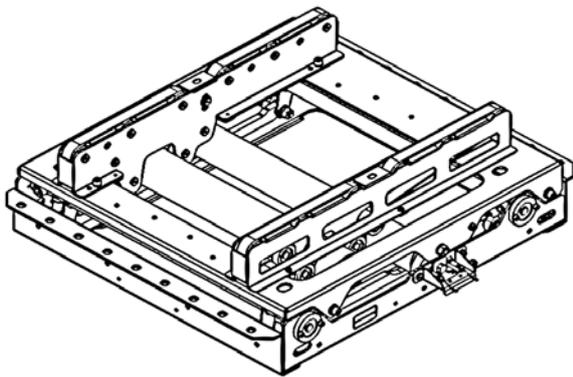


# Instruction Manual

## PDU-90 (Pulse Diverter Unit - 90)

Thank you very much for purchasing PDU-90 product.

- Before operating the unit, please read this manual. These explained here are to help you use the unit safe and correctly, and to prevent danger or injury to the users or other people.
- After reading these instructions, store the manual where it is always accessible by the user.  
Please carefully unpack and inspect your order, taking care not to damage the original packaging.



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# Safety Precautions

**Please strictly comply with the warnings and instructions contained in this manual to prevent the risk of an accident, breakage and/or malfunction of the product.**



## WARNING

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



## CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and could cause property damage.



## WARNING

### [General]

- Do not use the product in an explosive atmosphere, flammable gas atmosphere, corrosive atmosphere, a place exposed to water splashes, or a place close to combustibles. It may cause an electric shock, injury and/or fire.
- All work (e.g., installation, connection, operation, maintenance and failure diagnostics) must be done by a qualified person. Failure to do so may cause a fire, electric shock and/or injury.
- Do not conduct such operations as move, installation, connection, and maintenance while the power is on. Be sure to conduct such operations after turning off the power in order to be safe injury and/or accident.

### [Wiring]

- Be sure to check the specifications of the power supply (direct current), the voltage (DC24V±5%), PULSE ROLLER and Driver card before wiring. Failure to do so may cause a fire, electric shock, injury and breakage.

### [Adjustment / Installation]

- Never touch the power supply when installing PULSE ROLLER or Driver card. It may cause an electric shock and/or injury.

### [Operation]

- Do not touch the internal structure during operation to prevent entanglement and/or clamping accidents.
- Be sure to input instructions such as start/stop, after switching on the power. It may cause an injury and/or accident due to unexpected start-up.
- If Driver card's protection function worked, remove the cause surely prior to release the function. Otherwise, malfunction may occur and it will result in an accident, injury and/of breakage.
- If abnormal noises are being given out from the product, turn off the power switch and cut the power supply immediately to avoid unpredictable accidents.
- Do not use the unit in any way beyond its specifications. It may cause an injury and/or breakage.

# Safety Precautions



## CAUTION

### [General]

- Never store or leave the product outdoors.
- Do not clime and/or overload on the product. It may cause an accident and/or breakage.
- Do not put a heavy load on the product or insert an object into an aperture. It may cause an accident and/or breakage.
- Never modify the main unit of the product and Driver card. It may cause an accident, injury and/or breakage.
- Do not splash the equipment with water. It may cause an electric shock, injury and/or breakage.
- Do not apply strong impact, such as dropping or striking the product. It may cause an accident and/or breakage.
- Take care not to touch the product immediately after operation. It can get very hot and there is a danger that you may get burned and/or injured.
- Wear gloves as many metallic parts are used for the product when touching the products. Failure to do so may cause an injury.
- Do not install the product in a place with large vibration.
- When using in a place with dust or water, surely take measures to keep the product's performance beforehand. The product is not provided with dust-proof and waterproof function.

### [Wiring]

- Do not pull, bend or twist the cord with unnecessary force. There is a danger of a fire or electric shock due to breakage.
- The DC power supply must be earthed. It may cause an electric shock in case of a breakdown or electrical leakage.
- When connecting the control device such as PLC to Driver card, they should share a power supply. If the power supplies are different, install a device like relay between a signal input of a Driver card and the control device so as to transmit signals.

### [Adjustment / Installation]

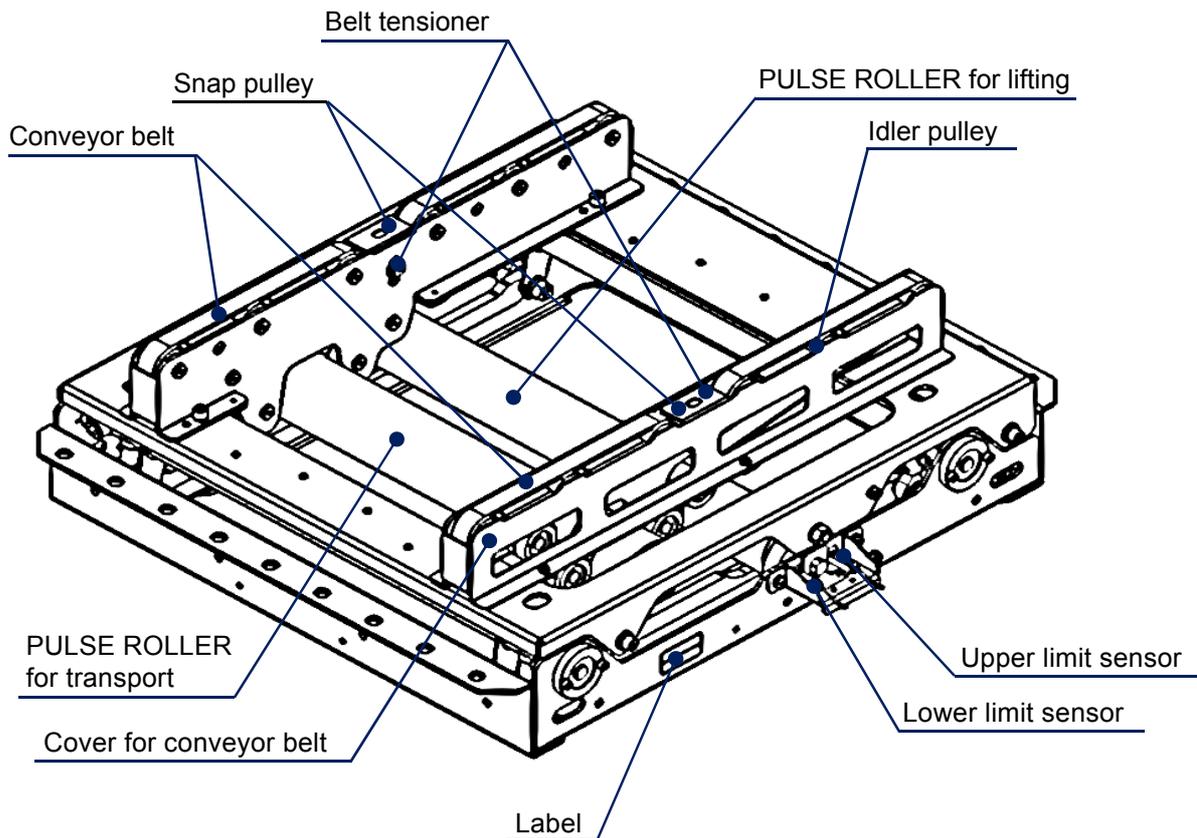
- Install the product horizontally.
- Keep a sufficient working space around the unit for maintenance.
- Install the unit with the screws and tools designated by this manual.
- Always completely follow the necessary safety rules, about a place where the product is installed and the device that uses.

### [Maintenance]

- Replace with a new part immediately if you discovered damage of the product.
- Do not disassemble except for the parts that is specified in this manual.
- There is occasionally need to turn a part and make it go up and down by hand, for maintenance or repair. Be careful not to get your fingers caught in the product.
- Be sure to turn off the power and leave the product for several minutes so as to discharge the electricity in it prior to inspecting or repairing.
- Surely attach the parts such as a cover and screws after maintenance or repair.

## Precautions before Use

### [Names of Parts]



### [Accessory]

- Driver cards are required for the transporting and PULSE ROLLER for transport/lifting, respectively.
- For more information on Driver card, please refer to our separate-volume catalog or contact us.
- Use supplied bolts for the product mounting.
- Install the product with tightening torques according to each strength classification.

### [Power Supply]

- For further information, such as the method for selecting suitable power supply, please refer to our separate-volume catalog or contact us.
- To ensure customer's safety, we suggest using insulated power supply.
- Be sure to use a power supply which has sufficient power capacity and current capacity.

# External Dimensions

**[Main Unit]**

- Please refer to Drawing for Approval for the external dimensions.

**[Accessory and Driver card]**

- Please refer to our separate-volume catalog for the external dimensions.

# Operation

**[Basic Operation]** (See Fig. 1, 2)

- The product is recommended being controlled the following basic flow by a control unit such as PLC.

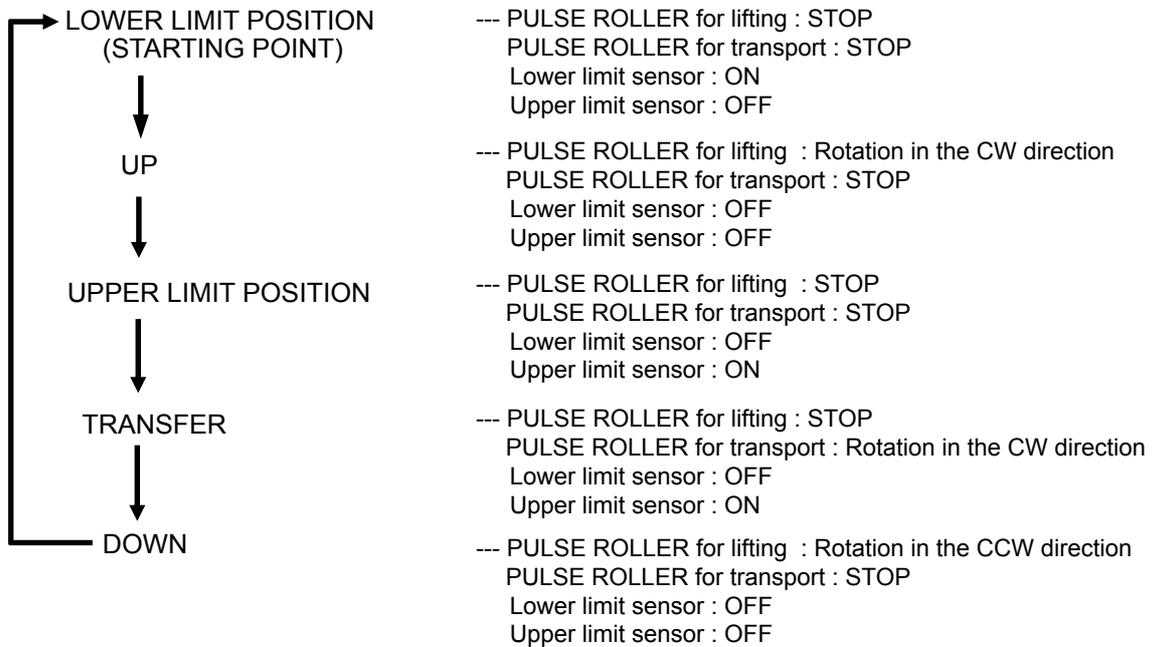
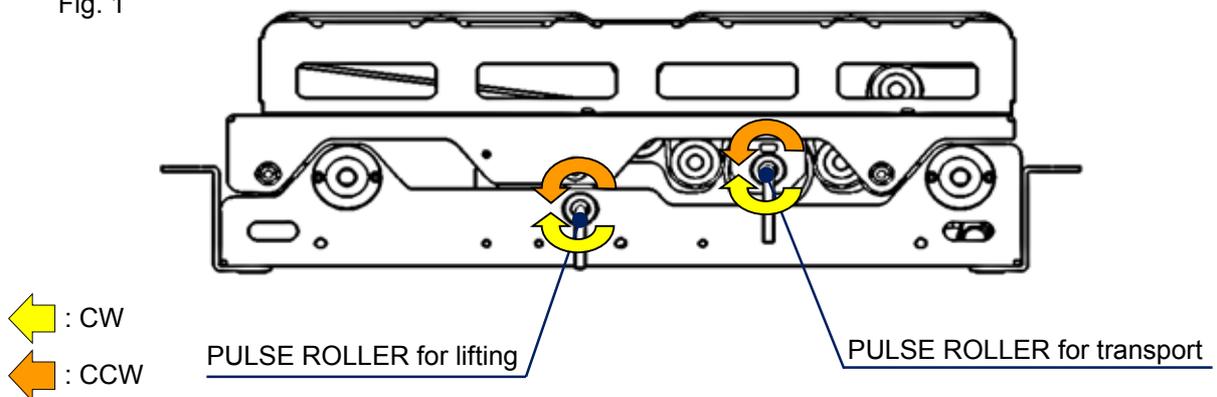
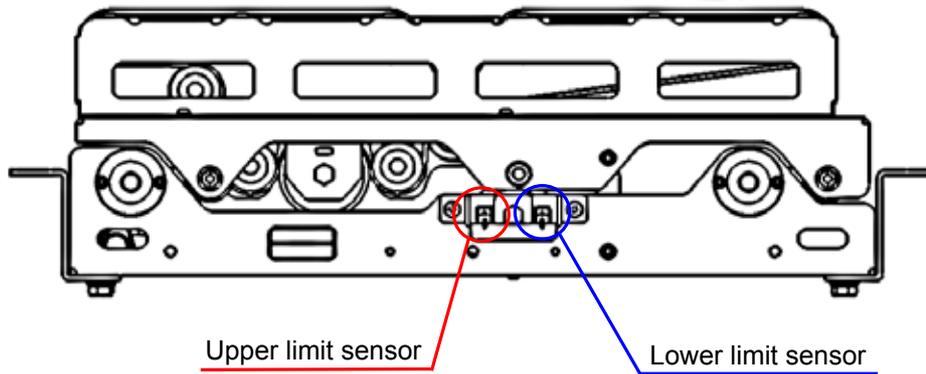


Fig. 1



This rotational direction is viewed from the code side of PULSE ROLLER



[Notes]

- When an overrun occurs during rotation, PULSE ROLLER for lifting will turn around to its original position.  
At the operation resumption, the timing deviation may occur in ascent movement but it will be eliminated in a short time. To prevent the deviation, Basic operation on Page 4 is recommended.
- The product size at the upper limit position and the lower limit position might be different from the size in this manual for reasons of the setting situation or control method.

## Setting

[How to set]

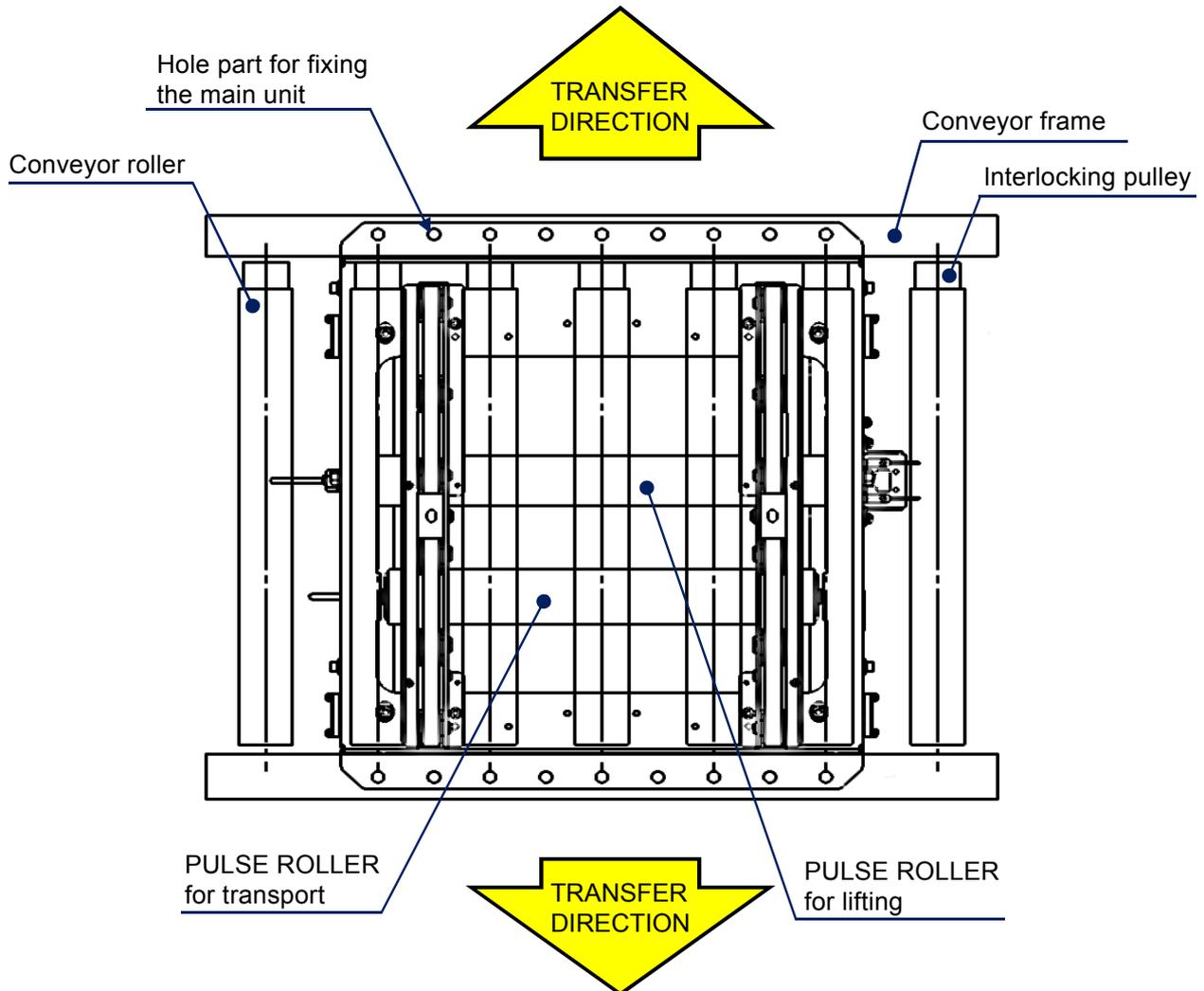
●Installation instructions

1. Put in the main unit from the under conveyor frames, then securely fasten it to the mounting hole with supplied screws while supporting.  
At this time, align the orientation of the pulley position and the direction of the main unit as instructed by the drawing. In some cases, the main unit, conveyor, and interlocking roller belt are possible to interfere one another.
2. Connect the PULSE ROLLERS for lifting/transport with Driver cards in which the programs were already set.  
Make sure that the cards are connected correctly. Failure to do so may lead to malfunction.
3. Connect the upper/lower limit sensors and Driver cards to the power supply and a PLC.
4. After installation, perform a test-run without loading to check whether it operates correctly.

●Wiring method

Please refer to our separate-volume catalog for the details of the power supply method to the Driver cards or the connection method to a PLC.

Fig. 3



[Notes]

- Before installing the product make sure that a breaker of the appropriate capacity is installed.
- Before installing the power supply make sure the breaker and an emergency stop switch work correctly.
- The installation of the power supply should be done in the predetermined method.
- When installing the product, be careful not to get things (e.g., cable) caught.
- When installing or performing a test run, be careful not to get your fingers and clothes caught in the conveyor belt.
- Fasten the product firmly to the predetermined mounting holes.

# Maintenance

[How to Replace a Belt] (See Fig. 4,5)

1. Fasten the Lift table at the lower limit position.
2. Loosen a Tensioner of a conveyor belt unit.
3. Remove Fixing bolts of the conveyor belt unit.
4. Loosen Fixing bolts of a conveyor belt cover, and remove the cover.
5. Remove attached the belt and replace with a new one.  
Belt does not have specified direction to attach, but be careful not to place upside down.
6. Set the belt at the predetermined position, then attach the conveyor belt cover.  
Setting the belt in incorrect position might cause a breakage of the main unit.  
(Recommended tightening torque for M4 screw: 1.48 Nm)
7. Attach the conveyor belt unit on the main unit.  
(Be careful not to slacken the belt.)  
(Recommended tightening torque for M6 screw: 10.8 Nm)
8. Adjust the belt tension by the tensioner.  
(Recommended tightening torque for M6 screw: 5.2 Nm)
9. Verify that all the bolts, nuts, and belt are securely tightened and operate test-run to check there is no abnormality.

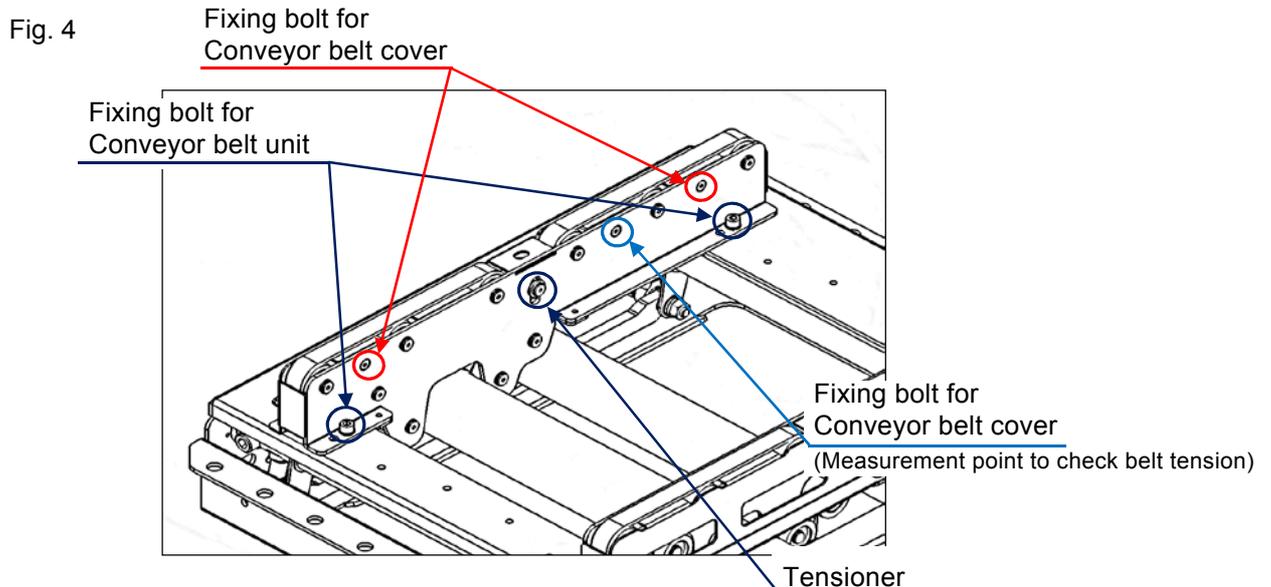
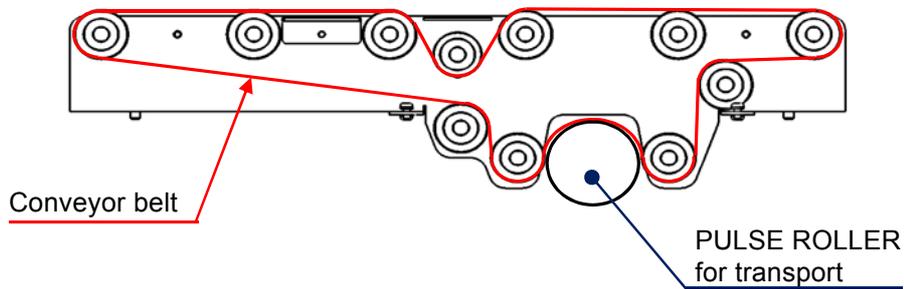


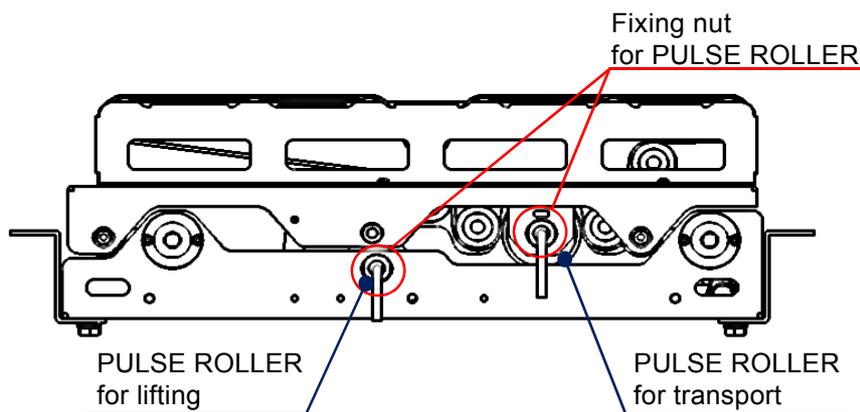
Fig. 5



[How to Replace a PULSE ROLLER for transport] (See Fig. 6)

1. Follow the belt replacement procedures 1-3, then remove a conveyor belt unit.
2. Remove Fixing nuts for the PULSE ROLLER from the side of the main unit.
3. Push the Non-cable side shaft of the roller and pull out the roller.
4. Replace with a new one. Be careful not to pinch and damage the cable at this time.
5. Assemble the main unit in the reverse order to the belt replacement procedures 1-3.  
(Recommended tightening torque for PULSE ROLLER fixing nut: 34.1 Nm)  
(Recommended tightening torque for M6 screw: 10.8 Nm)
6. Verify that all the bolts, nuts, and belt are securely tightened and operate test-run to check there is no abnormality.

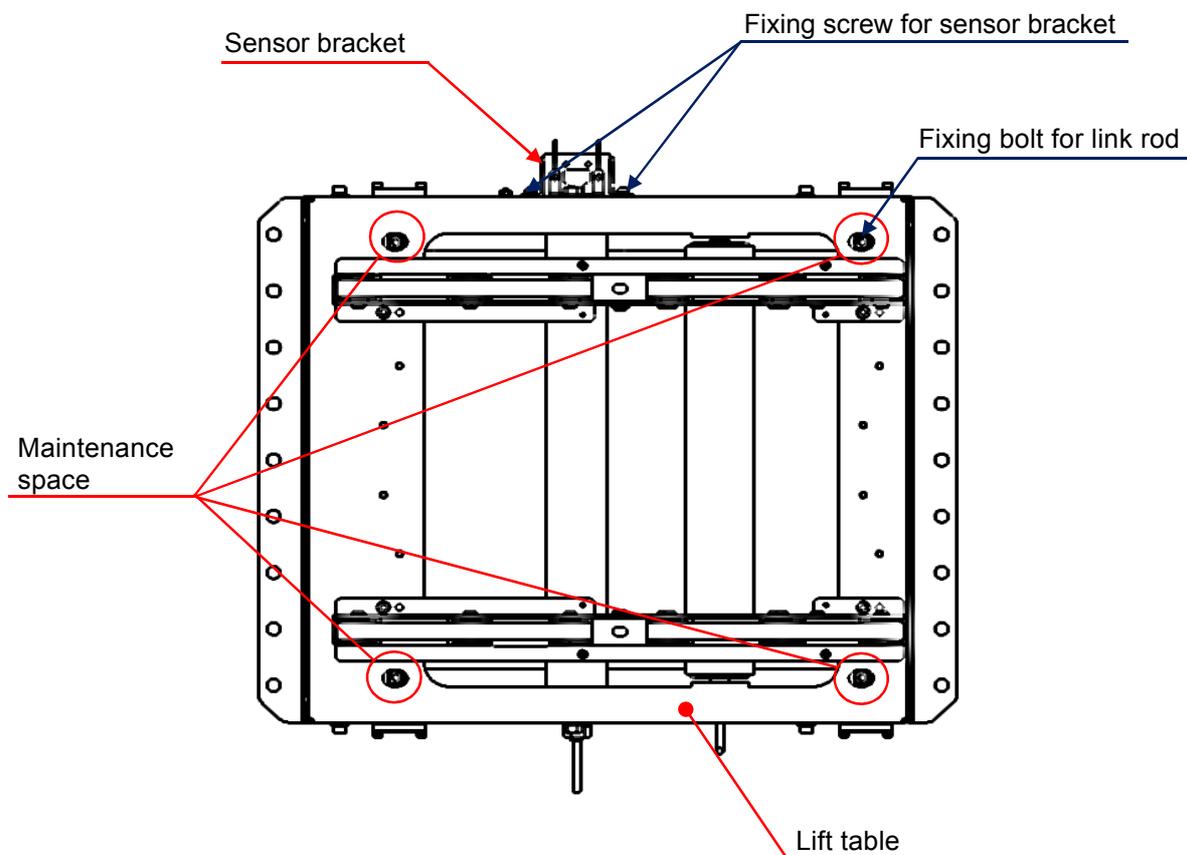
Fig. 6



[How to Replace a PULSE ROLLER for lifting] (See Fig. 7)

1. Remove Fixing nuts for the PULSE ROLLER from the side of the main unit.
2. Insert a tool from a Maintenance space of the Lift table, and remove Fixing bolts for link rod.
3. Loosen a Fixing screw for sensor bracket on the side of the main unit, then remove the bracket.
4. Fasten the Lift table at the upper limit position and replace the PULSE ROLLER with a new one.
5. Assemble the main unit in the reverse order to the procedures 1-3.  
(Recommended tightening torque for PULSE ROLLER Fixing nut: 34.1 Nm)  
(Recommended tightening torque for M8 screw: 24.9 Nm)  
(Recommended tightening torque for M6 screw: 10.8 Nm)  
(Recommended tightening torque for M5 screw: 2.3 Nm)
6. Verify that all the bolts, nuts, and belt are securely tightened and operate test-run to check there is no abnormality.

Fig. 7



# Specifications

[Main Unit]

Size	Overall width	Please refer to your Drawing for Approval.	
	Overall length		
	Overall height		
Conveyor speed			
Lifting stroke			
Weight			
Voltage			DC24V
Operating ambient temperature			0~40 °C (No freezing)
Operating ambient humidity			Less than or equal to 90 %RH (No condensation)
Installation site			Indoors

\*For details on PULSE ROLLER and Driver card, please refer to our separate-volume catalogs.

[Parts List for Maintenance]

- Conveyor belt --- L-350 W15 × L□□□□ × T1.4 (Made by NITTA Corporation)
- Ascent/descent detection sensor --- APM-B3A1 (Made by Azbil Corporation)
- PULSE ROLLER for lifting --- PR-HD-48-□□□□-□ASAY 1 piece
- PULSE ROLLER for transport --- PR-HD-48-□□□□-□WSAA 1 piece
- Driver card --- Depends on your request

- When disposing of the product, entrust the work to an industrial waste disposal contractor after the consignment contract.

■Warranty

- The warranty period is 2(two) years from delivery of the product under proper installation and handling. The warranty covers only the repair of the main body of the delivered product.

■Contact information for Technical support



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The specifications of the products are subject to change for improvement without prior notice.