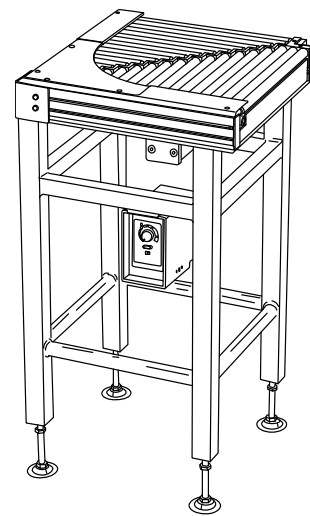
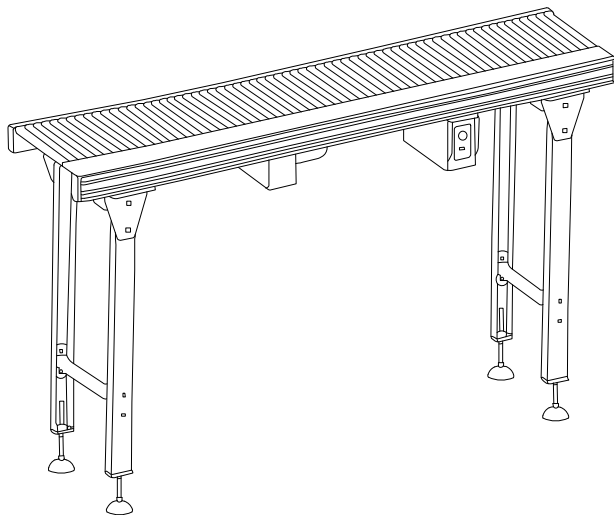


Sanki Non-contact Magnetic Drive Conveyor

MAGDRIVE

(CLAM, CLDM and CLAMC models)

OPERATING AND SERVICE MANUAL



Thank you very much for purchasing our SANKI Non-contact Magnetic Driving Conveyor **MAGDRIVE**. 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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8. Take-up and Replacement of Timing Belt	22
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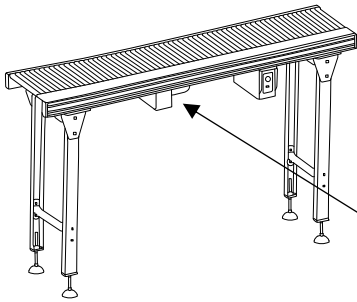
For the following models, refer to the separate operating and service manual:

Sanki Clean Conveyor

Applied models: CLAA, CLAD and CLAC models

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.

NOTE: To order spare parts, please include the serial number and model code found in the **serial number and model label** in your order sheet.



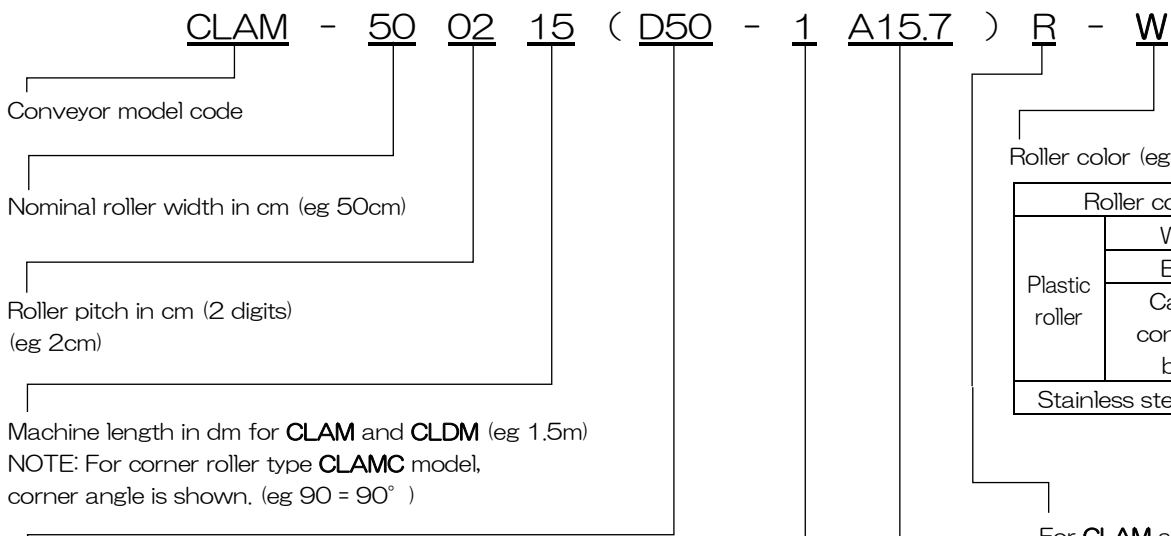
Serial number and model label
(affixed to side of drive cover)

[Example]

Date of production 20□□. □□
JOB NO. □□-□□□□□□-□□□□-□□
CLAM-500215 (D50-1A15.7) R-W

Manufacturer's serial number

(refer to this number when contacting us)



Motor type and Motor output
(eg Brushless inverter variable speed, 50W)

Motor type	Motor output	Code
Constant speed	25W	C25
Brushless inverter variable speed	50W	D50

Power source
(eg 200V three-phase)

Power source type	Code
100V single-phase	1
200V single-phase	2
200V three-phase	3
other	0

Roller color (eg White)

Roller color		Code
Plastic roller	White	W
	Black	B
	Carbon contained black	BE
Stainless steel roller		(none)

For **CLAM** and **CLDM** models,
Direction of line shaft
(eg. Right)

Direction of line shaft	Code
Right	R
Left	L

For corner roller type **CLAMC** model,
Direction of conveyor travel
(eg Clockwise)

Direction	Code
Clockwise	R
Counterclockwise	L

Power source frequency and belt speed in m/min
(eg 50Hz, 15.7m/min)

Frequency	Code
50Hz	A
60Hz	B

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**

Use the conveyor indoors and prevent it from getting wet. 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.)

■Do NOT allow objects such as a pacemaker to get close to the magnets

The magnets are attached to the carrying rollers and line shafts of conveyor. Do NOT allow objects, which could be affected by magnetic fields, to approach within 5 cm of the magnets.

 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.










■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 allow objects such as a pacemaker to get close to the magnets. The magnets are attached to the carrying rollers and line shafts of conveyor. DO NOT allow objects, which could be affected by magnetic fields, to approach within 5 cm of the magnets.
	■ 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.
	■ Toppling prevention 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

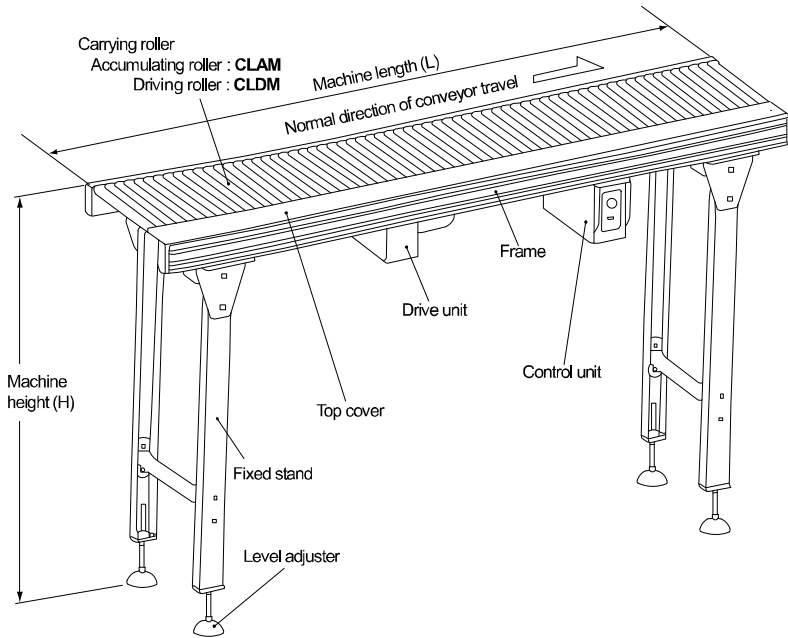
	CAUTION : Improper handling of the conveyor may result in physical injury or damage!
	■ Switch off the power after use Ensure that the power is switched off when carrying out relocation, inspection, cleaning, etc. of the conveyor, otherwise there is a risk that the conveyor could start unexpectedly. 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.

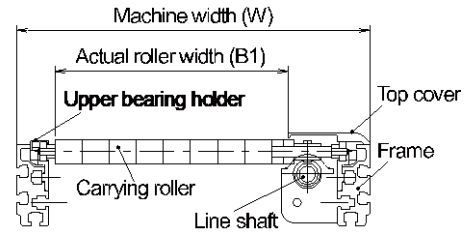
2

COMPONENT NAMES

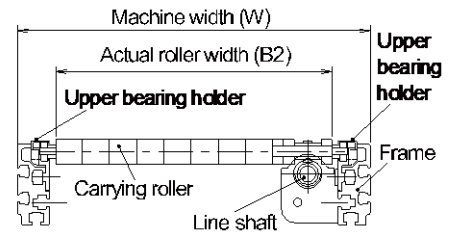
2-1. ACCUMULATING TYPE CLAM MODEL AND LIVE ROLLER TYPE CLDM MODEL



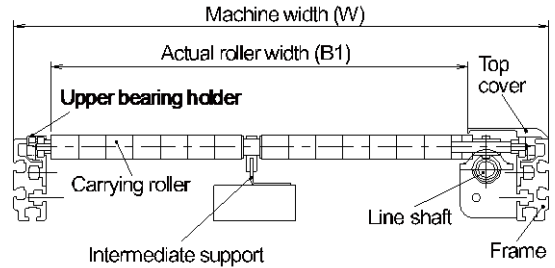
● Machine with top cover



● Machine with no top cover

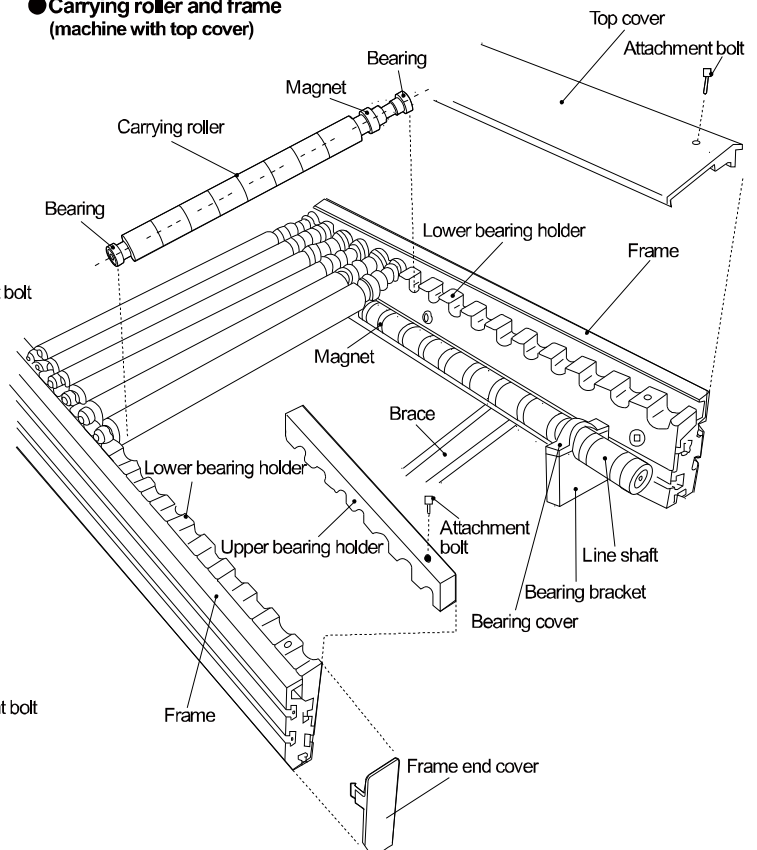


● Machine with intermediate support (machine with top cover)



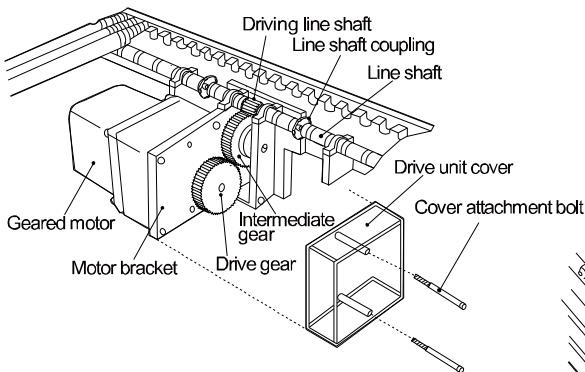
Cross section

● Carrying roller and frame (machine with top cover)

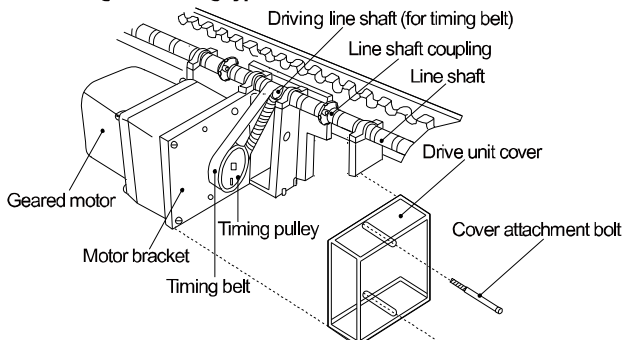


Drive Unit Section

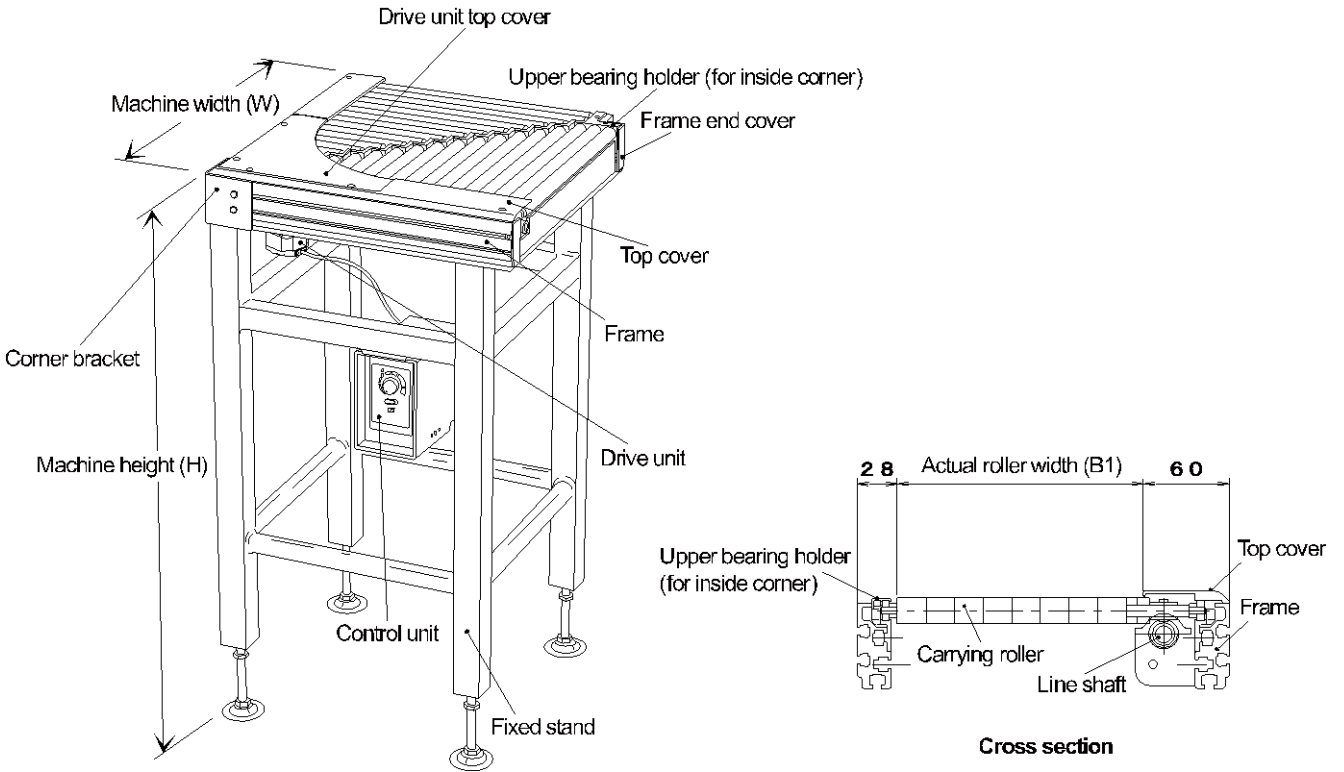
● Gear driving type



● Timing belt driving type

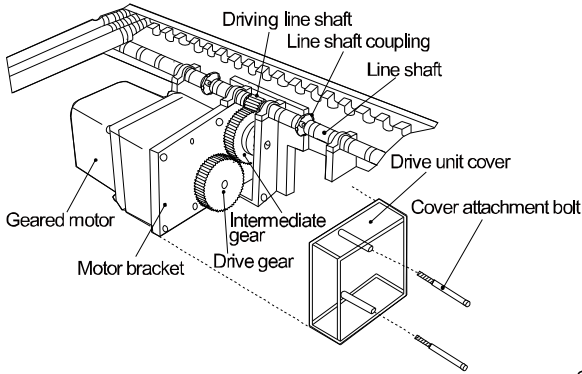


2-2. CORNER ROLLER TYPE CLAMC MODEL

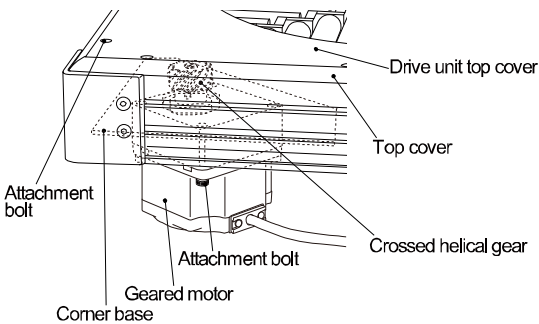


Drive Unit Section

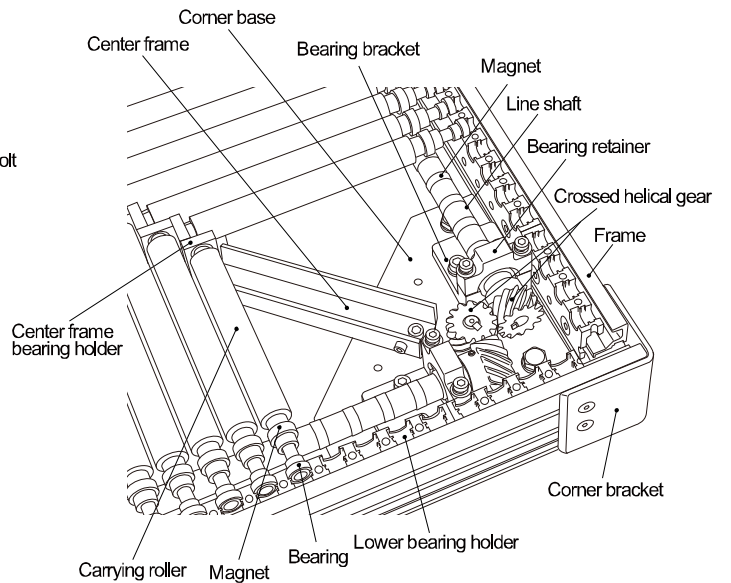
● Double drive type



● Single drive type



● Carrying roller and frame (single drive type)



3

ASSEMBLY



■ 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.

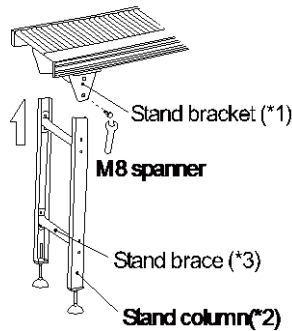
3-1. INSTALLING STANDS

(for accumulating type CLAM and live roller type CLDM)

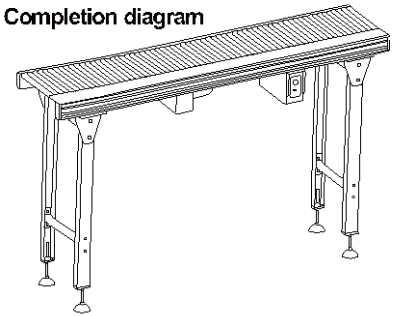
NOTE: Stands are delivered in separate packaging.

Stand brackets(*1) are fixed to conveyor frame. Attach stand columns(*2) together with stand braces(*3) to these brackets, with bolts and nuts(M8).

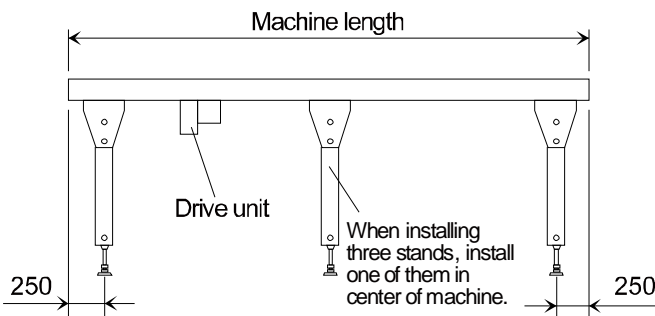
● Installing stands



Completion diagram



● Standard installation positions of stands



● Quantity of stands by machine length

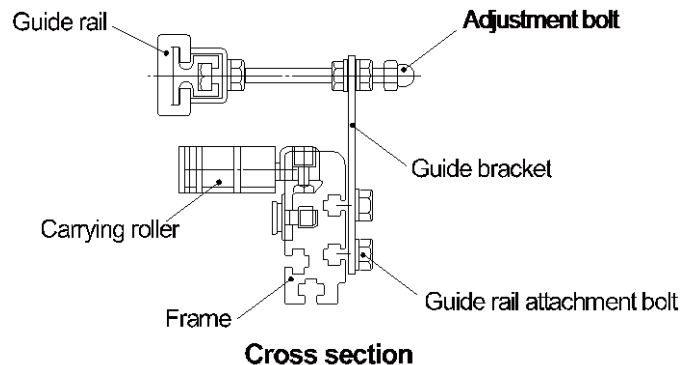
Machine length (m)	0.72-2.24	2.28-3.0
Quantity of stands	2	3

NOTE: When changing installation positions of stands, pay special attention to balance of conveyor for safety.

3-2. INSTALLING GUIDE RAILS (OPTIONAL)

Install guide rails (optional) into frame slots as shown in figure to right.



● Installing guide rails (optional) eg G-P2FA type



3-3. CONTROL UNIT INSTALLATION

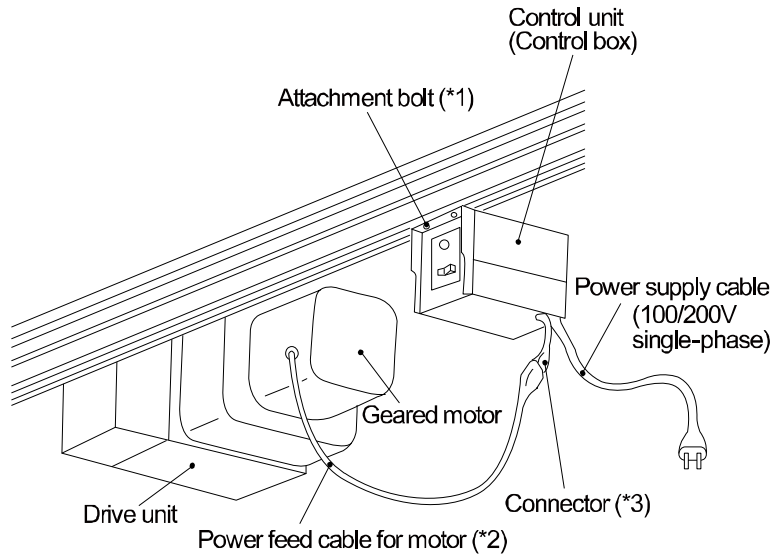
When power source is 100/200V single-phase and control unit (control box) is delivered in separate packaging, install control unit as follows.

NOTE: For 200V three-phase power source, standard machine has only wires from motor. Control devices (switch etc.) are optional.

 CAUTION		<p>■BE SURE TO SWITCH OFF POWER SUPPLY Before starting procedures below, be sure to stop conveyor and switch off power supply. In addition, make sure plug is removed from outlet/connector. If connected to power supply, there is a risk that conveyor may start unexpectedly.</p>
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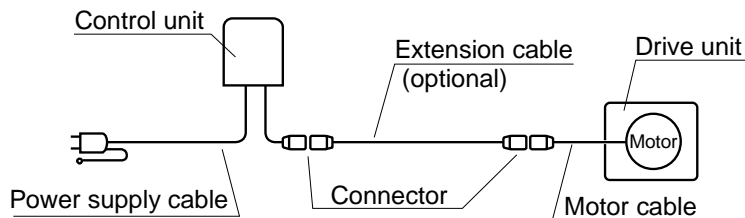
For constant-speed type and speed-controller variable-speed type:

1. Place control unit (control box) near drive unit. Install control unit by fixing attachment bolts(*1) into underside slot of frame.
2. Power feed cable(*2) is coming out of drive unit. Put power feed cable connector into control unit connector(*3). (Connect tightly.)



NOTE: If it is necessary to install control unit separately from drive unit, use extension cable (optional) to make connection as shown in figure left. (If necessary, remove control unit cover to connect connectors. In this case be sure to reinstall control unit cover.)

●Connection of control unit and motor unit



4

RUNNING THE CONVEYOR

4-1. BEFORE OPERATION

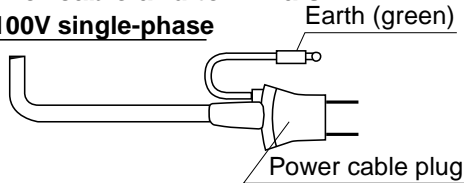
100V single-phase power source : Ground earth terminal (green) of power cable plug.

200V single-phase power source : Ground earth terminal (green) of power cable.

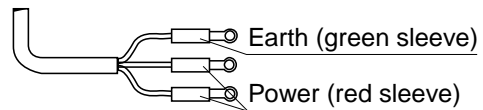
200V three-phase power source : For variable-speed type, ground earth terminal (green) of power cable.
For constant-speed type, machine does not have switch etc. Provide an earth cable on motor or drive unit side plates when wiring.

● Power cable and terminals

AC 100V single-phase



AC 200V single-phase



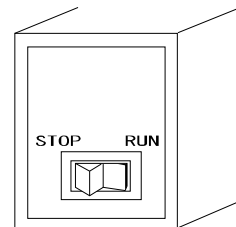
4-2. STARTING CONVEYOR

1. Constant-speed Type (100/200 V single-phase)

Push illuminating-start switch into “RUN” position. To stop machine, push it to “STOP” position.

NOTE: This switch is not for turning power on and off. When leaving conveyor unused for a long period, make sure that it is unplugged or main switch is off.

● Constant-speed type



Illuminating start switch

2. Brushless-inverter Variable-speed Type

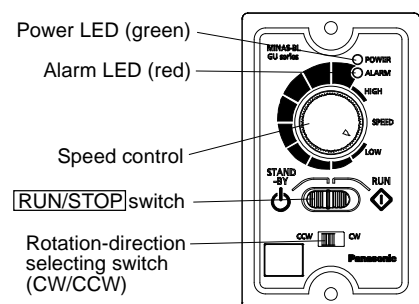
For brushless-inverter (inverter for brushless-motor variable-speed control) variable-speed type, operate machine as follows:

NOTE: 1. Be sure to combine brushless inverter with specified brushless motor.

2. Be sure to ground before use.

- (1) Make sure RUN/STOP switch on brushless-inverter operating panel is in “STOP” position. Turn on power supply and ensure that power LED (power-on indicator) is illuminated in green.
- (2) Set RUN/STOP switch to “RUN” position. Motor will start rotating and conveyor will run.
- (3) To increase speed, turn speed control clockwise; to decrease speed, turn it counterclockwise. Set appropriate speed for intended use.
- (4) To stop conveyor, set RUN/STOP switch to “STOP” position.

● Brushless-inverter operating panel



- NOTE: 1. Be sure to confirm that the power source voltage is within the rated voltage range, before turning ON the power source.
2. Be sure to start and stop the conveyor with RUN/STOP switch. When starting and stopping the machine by external signals, use control circuit terminals on rear of inverter. (→See “Starting and Stopping the Conveyor by External Signals” , p.12.)
3. When leaving the conveyor unused for a long period, make sure that the power supply is off. (The RUN/STOP switch is not for turning the power on and off.)
4. Before turning off the power supply, be sure to set RUN/STOP switch to “STOP” position, otherwise there is a risk that the motor will restart rotating unexpectedly when powered. Moreover make sure that RUN/STOP switch is in “STOP” position before turning on the power supply.

Brushless-inverter standard specification		
Applied motor		Brushless motor 50W
Power source	Voltage	Single-phase AC100-120V Single-phase/three-phase AC200-240V
	Permissible voltage range	±10%
	Frequency	50/60Hz
Variable-speed range		General change gear ratio 1:76 (Maximum change gear ratio 1:100)
Environmental conditions	Ambient temperature	-10°C to +40°C (Avoid freezing.)
	Ambient humidity	Relative humidity 85% max. (Avoid condensation.)
	Atmosphere	Indoor (Avoid splash of liquids, corrosive/flammable gases, dust, etc.)
	Elevation	1000m or less

■ Variable-speed Range of Brushless-inverter

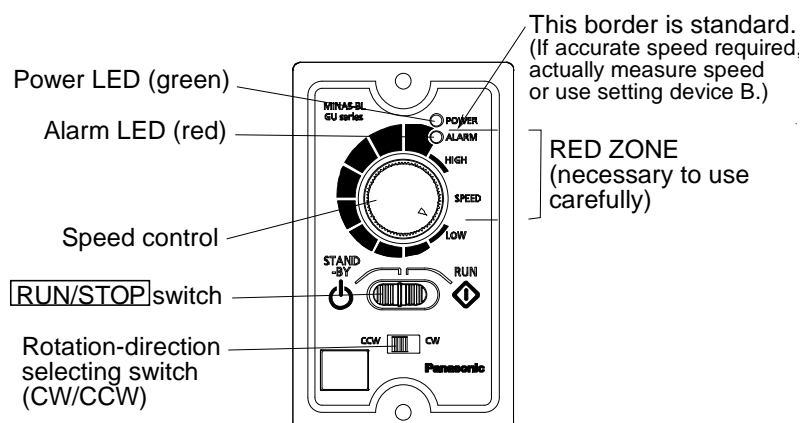
(Torque at high speed can be used at low speed as well.)

Nominal speed (motor rotation: 2300 r/min) is determined as the lower limit of RED ZONE. Variable-speed range up to the lower limit of RED ZONE is 1:76 (motor rotation: 30-2300 r/min).

By using RED ZONE up to the upper limit, it is possible to vary speed up to 1.3 times of nominal speed (variable-speed range: 1:100, motor rotation: 30-3000r/min).

NOTE: Since motor rotation increases as the speed gets closer to the upper limit of RED ZONE, this will increase noise and shorten service life of gear head. Use the machine at appropriate speed to avoid these troubles.

● Brushless-inverter operating panel

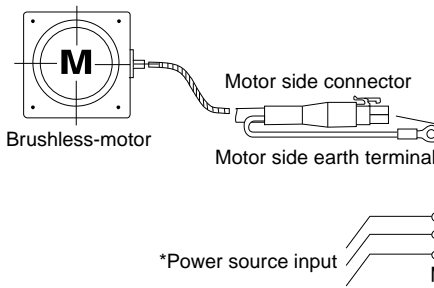


■ Starting and Stopping the Conveyor by External Signals

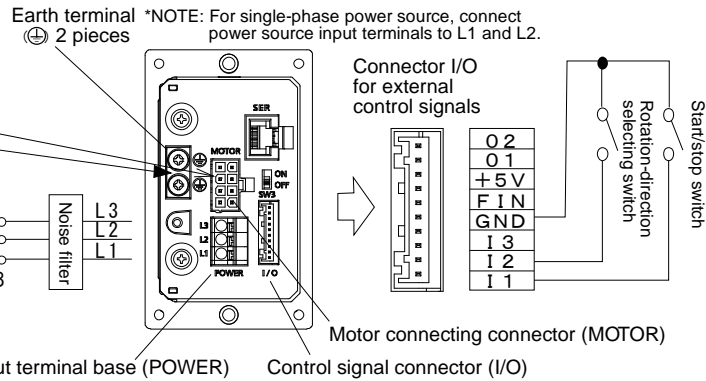
When starting and stopping the conveyor frequently in a short period (tact operation etc.), it is impossible to start and stop the machine by turning on/off the power supply. (The controller may get damaged and trip.) In this case be sure to start and stop the machine by external signals. For start and stop circuit by external signals, make connection to external control circuit terminals on rear of brushless inverter.

NOTE: Do not start and stop the conveyor excessively frequently. It may cause machine failure or shorten its service life.

● Standard connection diagram of brushless-motor and power source (eg 200V three-phase)



● Standard connection diagram for starting/stopping conveyor by external signals (eg Reversible operation)



Rear of brushless-inverter

When using connector I/O for external control signals, purchase "Cable for control signals (cable with I/O connector) Item number: DV0PM20076" sold separately.

NOTE:

1. Be sure to ground earth. (D-type grounding, 100Ω or less, $\phi 1.6\text{mm}$ or more)
 2. Noise filter, NFB, etc. should be set up by user.
 3. When making connection to external control terminals, use special cable for external control (optional).
 4. For reversible operation by external signals, set rotation-direction selecting switch to CCW.
- For details, refer to "Brushless-inverter instruction manual", appendix.

■ Caution When Using brushless inverter



CAUTION

1. Be sure to confirm that the power source voltage is within the rated voltage range, before switching ON the power source.
(Voltage exceeding the rated voltage could cause fuming, abnormal noise, etc.)
2. Be sure to start and stop the conveyor with RUN/STOP switch. If installing a separate RUN/STOP switch and operating the machine by external control, be sure to use the control circuit terminal on the rear of controller unit. (For reversible operation, set the reverse switch to CCW.)
3. The RUN/STOP switch of control unit is not for turning the power on and off. When leaving the conveyor unused for a long period, make sure that the mains is off.
4. Do not run the conveyor at excessively low speed for a long period, or start and stop the conveyor excessively frequently. These may cause machine failure or shorten its service life.
5. Do not touch the inverter radiator of side of control unit, and do not allow any material to touch it, because of its high temperature.
6. Use the control unit within the permissible range of ambient temperature (from -10°C to $+40^{\circ}\text{C}$). Avoid freezing.
7. Pay special attention not to allow any foreign matter (dust, iron powder, etc.) to get into the control unit.
8. Operating the motor using the inverter could cause noises from the inverter I/O cables, motor, etc. Keep in mind that these could interfere with the correct operation of other electronic devices. (In this case, noises and their effects can be suppressed to some extent by providing the inverter I/O with a filter or otherwise shielding the power cable.)

For details, refer to "Brushless-inverter instruction manual", appendix.

■ Circuit Protector

(1) Constant-speed Type

To prevent motor from burning out due to overload etc., it is recommended to provide the machine with a circuit protector (optional). When protector is activated and conveyor stops, reset button pops out. In this case always switch off power and set RUN/STOP switch to “STOP”. Reset button may be pressed in to restore circuit, and machine can be restarted by setting RUN/STOP switch to “RUN”.

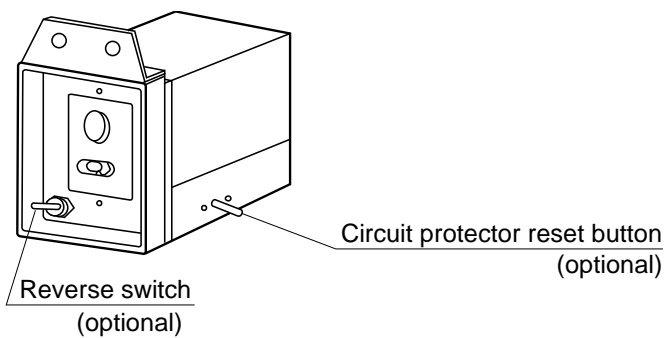
NOTE: Before restarting machine, carefully check for cause of stoppage and ensure it is removed.

(2) Brushless-inverter Variable speed Type

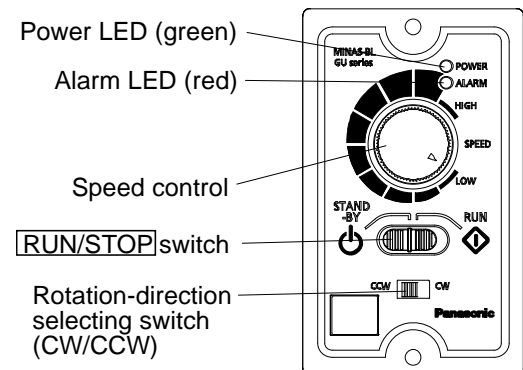
Brushless-inverter has built-in protective function against overload, overcurrent, overheat, etc. In emergency, brushless-inverter trips and alarm LED is illuminated in red.

- NOTE: 1. When brushless-inverter trips, immediately set RUN/STOP switch to “STOP” position and turn off power supply. Before restarting machine, carefully check for cause of trip and ensure it is removed.
2. When voltage is insufficient, alarm LED is illuminated in red. However, brushless inverter does not trip in standard circuit.
3. For increased safety, separately install overcurrent protective device on power source side.

● Constant-speed Type



● Brushless-inverter Variable speed Type



4-3. CHANGING DIRECTION OF CONVEYOR TRAVEL

1. Machine with Reverse Switch (optional)

(1) Constant-speed Type

To change direction of conveyor travel, operate the reverse switch of control unit.

NOTE: Before operating reverse switch, be sure to stop the conveyor by setting RUN/STOP switch on operating panel to "STOP" position.

(2) Brushless-inverter Variable-speed Type

To change direction of belt travel, slide the reverse switch on inverter operating panel from CCW to CW (or from CW to CCW).

NOTE: Before operating the reverse switch, be sure to stop the conveyor by setting RUN/STOP switch on operating panel to "STOP" position. (For brushless-inverter, if the set position of reverse switch is changed while RUN/STOP switch is in "RUN" position, belt running will be rapidly reversed and the inverter may trip due to inertia of load. In this case alarm LED will be illuminated in red.)

2. Machine without Reverse Switch

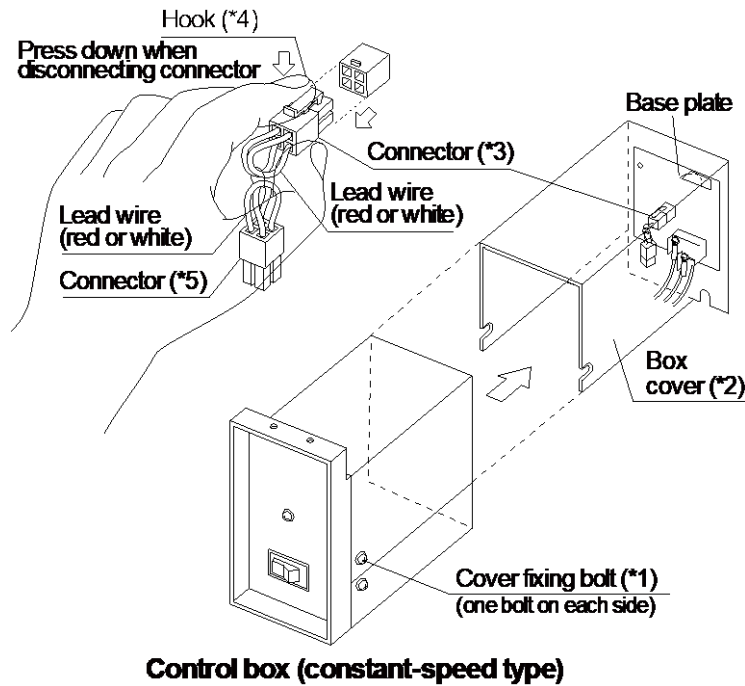
To change direction of belt travel, remove control box cover and change electrical wiring connections as follows:

■ Control Box Cover Removal

Loosen cover fixing bolts(*1) (one bolt on each side) and remove the cover(*2) sideways. (If difficult, remove the entire control box from frame, and then remove fixing bolts and cover. In this case do not loosen any of the other bolts on sides of control box.)

Changing Electrical Wiring Connections (constant-speed type):

Connector(*3) is found in center of base plate inside box cover(*2). Press down hook(*4) on the top with your finger and disconnect connector(*3) from base plate. Then replace it with connector(*5), which is attached to connector(*3). (Connectors(*3, *5) can be identified by lead wire colors, red or white.)



MEMO

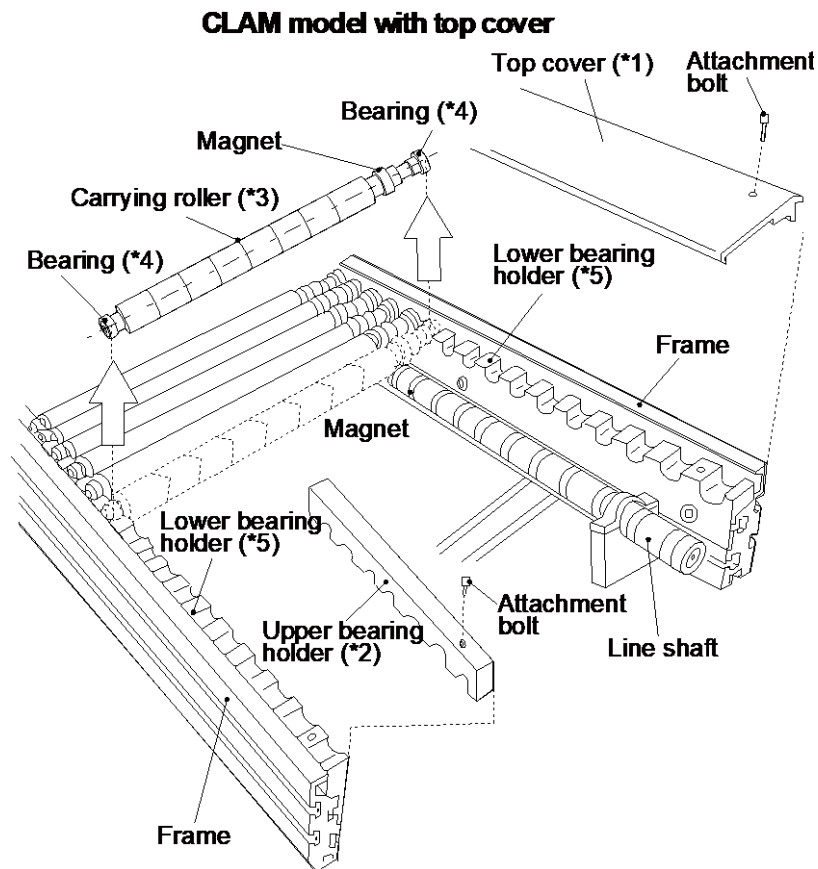
5

CARRYING ROLLER REPLACEMENT

Replace broken/defective carrying roller as follows:

5-1. ACCUMULATING TYPE CLAM MODEL

1. For machine with top cover(*1): To expose broken/defective carrying roller, remove top cover(*1) by loosening attachment bolts with a hexagonal wrench. On the other side of conveyor, remove upper bearing holder(*2) by loosening attachment bolts with a hexagonal wrench.
2. For machine with no top cover: On both sides of conveyor, remove upper bearing holders(*2) attached over broken /defective carrying roller by loosening attachment bolts with a hexagonal wrench.
3. Hold both ends of broken/defective carrying roller (*3), and raise the entire carrying roller vertically. Bearings(*4) of both roller ends will then be detached from lower bearing holders(*5) and roller can be removed.
4. To install replacement carrying roller(*3), simultaneously insert roller end bearings(*4) into slots of lower bearing holders(*5) on both sides of the conveyor.
5. Make sure that both bearings(*4) are correctly inserted in slots of lower bearing holders(*5). Reinstall parts removed in steps above (upper bearing holder(*2), top cover(*1), etc.) in initial positions.



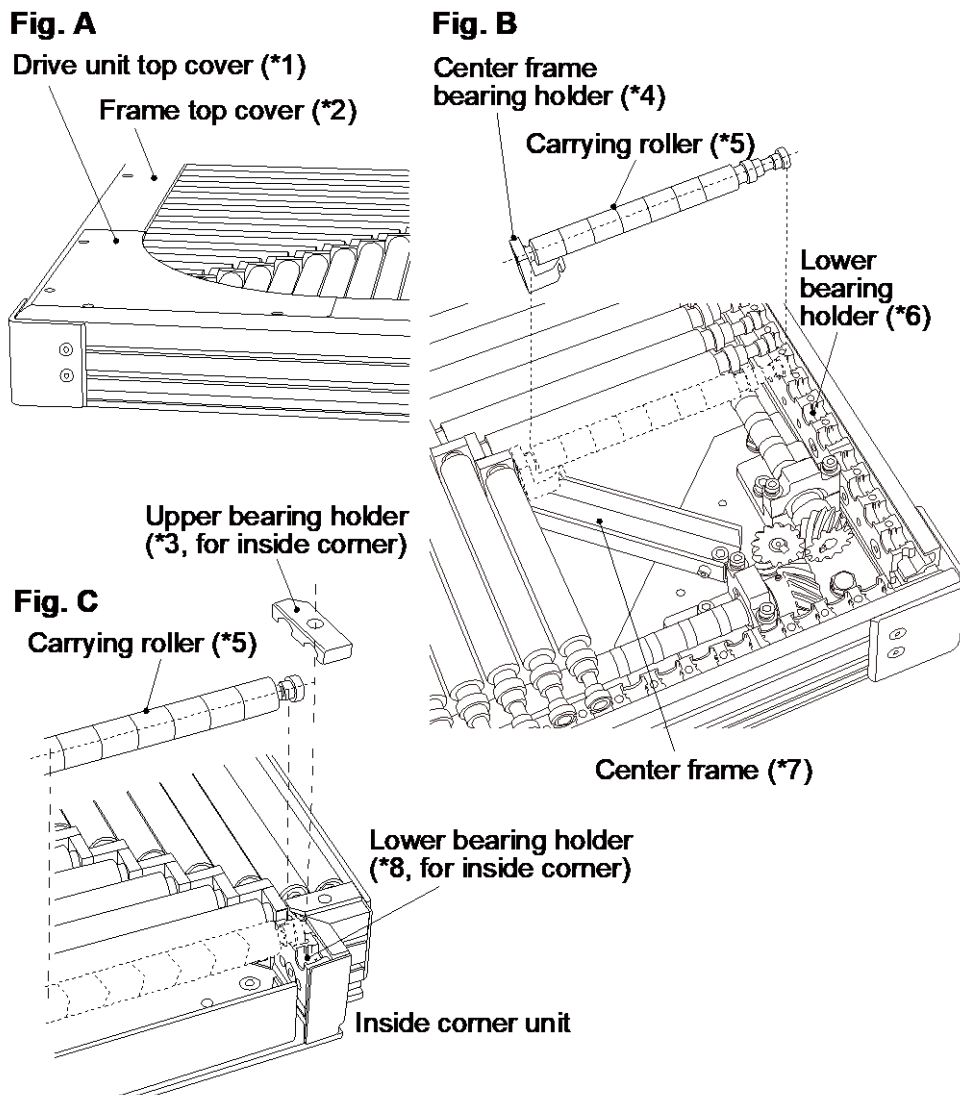
5-2. CORNER ROLLER TYPE CLAMC MODEL

● Carrying Roller with Center Frame Bearing Holder

1. Remove drive unit top cover(*1) and frame top cover(*2) by loosening attachment bolts with a hexagonal wrench.
2. Remove broken/defective carrying roller(*5) by vertically raising it together with center frame bearing holder(*4).
3. Remove center frame bearing holder(*4) from the removed carrying roller(*5). Push out and remove bearing from center frame bearing holder(*4).
4. Attach center frame bearing holder(*4) to replacement carrying roller(*5).
5. Referring to fig. B, simultaneously insert both ends of replacement carrying roller(*5) into slots of center frame(*7) and lower bearing holder(*6).
6. Reinstall drive unit top cover(*1) and frame top cover(*2) in initial positions.

● Carrying Roller Attached to Inside Corner Unit

Referring to fig. A and fig. C, remove drive unit top cover(*1), frame top cover(*2) and upper bearing holder(*3, for inside corner) by loosening attachment bolts with a hexagonal wrench. Following steps 3 to 5 on p.19, similarly replace carrying roller.



6

GEARED MOTOR REPLACEMENT

BE SURE TO SWITCH OFF POWER SUPPLY

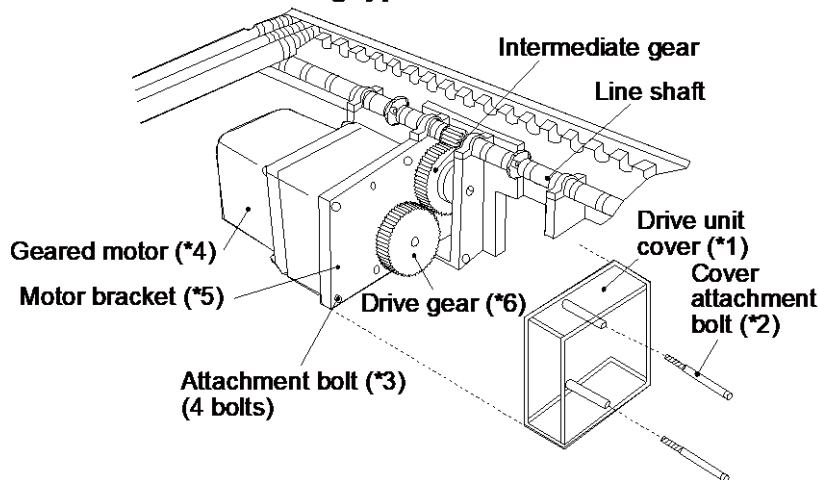
Replace geared motor by following the procedures below. If difficult, these procedures can be made easier by removing top cover, upper bearing holder and some carrying rollers near drive unit.

NOTE: For carrying roller removal, see p.16.

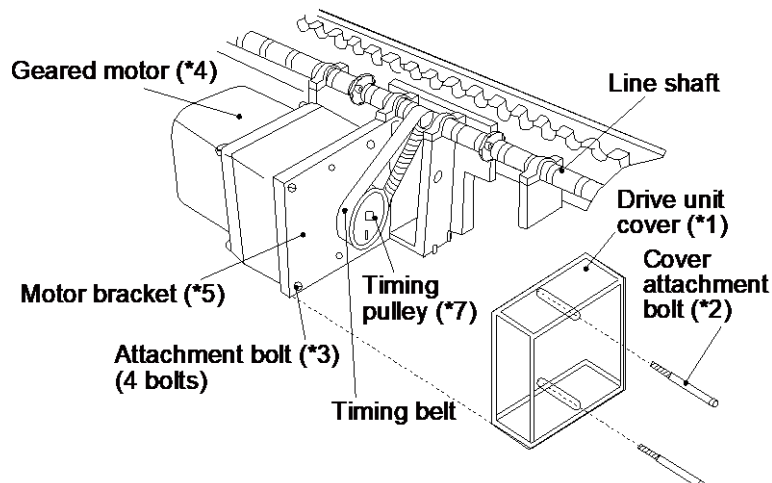
6-1. ACCUMULATING TYPE CLAM MODEL

1. Remove drive unit cover(*1) by loosening cover attachment bolts(*2).
2. For gear driving type, remove drive gear(*6). For timing belt driving type, remove timing pulley(*7).
3. Remove geared motor(*4) by loosening attachment bolts(*3, 4 bolts).
4. Disconnect cable coming out of geared motor from control unit.
5. Tightly fix replacement geared motor(*4) to motor bracket(*5) with attachment bolts(*3, 4 bolts).
6. Reinstall drive gear(*6) or timing pulley(*7) removed in step 2 above in initial positions. In this case make sure that meshing of drive gear and intermediate gear is correct or that timing belt tension is properly set. (For timing belt tension, see p.22, "8-1. TAKING UP TIMING BELT")
7. Connect cable of newly installed geared motor to control unit. (For 100/200V single-phase, see p.10.)
8. Reinstall drive unit cover(*1) in initial position with attachment bolts(*2). When carrying rollers, top cover and upper bearing holder, etc. were removed to make procedures easier, reinstall all of them in initial positions.

● Gear driving type



● Timing belt driving type



6-2. CORNER ROLLER TYPE CLAMC MODEL

● Single Drive Type

1. Remove drive unit top cover(*1) by loosening attachment bolts with a hexagonal wrench.
2. Remove geared motor(*3) by loosening attachment bolts(*2, 4 bolts).
3. Disconnect cable(*6) coming out of geared motor from control unit.
4. Remove crossed helical gear(*4) from geared motor(*3) removed in step 2 above.
5. Attach crossed helical gear(*4) (removed in step 4) to replacement geared motor.
6. Attach geared motor(*3) to corner base(*5) by tightening attachment bolts(*2, 4 bolts). (Make sure that crossed helical gear of geared motor and line shaft side crossed helical gear are properly meshed.)
NOTE: Keep in mind that insufficient clearance between the crossed helical gears will cause premature wearing of gears.
7. Connect cable(*6) of newly installed geared motor to control unit. (For 100/200V single-phase, see p.10.)
8. Reinstall drive unit top cover(*1) in initial position with attachment bolts.

● Double Drive Type

Follow the procedures for gear driving type on p.18 and similarly replace geared motor.

Single drive type CLAMC

Appearance diagram

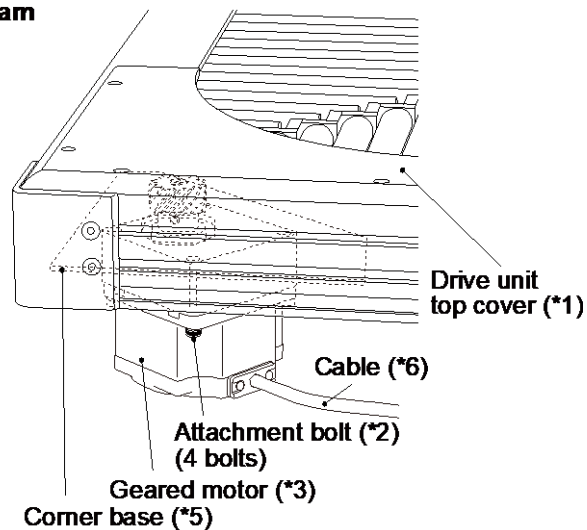
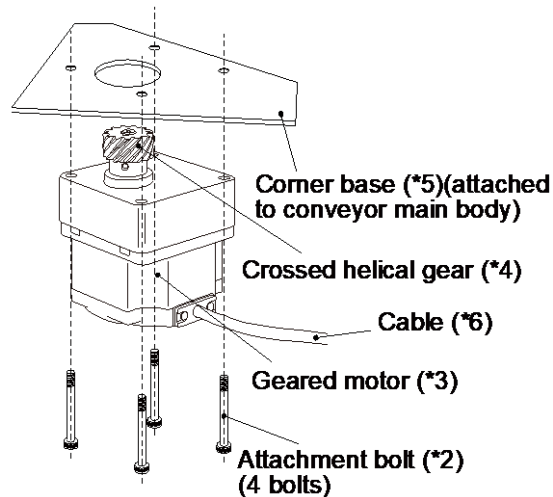


Diagram of installation details



MAGNET REPLACEMENT

7-1. REPLACING MAGNET OF CARRYING ROLLER

1. Remove top cover(*1) and upper bearing holder(*2) attached over carrying roller(*3) with broken /defective magnet(*5). Then remove carrying roller(*3) .

NOTE: For carrying roller removal, see p.16.

2. Pull magnet side bearing(*4) out of carrying roller(*3). Remove collar(*7) adjacent to the removed bearing(*4).

3. Pull broken/defective magnet(*5) out of carrying roller(*3).

NOTE: In advance, remove dirt from broken/defective magnet(*5). When removing the magnet, be careful not to allow it to touch other magnets.

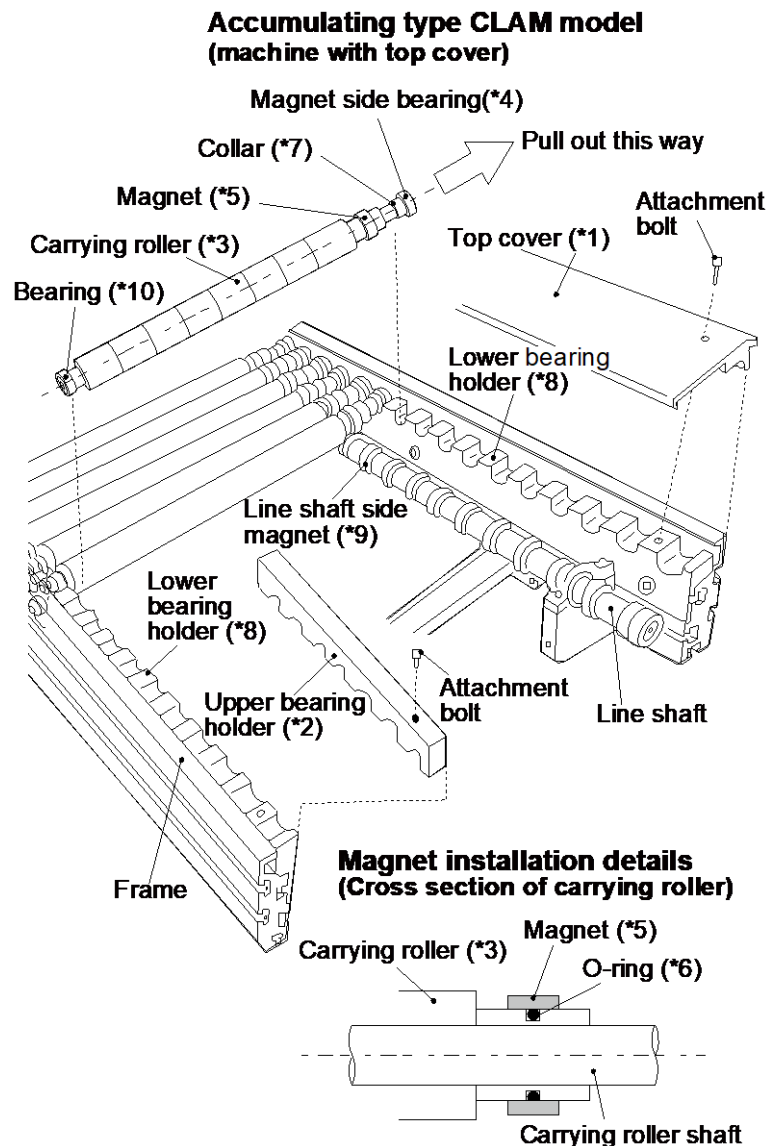
4. Fit center of replacement magnet(*5) to center of O-ring(*6) on carrying roller shaft. If O-ring(*6) is broken/defective, replace it also.

5. Reinstall collar(*7) and bearing(*4) in initial positions. Then set carrying roller(*3) to lower bearing holders(*8).

NOTE: Make sure that there is a minute clearance between carrying roller magnet(*5) and line shaft side magnet(*9). Check each part again if there is any trouble.

6. Make sure that both bearings(*4, *10) are correctly inserted in slots of lower bearing holders(*8). Then reinstall upper bearing holder(*2) and top cover(*1) in initial positions with attachment bolts.

7. Run conveyor to check if carrying roller(*3) rotates correctly. Check each part again if there is any trouble.



7-2. REPLACING MAGNET OF LINE SHAFT

When replacing broken/defective magnet of line shaft, parts which need to be removed (other magnets, shaft end collar, shaft couplings, etc.) depend on position of broken/defective magnet. For proper replacement of magnet, refer to the following procedures.

1. Referring to diagrams on p.20, remove top cover(*1), upper bearing holder(*2) and all the carrying rollers(*3).

NOTE: For carrying roller removal, see p.16.

2. Remove bearing upper covers(*12) and line shaft(*10) from conveyor main body. Then remove shaft coupling(*11) and shaft end collar(*15).

3. Pull broken/defective magnet (*9) out of line shaft(*10). If broken/defective magnet is attached between 2 bearings, replacement will be easier by removing the bearing(*13) closer to broken /defective magnet.

NOTE: When removing magnet, be careful not to allow it to touch other magnets.

4. Position replacement magnet (*9) at the O-ring(*6) of removed broken/defective magnet on line shaft(*10).

NOTE: Fit center of magnet(*9) to center of O-ring(*6). If O-ring is broken/defective, replace it as well.

5. To restore line shaft, correctly reinstall removed parts(magnet, collar, etc.) in initial positions in reverse order. (Do not make any gap between magnet and collar(*16). Incorrect magnet positioning may cause a machine operation malfunction.)

6. Reinstall shaft coupling(*11) and shaft end collar(*15) to line shaft(*10).

7. Reinstall line shaft(*10) to conveyor main body, and reinstall bearing upper covers(*12) to bearing brackets(*14).

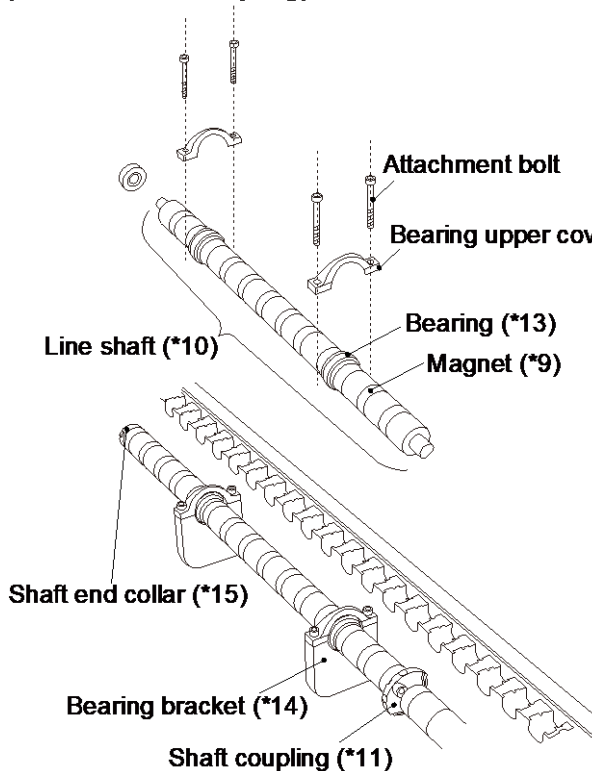
8. Reinstall all the carrying rollers removed in step 1 above in initial positions.

NOTE: Make sure that there is a minute clearance between carrying roller magnet(*5) and line shaft side magnet(*9). Check each part again if there is any trouble.

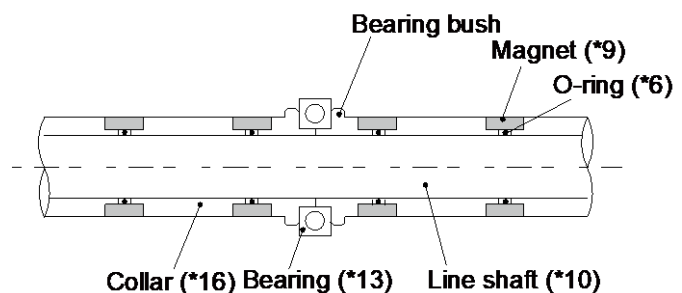
9. Reinstall upper bearing holder(*2) and top cover(*1). (Refer to diagrams on p.20.)

10. Run conveyor to check if carrying roller(*3) rotates correctly. Check each part again if there is any trouble.

After removing top cover and carrying rollers, etc. (line shaft with coupling)



Magnet installation details (Cross section of line shaft)



TAKE-UP AND REPLACEMENT OF TIMING BELT

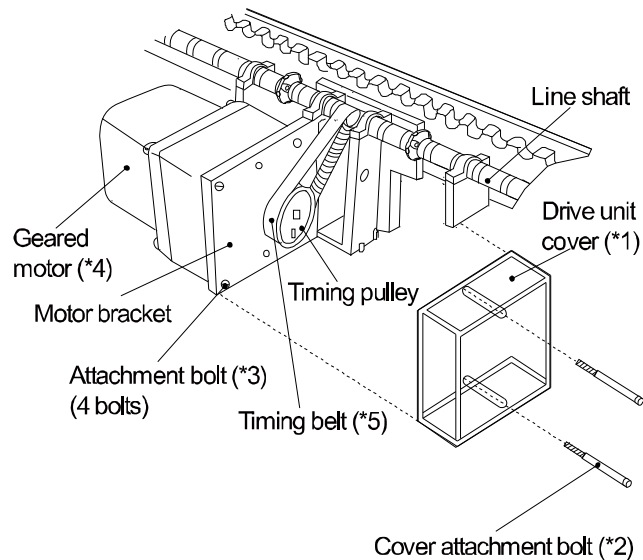
8-1. TAKING UP TIMING BELT

If line shaft does not rotate while motor is running, it is possible that timing belt is slacked off. In this case, take up belt slack as follows:

1. Remove drive unit cover(*1) by loosening cover attachment bolts(*2).
2. To take up timing belt(*5), loosen attachment bolts(*3, 4 bolts) and move geared motor(*4) slightly downward.
3. Properly adjust timing belt tension. Fix geared motor(*4) by tightening attachment bolts(*3, 4 bolts).
4. Reinstall drive unit cover in initial position with cover attachment bolts(*2).
5. Run conveyor to check if line shaft(*6) rotates correctly. Check each part again if there is any trouble.

NOTE: Do not take up timing belt too much. Excessive belt take-up may overload motor or shorten service lives of timing belt and timing pulley.

Timing belt driving type drive unit

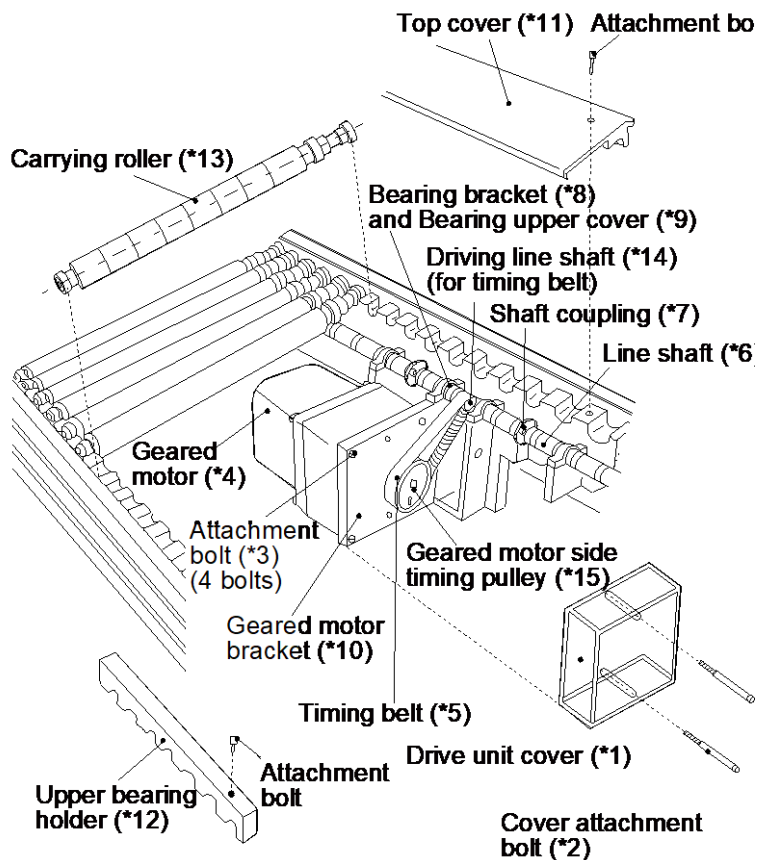


8-2. TIMING BELT REPLACEMENT

Replace timing belt as follows:

1. Remove top cover(*11), upper bearing holder(*12) and all the carrying rollers(*13) near drive unit.
NOTE: For carrying roller removal, see p.16.
2. Remove drive unit cover(*1) by loosening cover attachment bolts(*2).
3. To slacken timing belt(*5), loosen attachment bolts(*3, 4 bolts) and move geared motor(*4) slightly upward.
4. Remove 2 shaft couplings(*7) near timing belt(*5). Driving line shaft(*14) will then be disconnected from line shaft(*6). Remove bearing upper covers(*9) of 2 bearing brackets(*8) supporting driving line shaft(*14). Remove driving line shaft(*14) together with timing belt from geared motor bracket(*10). Then remove timing belt(*5) from driving line shaft(*14).
5. Install replacement timing belt to driving line shaft(*14). Correctly position timing belt(*5), and reinstall bearing upper covers(*9) to bearing brackets(*8). Correctly put timing belt(*5) on driving line shaft(*14) and timing pulley(*15).
6. Reinstall shaft couplings(*7) in initial positions.
7. To take up timing belt, move geared motor(*4) slightly downward. Fix geared motor(*4) by tightening attachment bolts(*3, 4 bolts). Reinstall drive unit cover(*1) with cover attachment bolts(*2).
8. Run conveyor to check if line shaft rotates correctly. Check each part again if there is any trouble.
9. Reinstall carrying rollers(*13) removed in step 1 above.
10. Reinstall upper bearing holder(*12) and top cover(*11).

Intermediate line shaft with couplings on both ends (machine with top cover)



9-1. PROBLEMS AND REMEDIES

PROBLEM	CAUSE	REMEDY
1. Conveyor does not run when switched on.	<ul style="list-style-type: none"> ① Power plug is not properly connected to mains. ② Power switch is not turned on. ③ Inappropriate power source 	<ul style="list-style-type: none"> ① Inspection, correction ② Inspection, correction ③ Check power source. → See p.10.
2. Conveyor is turned on, but motor will not run	<ul style="list-style-type: none"> ① Disconnection or breakage in wiring ② Too slow conveyor speed (variable-speed type) ③ Motor protective circuit or emergency stop switch has been activated. ④ Failure inside motor or control device 	<ul style="list-style-type: none"> ① Check and repair wiring. ② Reset to appropriate speed. → See p.11. ③ Restore protective circuit or emergency stop switch. ④ Inspection and repair or replacement
3. Motor runs, but line shaft does not rotate.	<ul style="list-style-type: none"> ① Line shaft coupling has come off. ② Foreign substance in driving device ③ Overload ④ Wear of gear of geared motor ⑤ Wear of gear (gear driving type machine) ⑥ Timing belt has been loose, broken or come off. (Timing belt driving type) 	<ul style="list-style-type: none"> ① Inspection and correction, repair or replacement ② Inspect, remove foreign substance and clean. ③ Inspect and reduce load. ④ Inspection and repair or replacement ⑤ Inspection and repair or replacement ⑥ Take up belt. Inspection and adjustment, repair or replacement → See p.22 and 23.
4. Line shaft runs, but carrying rollers do not rotate	<ul style="list-style-type: none"> ① Trouble or breakage of magnet of carrying roller or line shaft ② Foreign substance of magnet of carrying roller or line shaft ③ Trouble or breakage of bearing of carrying roller or line shaft 	<ul style="list-style-type: none"> ① Inspection and adjustment, repair or replacement → See p.20 and 21. ② Inspect and remove foreign substance. ③ Inspection and adjustment, repair or replacement
5. Conveyor runs, but speed cannot be changed	<ul style="list-style-type: none"> ① Breakage in wiring of motor and control device ② Failure of speed changing device inside motor or control device 	<ul style="list-style-type: none"> ① Inspection and repair or replacement ② Inspection and repair or replacement
6. Electric shock is received from conveyor	<ul style="list-style-type: none"> ① Static electricity has been charged in frame. ② Electric leakage 	<ul style="list-style-type: none"> ① Grounding → See p.10. ② Inspection, investigation

9-2. ITEMS FOR REGULAR INSPECTION

CHECKING PERIOD	PART TO CHECK	THINGS TO CHECK FOR	CHECKING METHOD	REMEDY
Daily	Carrying rollers	Foreign substances on surfaces	Visual inspection	Remove foreign substances and clean.
		Foreign substances of magnet parts	Visual inspection	Remove foreign substances and clean.
		Rotation malfunction (of accumulating roller parts)	Visual inspection and manual check	Inspection, adjustment
	Line shaft	Foreign substances of magnet parts	Visual inspection	Remove foreign substances and clean.
		Foreign substances of shaft parts	Visual inspection	Remove foreign substances and clean.
	Drive unit	Trouble of gears (gear driving type machine)	Visual inspection	Inspection, adjustment
		Loosening of timing belt (timing belt driving type machine)	Visual inspection	Inspection, adjustment → See p.22.
	Monthly	Carrying rollers	Rotation malfunction (of magnet parts and bearing parts)	Visual inspection and manual check
Line shaft		Rotation malfunction (of magnet parts and bearing parts)	Visual inspection and manual check	Inspection and adjustment, repair or replacement → See p.21.
Drive unit		Trouble of driving transmission parts	Visual inspection	Inspection and adjustment, repair or replacement → See p.18,19,22 and 23.
		Wear of crossed helical gears (single drive type CLAMC model)	Visual inspection	Apply oil to motor side crossed helical gear
Three monthly	Drive unit (geared motor)	Rotation malfunction, loose attachment bolts	Visual inspection and manual check	Inspect and tighten loose attachment bolts
		Overheat and abnormal noise of motor	Manual check and listening	Inspection and adjustment or replacement → See p.18 and 19.
Six monthly	Frame, stands and each attachment part	Overheat and abnormal noise of bearing parts of carrying rollers and line shaft	Visual inspection and manual check	Inspect, adjust and tighten loose attachment bolts.
		Overheat and abnormal noise of bearing parts of carrying rollers and line shaft	Manual check and listening	Inspection and repair or replacement
		Damage of each part	Visual inspection and manual check	Inspection and repair or replacement

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- The specification given in this manual are subject to change without notice.