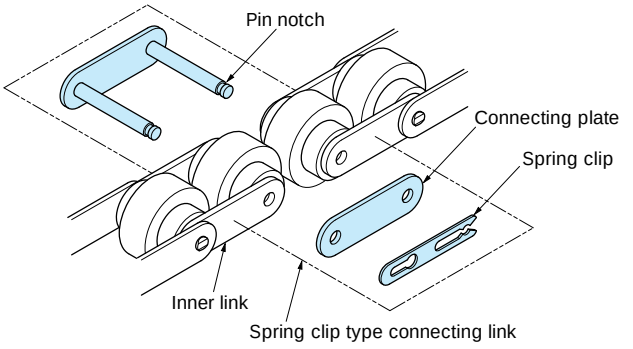
(3) Using the fork tool and the chain vice, cutting can also be performed.



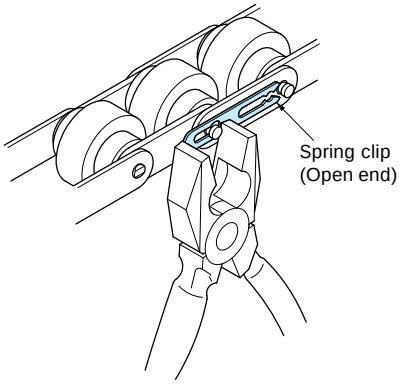
2. Connecting method (Using the connecting link)

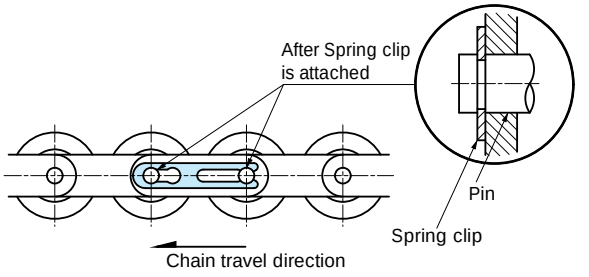
(1) Connecting using a spring clip (Sizes of RF2060 and under)

(1) After inserting the two (2) pins of the connecting link in the inner link's bushing, insert them in the connecting plate's holes.



(2) Correctly attach the Spring clip to the pin notches

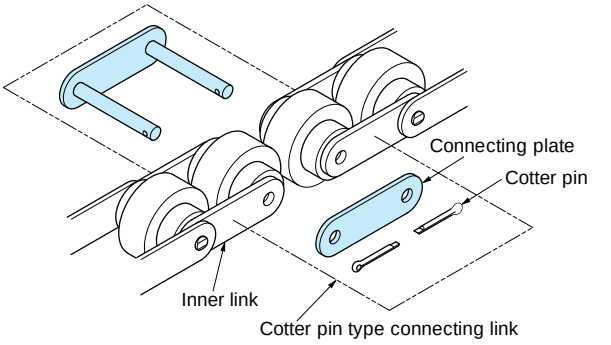


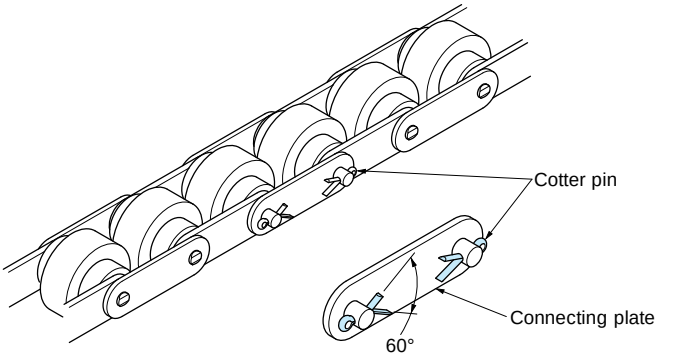


(2) Connecting using a cotter pin (Sizes of RF2080 and over)

(1) After inserting the two (2) pins of the connecting link in the inner link's bushing, insert them in the connecting plate's holes.

(2) Insert the cotter pin into the pin's hole and open the cotter pin 60°.





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