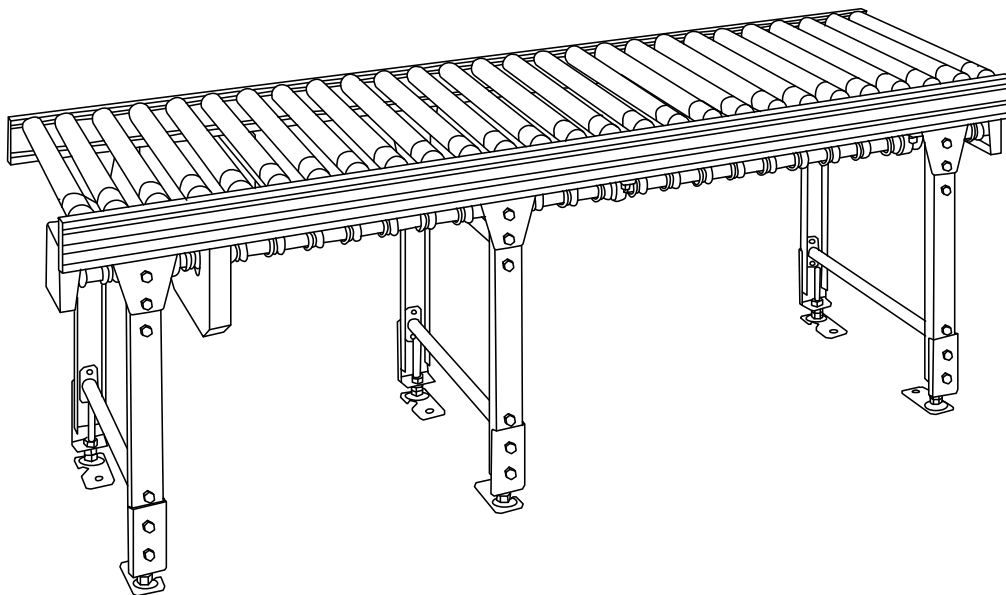


Round-belt Driving
Roller Conveyor **RINGLER®**

RAD

OPERATING AND SERVICE MANUAL



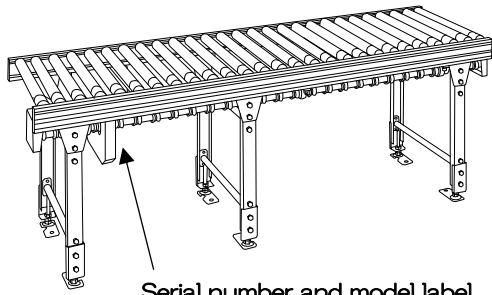
Thank you very much for purchasing our **Round-belt Driving Roller Conveyor RINGLER®**. To use the machine properly, please read this operating and service manual carefully before use. Keep the manual where the machine is installed, so that it may be referred to when needed.



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Upon delivery of this product, please check the package contents to ensure the product matches your order. If the delivered items do not match your order, please contact our local agent directly before use.



Serial number and model label
(affixed to drive cover)

Attachments (Spare parts)
Magic ring.....2 pieces

Manufacturer' s serial number
(refer to this number when contacting us)

[Example]

Date of production 20□□.□□
JOB No. □□-□□□□□-□□□□-□□
RAD-501030 (C07-3A15) 1/6 , M=□□ P=□□

Reduction gear ratio

Number of drive sprocket teeth

RAD - 50 10 30 (C 07 - 3 A15)

Conveyor model code

Nominal roller width in cm
(eg 50cm)

Roller pitch in cm
(eg 10cm)

Machine length in dm
(eg 30dm=3.0m)

Motor type
(eg Constant speed)

Motor type	Code
Constant speed	C
Inverter variable speed	F

Nominal speed in m/min
(eg 50Hz 15m/min)
NOTE: For variable-speed type, maximum speed is shown.

Frequency	Code
50Hz	A
60Hz	B

Power source type
(eg 200V three-phase)

Power source type	Code
200V three-phase	3
other	0

Motor output
(eg 0.75kW)

Motor output	Code
0.4kW	04
0.75kW	07
1.5kW	15

A. Prior To Use

**CAUTION** : Improper handling of the conveyor may result in physical injury or damage!**■Transport and assembly**

When transporting and assembling the conveyor, pay special attention not to drop it in order to avoid physical injury or damage. When lifting by crane, pay attention to the balance of the conveyor.

**■Earth and leakage breaker**

Ensure the conveyor is connected to earth at all times to prevent electric shock. Also ensure that an earth leakage breaker is connected to the power supply.

**■Emergency stop**

Install an emergency stop device to immediately stop the conveyor in emergency.

**■Start alarm**

If it is not possible to supervise the operation of the full length of the conveyor from the operating position, install a start alarm for increased safety.

**■Keep the conveyor dry at all times**

Do NOT use the conveyor in wet or humid areas. Do NOT splash liquids onto the conveyor. Do NOT use or leave the conveyor outdoors. The machine is not waterproof. Do NOT touch electrical parts with wet hands.

**■Do NOT use in an explosive atmosphere**

(Avoid explosive gas, explosive dust, etc.)

 When using in a high or inclined position:**■Lower cover and guard**

Install the optional lower cover or guard in order to prevent entry under the conveyor.

■Guide rail, top and side covers

To prevent objects from falling off the conveyor, install the optional guide rail, top and/or side covers.

**■Braking system**

When using the conveyor on an incline, it is recommended that an optional braking system be installed, in order to prevent reverse or other incorrect running of the conveyor.










■Environmental conditions

Ambient temperature	: 0°C to +40°C
Ambient humidity	: RH 90% max (Avoid condensation)
Atmosphere	: Indoor (Avoid corrosive gases, dust, etc.)
Elevation	: 1,000m or less



NOTE :

- Using the conveyor in a strong electric field (eg near broadcasting devices or high- frequency welding machinery/equipment) could cause the conveyor to malfunction. In this case, install the conveyor at a sufficient distance. Alternatively shield completely to avoid any interference with the conveyor.
- Using an inverter to this machine could cause other machines to get effects of high-frequency. In this case, install the conveyor at a sufficient distance or shield completely.

B. During Operation

	WARNING : Improper handling of the conveyor could result in serious physical injury or damage!
	■ Do NOT touch the conveyor when it is running There is considerable risk of being caught and injured by the conveyor.
 	■ Do NOT ride on or climb on the conveyor / Do NOT go under the conveyor There is considerable risk of falling or being caught and injured by the conveyor.
	CAUTION : Improper handling of the conveyor may result in physical injury or damage!
	■ Beware of entanglement When working close to the conveyor, take care not to get caught in the conveyor. There is considerable risk of being injured by the conveyor.
	■ Do NOT remove safety covers There is a risk of getting caught in the rotating parts such as pulleys. Only remove in case of maintenance or inspection.
	■ Do NOT start the conveyor while it is loaded The motor may become damaged due to overload. Additionally, the motors of variable-speed type machines may burn out as a result of running at excessively low speeds for long periods. Use the conveyor within the specifications, indicated in the instructions for use, and in the catalogue.
	■ Do NOT apply force to ends of conveyor Do NOT press down on, or hang off the sides of the conveyor. Injury may result from a toppling conveyor.
	■ Secure the conveyor to the floor/ground When using the conveyor, be sure to secure it to the floor/ground with anchor bolts etc. to prevent it from toppling irrespective of indoor use or outdoor use.

C. After Use






	CAUTION : Improper handling of the conveyor may result in physical injury or damage!
	■ Switch off the power after use Ensure that the power is switched off when carrying out relocation, inspection, cleaning, etc. of the conveyor, otherwise there is a risk that the conveyor could start unexpectedly. When leaving the conveyor unused for a long period, take plug out of the outlet /connector to prevent electric shock or leakage.

- NOTE : 1. Always use in accordance with the Occupational Safety and Health Act.
2. If the owner modifies the conveyor, any ill effects will fall outside the conditions of the guarantee.

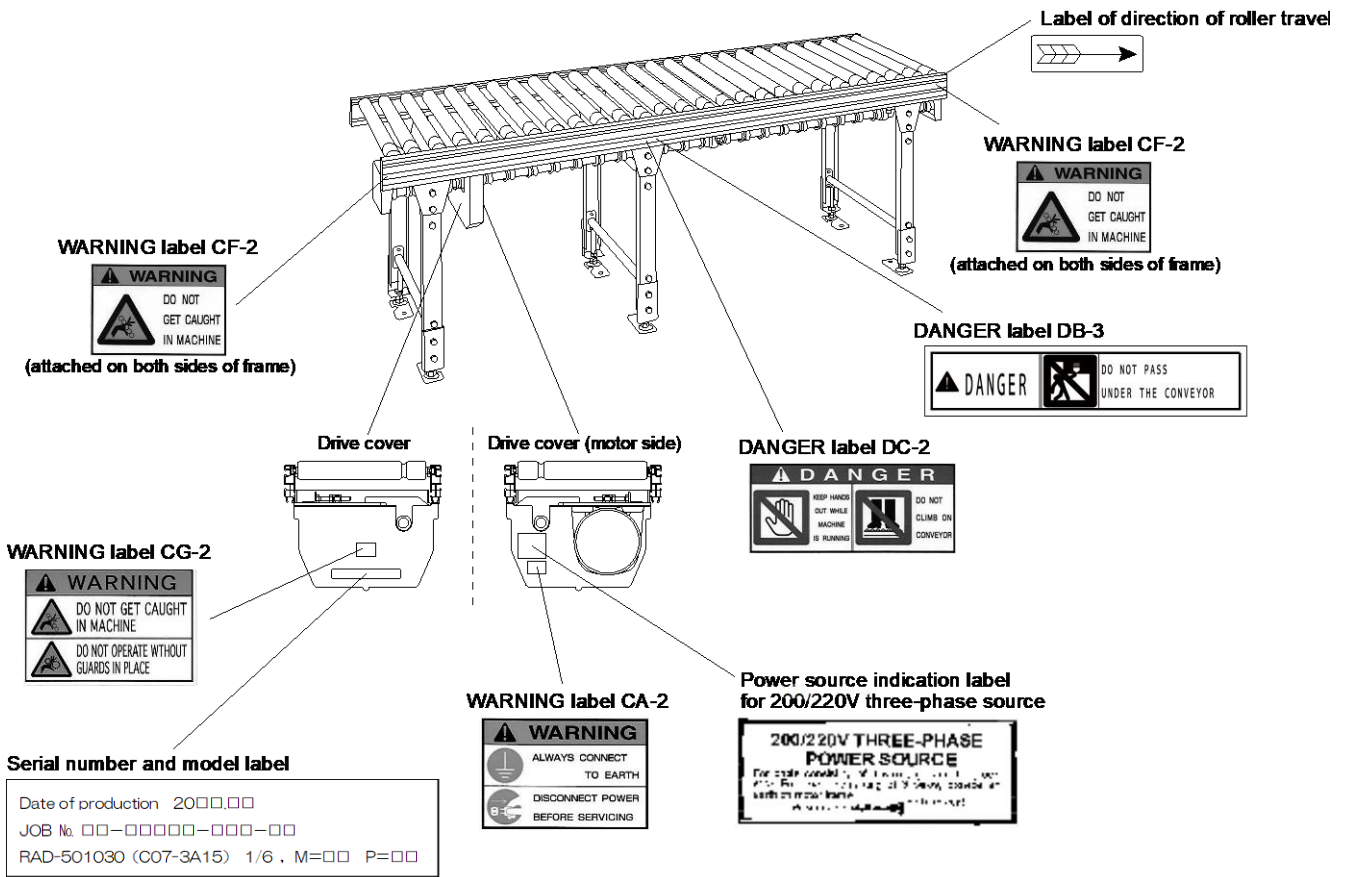
■ WARNING LABELS etc. AND ATTACHMENT POSITIONS

For standard machines, warning labels etc. and their attachment positions are as follows:

1. WARNING LABELS

Label classification	Label	Instruction
DANGER	DB-3 	<ul style="list-style-type: none"> ■ DO NOT PASS UNDER THE CONVEYOR There is considerable risk of falling or being caught and injured by the conveyor.
	DC-2 	<ul style="list-style-type: none"> ■ KEEP HANDS OUT WHILE MACHINE IS RUNNING There is considerable risk of being caught and injured by the conveyor. ■ DO NOT CLIMB ON CONVEYOR There is considerable risk of falling or being caught and injured by the conveyor.
WARNING	CA-2 	<ul style="list-style-type: none"> ■ ALWAYS CONNECT TO EARTH Ensure the conveyor is connected to earth at all times to prevent electric shock. ■ DISCONNECT POWER BEFORE SERVICING Ensure that the power is switched off when carrying out relocation, inspection, cleaning, etc. of the conveyor, otherwise there is a risk that conveyor may start unexpectedly.
	CF-2 	<ul style="list-style-type: none"> ■ DO NOT GET CAUGHT IN MACHINE When working close to the conveyor, take care not to get caught in it. There is a risk of being injured by the conveyor.
	CG-2 	<ul style="list-style-type: none"> ■ DO NOT GET CAUGHT IN MACHINE When working close to the conveyor, take care not to get caught in it. There is a risk of being injured by the conveyor. ■ DO NOT OPERATE WITHOUT GUARDS IN PLACE Do NOT remove safety covers etc. There is a risk of getting caught in the rotating parts such as pulleys. Only remove in case of maintenance, inspection, etc. unexpectedly.

2. ATTACHMENT POSITIONS OF WARNING LABELS etc.



2

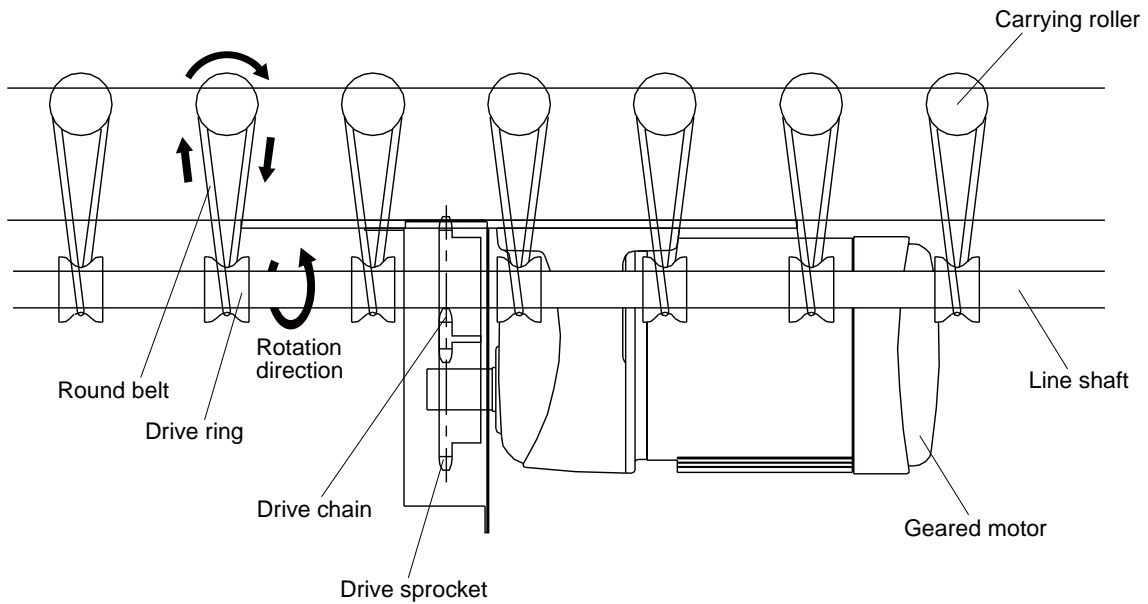
STRUCTURE

RINGLER is driven by the round belts transmitting the driving power between the carrying rollers and the line shaft.

-Accumulation can be performed by the drive rings with slipping function.

-By removing some of the round belts, it is possible to reduce the line pressure or to stop conveying.

Side view of drive unit

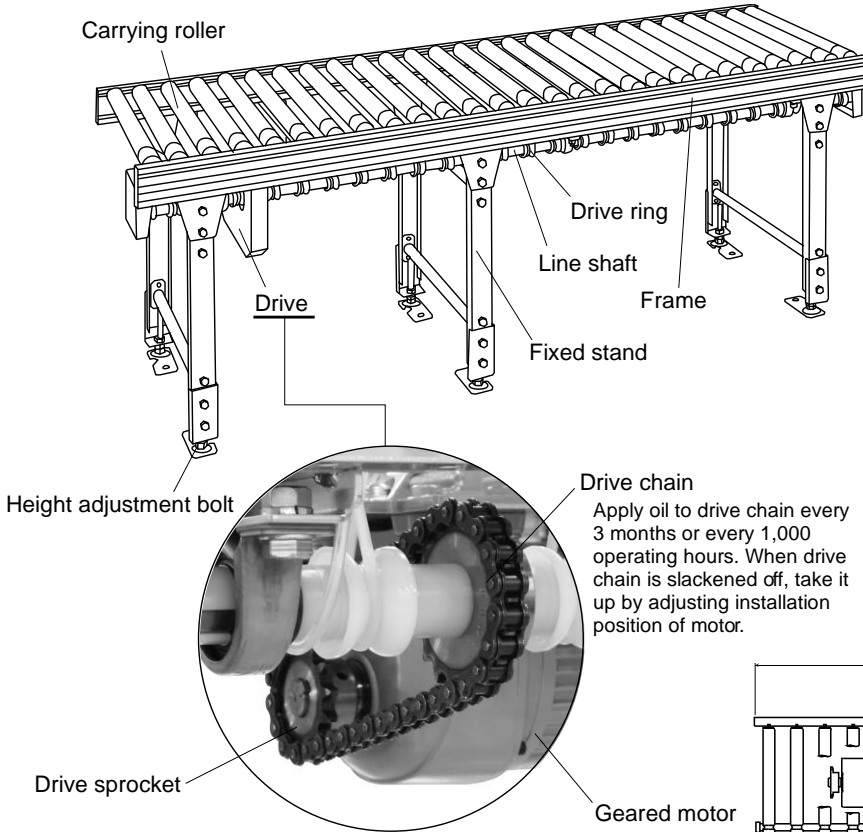


3

COMPONENT NAMES

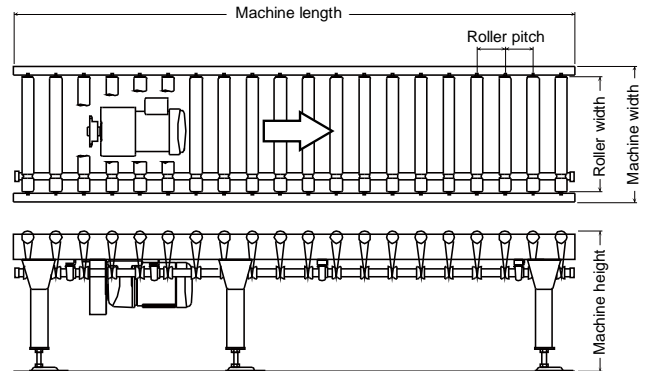
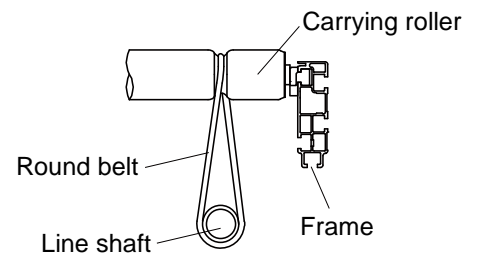
■ DRIVE UNIT

RAD model: Drive-mounted basic unit



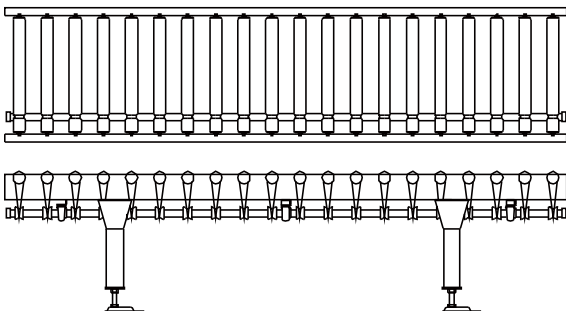
Inside of drive (without cover)

Round belt driving section



■ STRAIGHT UNIT

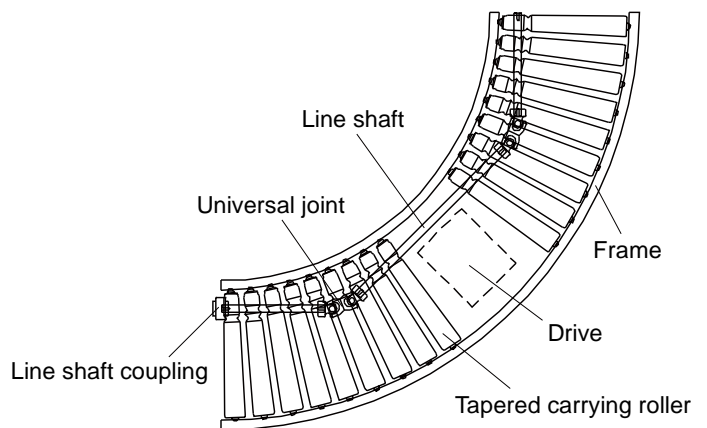
RAS model: Straight unit used interlocked with RAD model, having no drive



■ CURVE UNIT

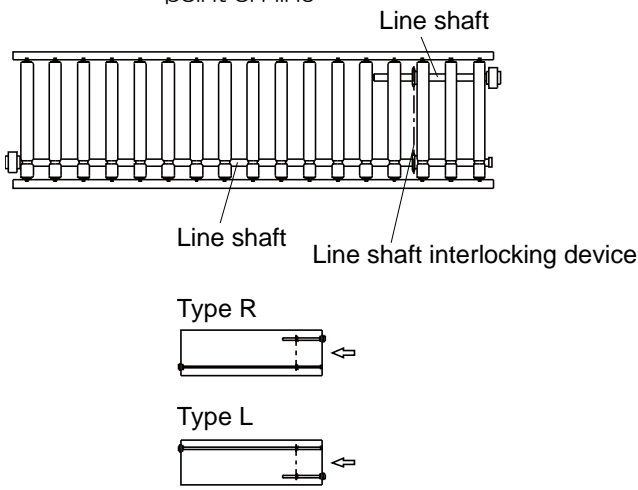
RAC model: Curve unit used interlocked with drive-mounted models, having no drive

RACD model: Drive-mounted curve unit



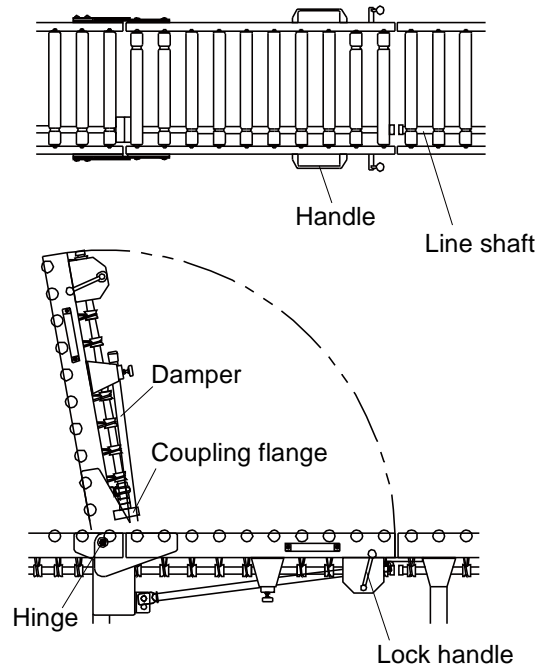
■ CHANGING UNIT

RAE model: Used to partly increase speed or to change line-shaft arrangement at splitting/merging point on line



■ RAISING UNIT

RAU mode: Used to partly raise conveyor to make a passage etc.

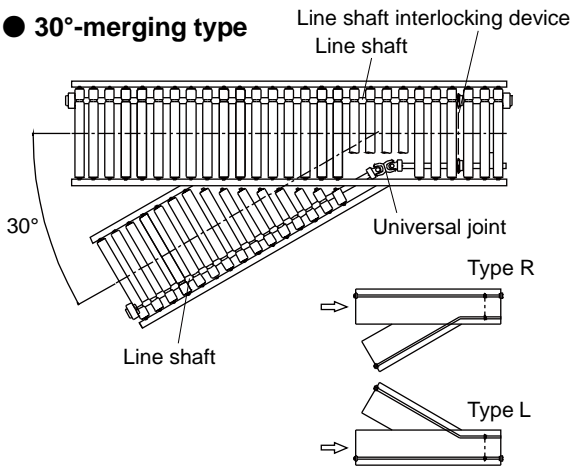


Side view

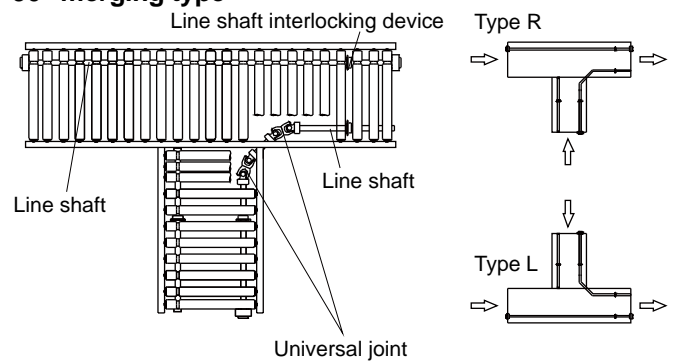
■ MERGING UNIT

RAJ model: Merging at 30° or 90°

● 30°-merging type

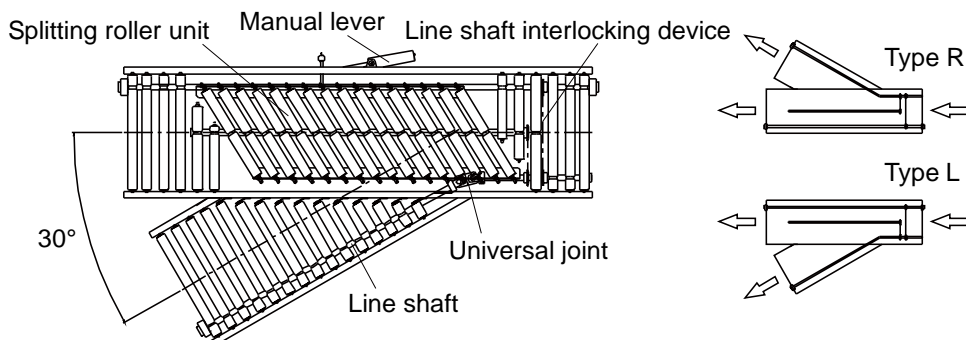


● 90°-merging type



■ SPLITTING UNIT

RAB model: Switching direction of roller travel by 30° , air-switching type or manual switching type



4

ASSEMBLY

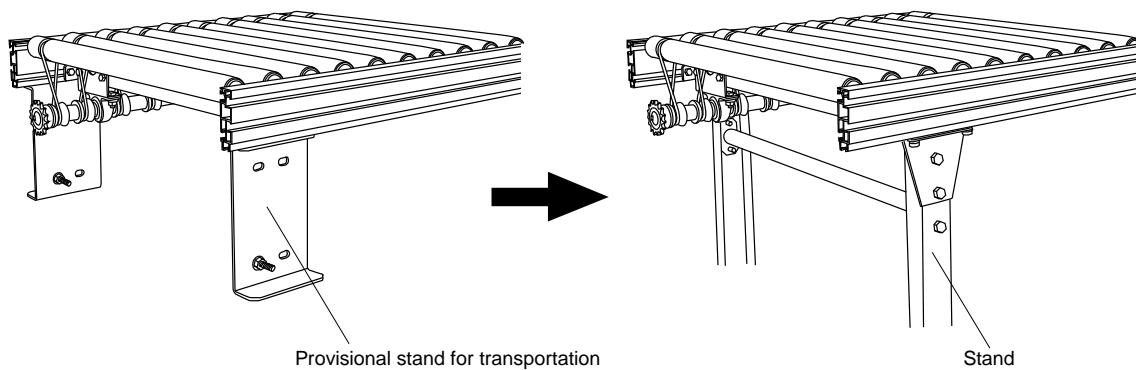


CAUTION

When removing provisional stands or installing stands, be sure to support the conveyor main body by plural people or crane etc. to prevent it from falling or toppling, otherwise there is a risk of serious injury or accident.

INSTALLING STANDS (Stands are optional and delivered in separate packaging.)

1. Remove provisional stands for transportation. (See figure below.)
2. Referring to the tables below, install stands in intended positions.



■ Table of installation dimension

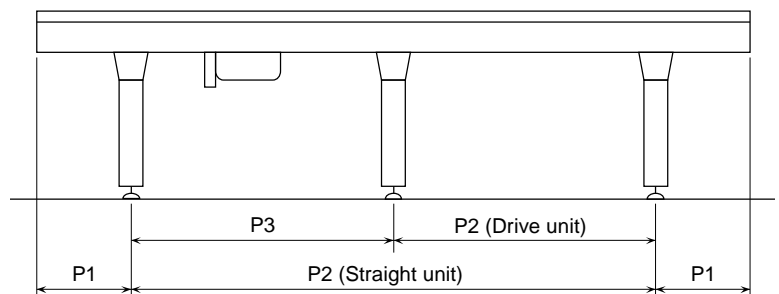
unit: mm

Machine model code	Drive unit (RAD model)				Straight unit (RAS model)		
	Quantity of stands	P1	P2	P3	Quantity of stands	P1	P2
1.0 m	2	100	/	800	2	100	800
2.0 m	3	100	2000 or less	1000 or less (800 or less)	2	300	1400
3.0 m	3	100	2000 or less	1000 or less (800 or less)	2	500	2000
Maximum value	/	500	2000	1000	/	500	2000

Machine model code	Curve unit (RACD/RAC model)	Changing unit (RAE model)	Raising unit (RAU model)	Merging unit (RAJ model)	Splitting unit (RAB model)
Quantity of stands	2	2	1	3	3

NOTE:

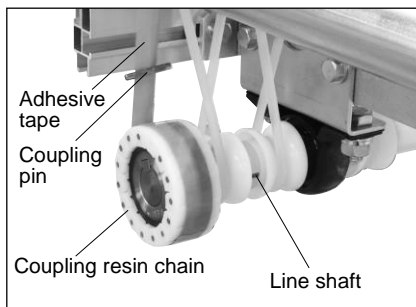
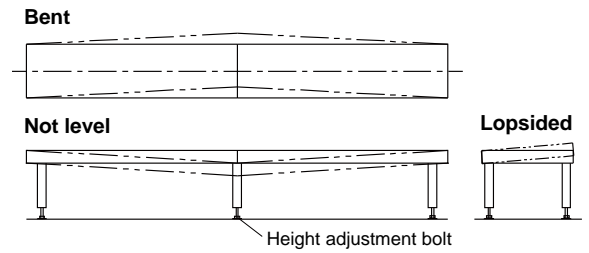
1. Values in () are for roller pitch of 50mm.
2. Values in tables are for single conveyor.
Except curve unit, when using some units connecting, it is possible to reduce quantity of stands by installing stands at frame joints.
3. Values in tables are for use within maximum conveying capacity.



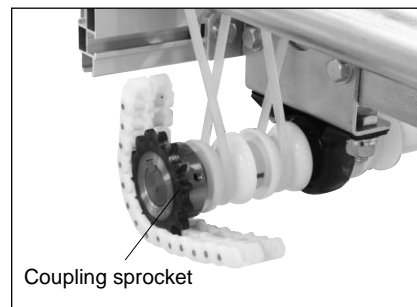
CONNECTING CONVEYOR UNITS

For machine exceeding 3m in length, it is delivered divided into some units of 3m or less. In this case connect conveyor units as follows:

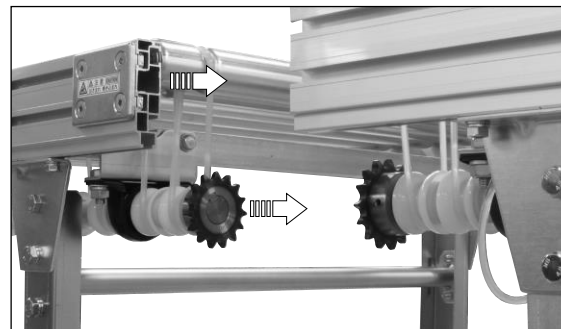
1. Place conveyor units in intended positions.
2. Set conveyor units to intended height with height adjustment bolts. (See middle right figure.) Make sure that full length of conveyor is level on top.
3. Remove adhesive tape temporarily fixing coupling resin chain. (Coupling pin fixed together with resin chain will be used later. Be sure to keep it.)
4. Remove coupling resin chain from coupling sprocket.
5. Correctly set conveyor joint.



Remove adhesive tape.

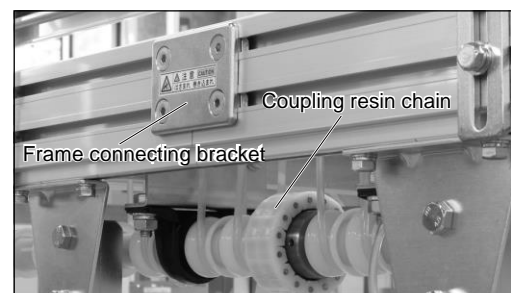
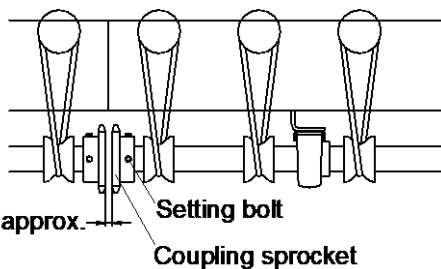


Remove coupling resin chain.



Correctly set divided frames and line shafts and connect them.

6. Adjust clearance between coupling sprockets to approximately 7mm. (Loosen setting bolts for adjustment. Once adjustment is complete, retighten setting bolts.)
7. Fix frame connecting brackets with bolts.
8. Connect divided line shafts by setting coupling resin chain to sprockets. (Coupling resin chain can be easily set to sprockets if the clearance made in step 6 is proper. Readjust it if difficult.)
9. Insert coupling pin removed in step 3 into coupling resin chain and fix it. (Insert coupling pin by gently tapping with a wooden hammer etc. so that resin chain will not break.)

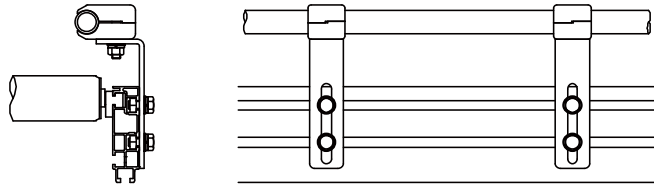


INSTALLING ATTACHMENT DEVICES

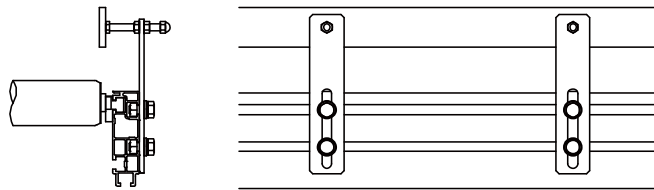
For attachment devices, install them by inserting nuts into frame slots. In this case insert nuts from frame end or use insert-able nuts (optional) which can be inserted from side of frame.

● Guide rails

eg G-SS2/G-SU2



eg G-A2B/G-P2FA/G-S2



Other optional devices:

- Running scraper (RARS)
- Traffic controller (RTFC)
- Turn roller (RTR)
- Stopper (RASTP)

RUNNING THE CONVEYOR

Start the conveyor after making sure of the items below.

Conveyor is correctly grounded:

- Correctly connect earth wire, otherwise there is considerable risk of electric shock. Be sure to ground earth terminal (green) of power cable.
- Power source of RINGLER is 200V three-phase. Standard machine has only lead wire terminal of motor. For constant speed type, switch etc. are not provided. When wiring, properly provide an earth on motor or drive cover.



■Earth and leakage breaker

Ensure the conveyor is connected to earth at all times to prevent electric shock. Also ensure that an earth leakage breaker is connected to the power supply.



■Emergency stop

Install an emergency stop device to immediately stop the conveyor in emergency.



■Start alarm

If it is not possible to supervise the operation of the full length of the conveyor from the operating position, install a start alarm for increased safety.

Conveyor is correctly installed:

Confirm full length of frame is level on top, straight and not bent in any place. Improper installation may cause unexpected accidents.

Conditions of rollers:

Check each roller for rotating conditions. Remove foreign substances if any. Replace with non-defective one if malfunctioning.

Loose or missing bolt and nut:

may cause parts to come off and frame to be twisted. Before starting the conveyor, retighten each bolt and nut. Attach spare bolt and nut if there are any missing ones.

Breakage of connector:

may cause electric leakage or damage of motor. Replace broken connector with non-defective one.

Trouble of electrical wiring:

There is considerable risk of electric leakage or shock. Make sure that there is no exposed part in electrical wiring.

Power source and voltage are correct:

Contact appropriate qualified specialists if not sure.

NOTE: For inverter variable speed type, also refer to instruction manual of inverter, appendix.

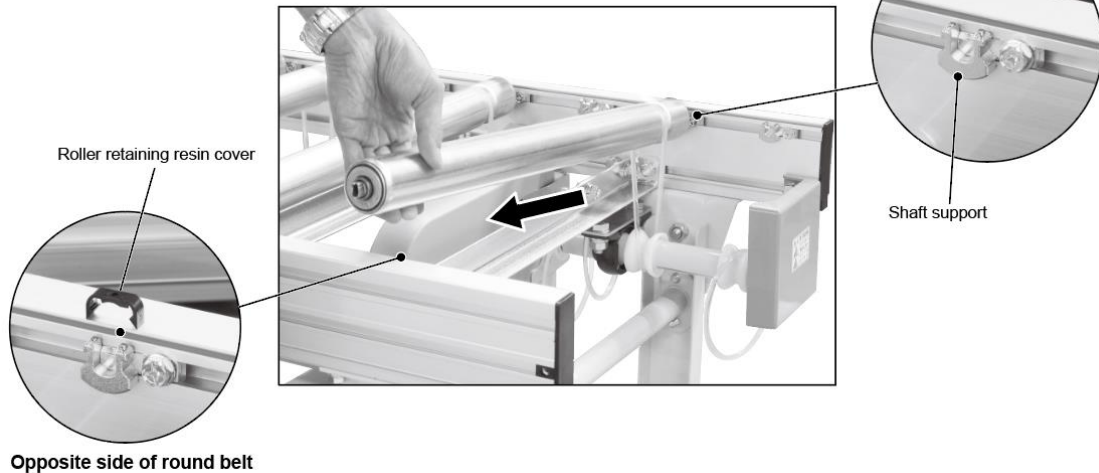
6

CARRYING ROLLER

1. REMOVAL AND INSTALLATION OF CARRYING ROLLER

- (1) Remove roller retaining resin cover.
- (2) Referring to the picture below, raise carrying roller on opposite side of round belt.
- (3) Pull carrying roller out of round belt in direction of arrow.

NOTE: Install carrying roller in reverse order. When installing, make sure that roller rotation direction is correct.



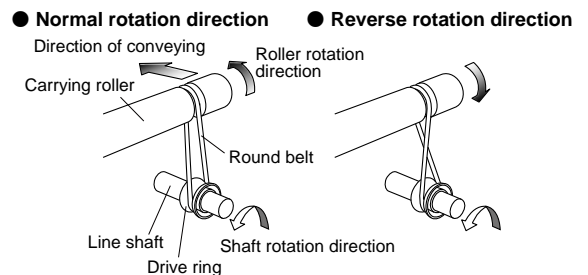
⚠ CAUTION

- Before starting procedures below, be sure to stop conveyor and switch off power supply, otherwise there is a risk of serious accident or injury by electric shock, entanglement, etc.
- Pay attention not to pinch you fingers, hands, etc.

2. CHANGING ROTATION DIRECTION OF CARRYING ROLLER (DIRECTION OF CONVEYING)

It is possible to change rotation direction of carrying roller (direction of conveying) by changing setting direction of round belt.

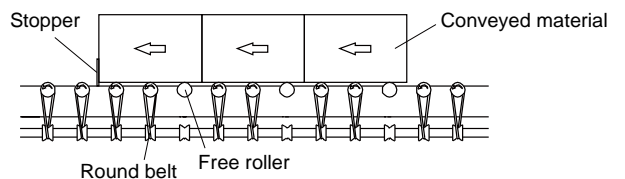
- (1) Remove carrying roller and pull it out of round belt.
- (2) Set round belt depending on intended rotation direction of carrying roller, as shown in figure right.
- (3) Reinstall carrying roller to frame.



3. STOPPING CARRYING ROLLER

By removing round belt, carrying roller becomes free roller (stopping roller) and it is possible to reduce conveying capacity or line pressure.

- (1) Remove intended round belt from carrying roller.
- (2) Move removed round belt to line shaft bearing and fix it with adhesive tape etc.

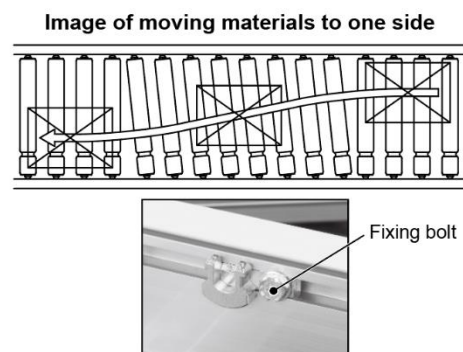


4. CHANGING ARRANGEMENT OF CARRYING ROLLERS

By setting carrying rollers diagonally, it is possible to move materials to one side while conveying them.

- (1) Remove carrying rollers.
- (2) Loosen fixing bolts of shaft supports.
- (3) Slide shaft supports to intended positions and re-fix them.

NOTE: Keep in mind that carrying roller may come off or conveying malfunction may occur by resistance of guide etc., depending on angle of carrying roller.



7

ROUND BELT REPLACEMENT

1. REPLACING WITH SPARE ROUND BELT

Spare round belt is attached between line shaft bearings. (It has already been installed to line shaft and attached on line shaft bearing.)

- (1) Remove round belt to be replaced. Between spare round belt and its installation position, remove all the round belts from carrying rollers.
- (2) Move spare round belt to installation position.
- (3) Set all the round belt correctly.

NOTE:

1. Set round belts so that their rotation directions will become correct. (See p.15.)
2. In early period of operation, round belts occasionally look to be about to come off carrying rollers. However this movement will disappear as operating time becomes longer.

2. INSTALLING REPLACEMENT ROUND BELT FROM OUTSIDE OF CONVEYOR

- (1) Remove coupling resin chain. (See p.12.)
- (2) Remove round belt to be replaced. Between coupling sprocket and installation position of replacement round belt, remove all the round belts from carrying rollers.
- (3) Insert replacement round belt from clearance between coupling sprockets. (If installation position is over line shaft bearing, make another clearance to pass replacement round belt by removing attachment bolt from line shaft bearing.)
- (4) Move replacement round belt to installation position.
- (5) If attachment bolt of line shaft bearing has been removed, retighten it.
- (6) Set all the round belt correctly.

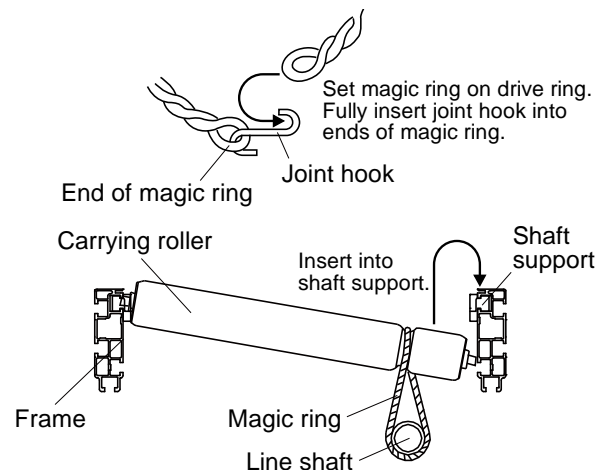
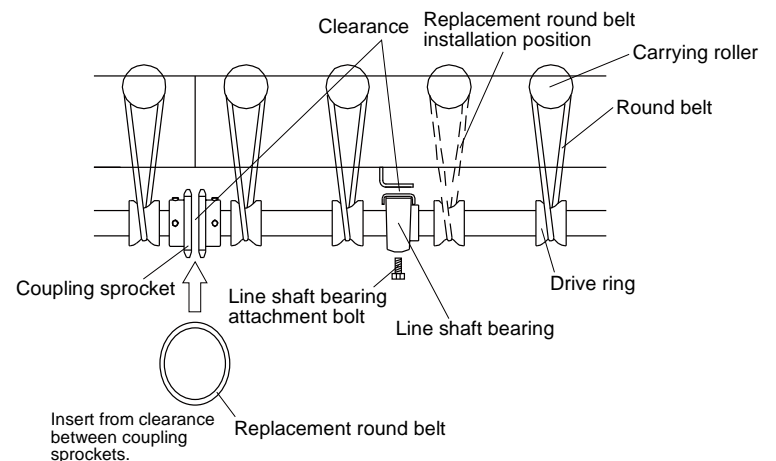
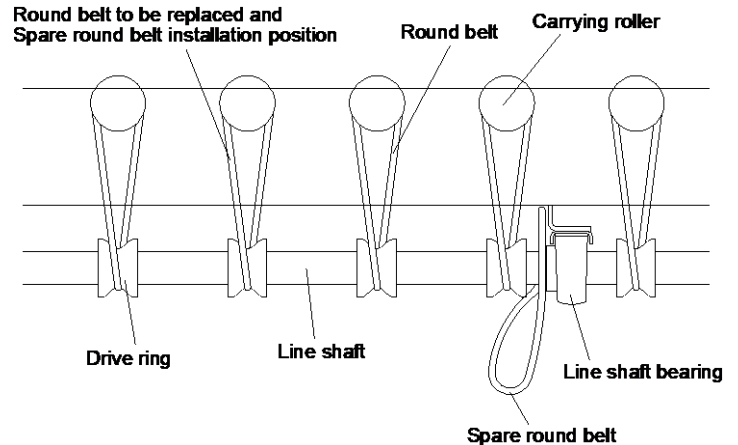
3. USING MAGIC RING

Magic ring is a temporary part and used when spare round belt is not prepared. Since magic ring is not as durable as round belt, use it only in emergency.

- (1) In replacement position, set magic ring on drive ring and connect its both ends with a joint hook.
NOTE: Fully insert joint hook into ends of magic ring so that it will not come off.
- (2) Confirm direction of conveying and set magic ring on carrying roller.
- (3) Reinstall carrying roller in initial position.

CAUTION

- Before starting procedures below, be sure to stop conveyor and switch off power supply, otherwise there is a risk of serious accident or injury by electric shock, entanglement, etc.
- Pay attention not to pinch you fingers, hands, etc.



8-1. PROBLEMS AND REMEDIES

PROBLEM	CAUSE	REMEDY
1. Conveyor does not run. (Conveyor cannot be turned on.)	(1) Power plug is not properly connected to the mains. (2) Power switch is not turned on. (3) Inappropriate power source (4) Disconnection or breakage in wiring	(1) Inspection, correction (2) Inspection, correction (3) Check power source. Change to correct one if necessary. (4) Rewiring or repair
2. Carrying roller does not rotate.	(1) Round belt has come off. (2) Round belt is slipping in groove of carrying roller. (3) Drive ring is slipping on line shaft.	(1) Reset round belt. (Pay attention to direction of conveying. see p.16) (2) Clean round belt and groove of carrying roller. (3) Clean line shaft by wiping with a dry cloth.
3. Line shaft does not rotate.	(1) Coupling has come off. (2) Sprocket retaining key has come off.	(1) Reinstallation (see p.12) (2) Reinstallation
4. Materials are not conveyed.	(1) Overload (2) Foreign substances on carrying rollers	(1) Reduce load. (2) Remove any foreign matter and clean carrying rollers.
5. Abnormal noise of drive unit	(1) Drive chain has become loose or worn. (2) Installation condition of geared motor has become loose. (3) Foreign substances in drive unit	(1) Adjust tension of drive chain and apply oil. (2) Retighten attachment bolts. (3) Remove any foreign matter and clean drive unit
6. Electric shock is received from conveyor.	(1) Static electricity has been charged in conveyor. (2) Electric leakage	(1) Make inspection and investigation. Properly ground the conveyor. (see p.14) (2) Make inspection and investigation. Properly ground the conveyor.

8-2. ITEMS FOR REGULAR INSPECTION

CHECKING PERIOD	PART TO CHECK	THINGS TO CHECK FOR	CHECKING METHOD	REMEDY	
Daily	Round belt	Expansion, wear, crack	Visual inspection	Replacement	
Monthly	Carrying roller	Foreign substances	Visual inspection	Remove any foreign matter and clean.	
		Wear of bearing	Visual inspection	Replacement	
	Line shaft coupling	Dislodgement of coupling pin	Visual inspection	Reinstallation	
		Crack of resin chain	Visual inspection	Replacement	
Three monthly	Drive chain	Looseness	Visual inspection and manual check	Adjustment or replacement	
		Wear	Visual inspection	Replacement	
		Abnormal noise	Visual inspection and listening	Lubrication, adjustment or replacement	
	Universal joint	Abnormal noise	Visual inspection and listening	Lubrication, adjustment or replacement	
	Geared motor	Oil leakage	Visual inspection	Replacement	
		Abnormal noise	Listening	Retighten bolts.	
		Overheat	Manual check	Disassemble to inspect. Replace if necessary.	
	Line shaft bearing	Looseness	Visual inspection and manual check	Retightening bolts, adjustment or replacement	
		Abnormal noise	Listening	Disassemble to inspect. Replace if necessary.	
		Overheat	Manual check	Disassemble to inspect. Replace if necessary.	
	Six monthly	Frame, stand, cover and other attachments	Looseness	Visual inspection	Retightening bolts, adjustment
			Deformation	Visual inspection	Repair or replacement
Damage			Visual inspection	Repair or replacement	

MEMO

Customer Center

TEL +81-46-273-8989 FAX +81-46-273-8990

URL <https://www.hansou.jp>

E-mail kikaiinfo@eng.sanki.co.jp



[hansou.jp](https://www.hansou.jp)



Contact us

- Particular attention is given to the manufacture and transportation of SANKI conveyors. However, if you need any information about the use or failure of the machine or any other matters, please contact our customer service. Also do not hesitate to ask us for information about conveyors in general.
- The specification given in this manual are subject to change without notice.