

TSUBAKI CABLEVEYOR (Cable Carriers)

Guide Channel Fabrication and Installation Manual for Gliding Arrangement

Caution: Wear suitable protective equipment for the work (such as safety goggles, gloves, and safety shoes).

■ Installation layout of cable carrier with gliding arrangement and guide channel

The gliding arrangement is designed to slide a cable carrier on a guide channel when travel length exceeding the unsupported length with support rollers in 2 locations shown in the load diagram is required.

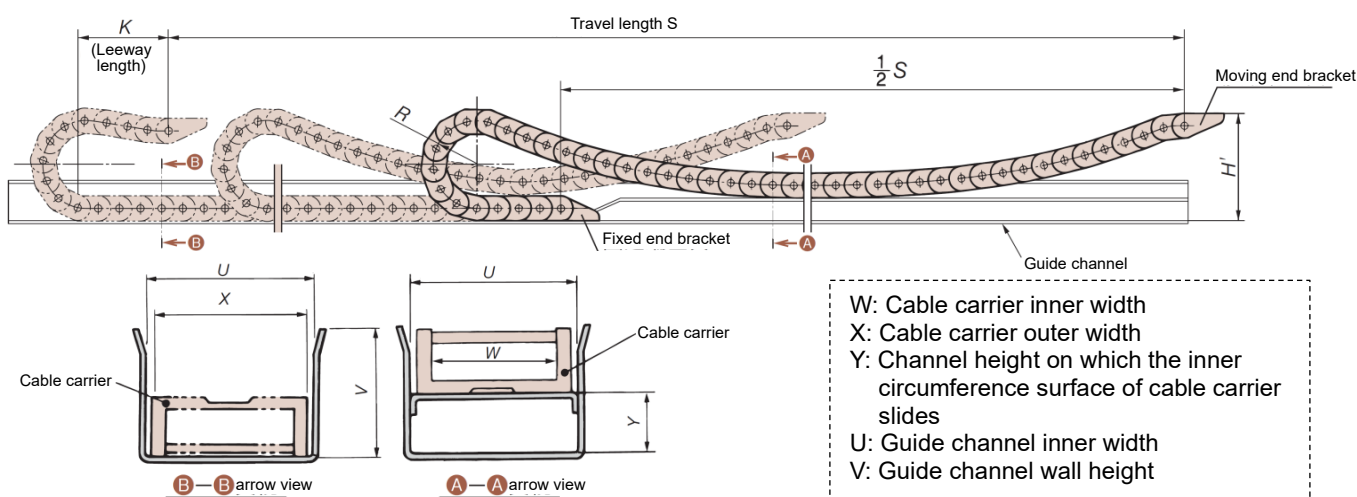


Fig. 1 Guide channel cross section

■ Guide channel material

Guide channels restrict the lateral deviation with respect to the moving direction of cable carriers, so fabricate them from smooth steel sheet to reduce wear on the surface. **Galvanized steel sheet or SUS304 is recommended as the material when fabricating channels.**

Use SUS304 when the channels will be used in an outdoor environment.

[Cautions]

- If the **channels are painted** for rust-proofing, the paint may peel off due to the sliding motion of the cable carrier, which can **accelerate wear on cable carriers**.
- Do not use Tsubaki's guide channels (made of aluminum) for gliding arrangement in outdoor environments.

■ Precautions for fabricating guide channels

(1) Guide channel shape

For cable carriers with gliding arrangement, it is necessary to install two types of channels (*1) with different cross-sectional shapes as shown in Fig. 1.

*1 Channels with the cross-sectional shape in the A-A arrow view in Fig. 1 are called H channels. Channels with the cross-sectional shape in the B-B arrow view are called U channels.

(2) Channel installation precision

Lateral deviation should be within 3 mm per 5 m either to the left or right (Fig. 2). Install the channel in such a way that it will not deviate entirely in one direction.

Vertical deviation should be within 5 mm per 5 m either upward or downward. Install the channel in such a way that it will not tilt entirely in one direction.

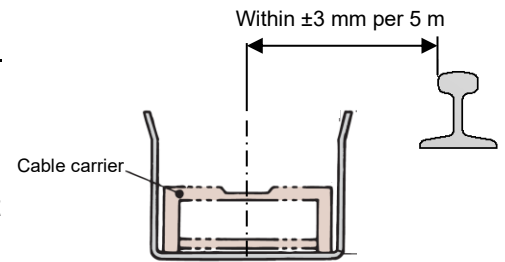


Fig. 2 Lateral deviation in channel

(3) Taper angle of channel opening

Give an outward slope to the opening at the top of the channel so that the cable carrier can be smoothly inserted into the channel.

➔ **Recommendation: Bending angle of 15° to 20° and length of 30 mm or more** (Fig. 3)

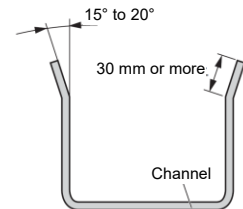


Fig. 3 Channel opening shape

(4) Channel joints

* Sidewall surface

Bend the ends of channel sidewalls at joints outward so that the cable carrier will not jam.

* U channel

Adjust the bottom surface height so that the difference in level between two bottom surfaces can be kept within 1 mm (Fig. 4).

Chamfering of the joint end face and other machining is not required. However, ensure the surface is smooth and without burrs, flakes, or waves.

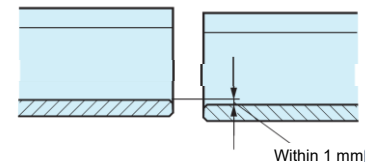


Fig. 4 Difference at the bottom surface level of joint between U channels

* H channel

For the platform the cable carrier slides on, fit the channels tightly so there is no unevenness at joints.

If there is a gap at a joint, keep it within 5 mm and chamfer the ends (approximately C2) to eliminate any difference in surface level (Fig. 5).

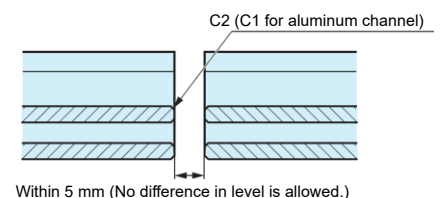


Fig. 5 Joint between H channels

(5) Structure of the fixed end bracket for the cable carrier and the transfer section of the channel

In order to allow the upper run of the cable carrier to travel (transfer) smoothly between the fixed end of the cable carrier and the H channel platform, shape the end of the H channel platform as shown below before installing the channel.

• For cable carriers with no gliding shoes attached

(* Fixed end bracket: FOA, FO)

Give a slope of approximately 10° to the end of platform with a length of 30 mm and install the channel in such a way that the platform will touch the fixed end bracket (Fig. 6).

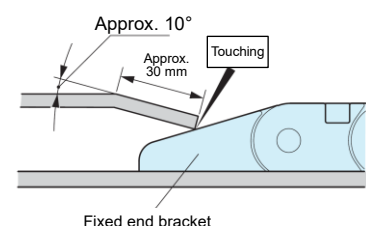


Fig. 6 Channel shape at fixed end

- **For cable carriers with gliding shoes attached**

(*Fixed end bracket: FOAGA)

First determine the channel vertical position so that the top surface of the platform will become flush with the flat surface of gliding shoe at the fixed end of the cable carrier. Round the end of the platform (R2 to R3) and install the channel so that the end face will come into contact with the gliding shoe (Fig. 7).

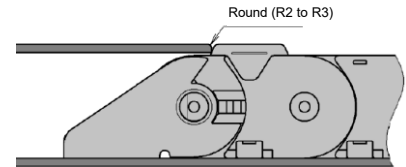


Fig. 7 Channel shape at fixed end

- **For cable carriers with no gliding shoes attached**

(* Fixed end bracket: FU)

First determine the channel vertical position so that the top surface of the platform will become flush with the top surface (inner circumference surface) of the FU bracket. Round the end of the platform (R2 to R3) and install the channel so that the end face will come into contact with the FU's tip end face (Fig. 8).

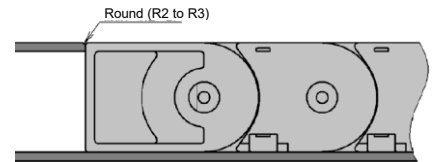


Fig. 8 Channel shape at fixed end

- **For cable carriers with gliding shoes attached**

(* Fixed end bracket: FUGA, FUCRGA)

First determine the channel vertical position so that the top surface of the platform will become flush with the flat surface of gliding shoe at the fixed end of the cable carrier. Round the end of the platform (R2 to R3) and install the channel so that the platform end face will come into contact with the gliding shoe (Fig. 9).

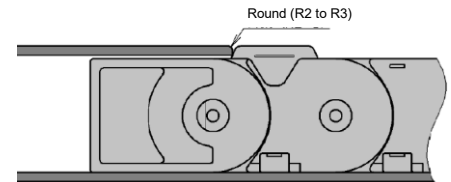
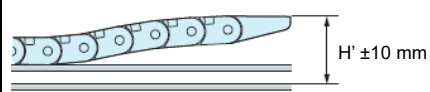
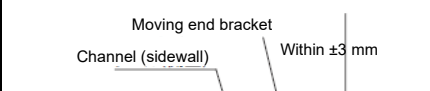
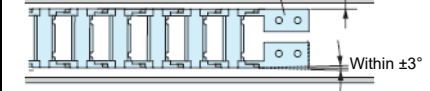
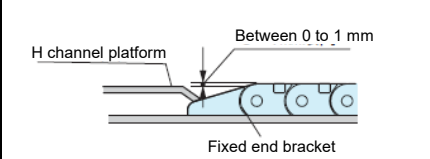
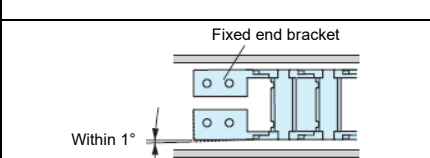


Fig. 9 Channel shape at fixed end

■ Installation of cable carrier

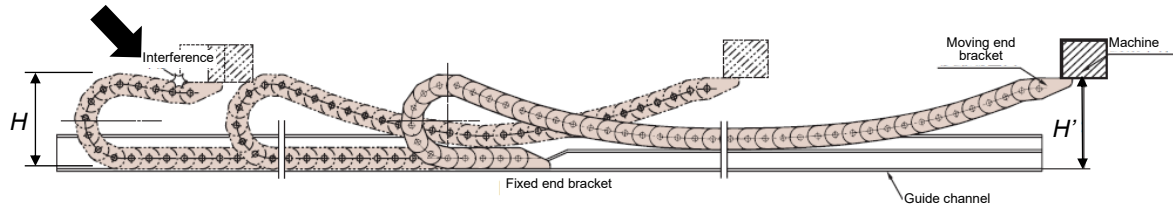
Attach the moving end bracket to the moving side of machines or equipment and the fixed end bracket to the fixed side.

* Installation precision at both ends

Side	Item	Precision	
Moving end side	Installation height	<u>Within ± 10 mm</u> across the entire channel	
	Lateral deviation (in the moving direction)	<u>Within ± 3 mm</u> across the entire channel sidewalls	
	Parallelism	<u>Within $\pm 3^\circ$</u> across the entire channel sidewalls	
Fixed end side	Installation height	Top surface of fixed end bracket should be kept <u>between 0 to 1 mm</u> in relation to the top surface of the H channel platform.	
	Parallelism	<u>Within 1°</u> in relation to the channel sidewalls	

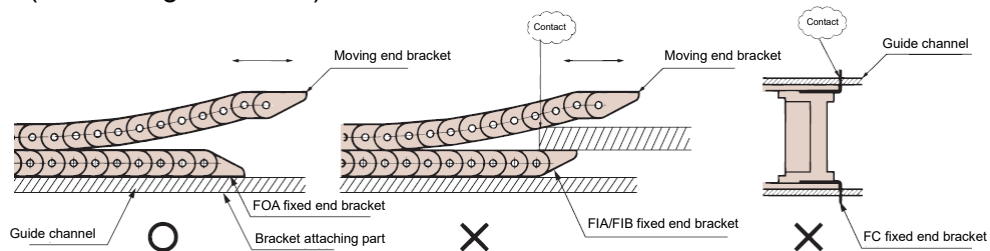
[Cautions]

- With the gliding arrangement, the installation height (catalog dimension H') should be lower than the total height of bend (catalog dimension H). (In the figure below, $H' < H$.) Use the moving end bracket specifically for the gliding arrangement that can be bent in both directions (*2). If the moving end bracket is attached to the fixed end and the fixed end bracket to the moving end, it may cause malfunction of the cable carrier and result in damage to it.
*2 This may not be applicable depending on the cable carrier model and bending radius R . (Refer to the catalogs.)
- Be careful not to allow the moving parts of machines or equipment to interfere with the cable carrier (point indicated with an arrow in the figure below).



- For the fixed end bracket, use one of the following models: FOA, FO, FU, FOAGA, FUGA, or FUCRGA.

Do not use any fixed end bracket other than the above models. If other brackets are used, the mounting area of machines or equipment will come into contact with the upper run of the cable carrier. Also, the FC cannot be used because it comes into contact with the guide channel. (See the figure below.)



■ Installation of cables/hoses

The cable carrier becomes longer than the basic length when tension is generated due to the clearance between the connected links (between pins and holes) (*3). Prepare the cables/hoses to be housed in the cable carrier with a certain amount of leeway and adjust their lengths in the actual cable carrier.

*3 The amount of stretching is approximately 0.2 to 0.6% of the total length at maximum.

(1) Fix (clamp) cables/hoses at the moving end of the cable carrier.

Move the moving end to the position where the upper run becomes shortest and clamp the cables/hoses at the moving end of the cable carrier.

(2) Adjust the lengths of cables/hoses in the cable carrier.

Move the moving end to the position where the upper run of the cable carrier becomes longest, and adjust the lengths of cables/hoses so that they will not be pressed against the inner or outer surface in the cable carrier bend. When adjusting the lengths, arrange them loosely (with enough space to allow them to “float” above the inner circumference surface of the bend of cable carrier) in order to ensure their free movement without twisting (Fig. 10).

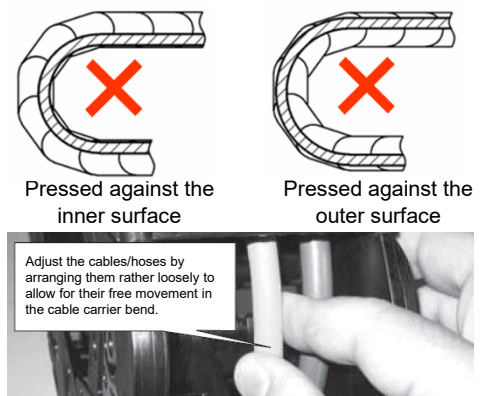


Fig. 10 Checking tension of cables/hoses in the bend

(3) Clamp the cables/hoses at the fixed end of cable carrier.

Recheck that the cables/hoses are not tensioned and then clamp them at the fixed end of the cable carrier.

[Cautions]

- Lay out the cables/hoses in the cable carrier in a way that prevents them from twisting and meandering. Do not pull out the cables/hoses from a drum or coil in spirals (Fig. 11).
- Make sure the cables/hoses are straight when inserted into the cable carrier (Fig. 12).
- Do not fix the cables/hoses inside the cable carrier.

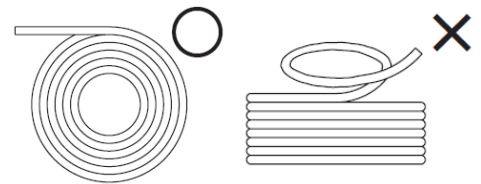


Fig. 11 Pulling out cables/hoses

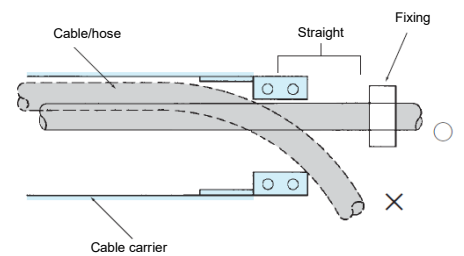


Fig. 12 Cable/hose installation status at both cable carrier ends

■ Post-installation check

Before performing a test run, check the following points. After checking, perform a test run by operating the cable carrier at low speed, and if there is no problem, perform a test run at a normal operation speed. If there is no problem during the normal speed test, installation is completed.

- The moving end and fixed end brackets are fixed correctly.
- The straightness of the guide channel is secured and it does not bend to one side.
- The cable carrier has sufficient leeway length and is free from excessive tension at the position where the upper run becomes longest and shortest.
- All guide channels are properly and securely bolted.
- There is no difference in level at joints between guide channels.
- The cable carrier travels (transfers) smoothly between its fixed end and the H channel platform.
- There are no foreign objects (e.g. tools left behind) on the outer surface of or inside the cable carrier, and also on the channels on which the cable carrier travels.
- The cables/hoses are fixed (clamped) at the moving and fixed ends of the cable carrier.

■ Maintenance check

After starting normal operation, check the following points regularly. (Inspection frequency: Once every 3 months)

- The cable carrier travels back and forth smoothly.
 - When the upper run travels between the fixed end of the cable carrier and the H channel platform, it does not jump up due to a difference in level or a jam.
 - When viewed from the direction of travel, the cable carrier is not inclined.
- The stay (openable lid on the outer circumference side) and lock stay (openable lid on the inner circumference side) of the cable carrier are not left open or detached.
- No fastening bolts in the following locations are loose.
 - On guide channels
 - Moving and fixed end bracket areas of the cable carrier
- Cables/hoses in the cable carrier
 - Do not twist or meander.
 - Not forcibly pulled.
- Clamps on the cables/hoses at the moving and fixed ends are not loose.
- There is no dust or wear debris that has accumulated on the guide channels (especially at the fixed end of the cable carrier).

■ Reference: Examples of problems due to poorly fabricated channels

* Difference in level at the joints of sidewalls

The uneven part interferes with the cable carrier bend. This causes damage to the cable carrier and wear due to buckling and sliding.

* Difference in level at the bottoms of channel joints

Any difference in level between H channels may cause unusual wear on the inner circumference surface of the cable carrier. Buckling and localized wear will also occur in the cable carrier if there is a large difference in level between U channels.

* The H channel platform is higher than the top surface of the fixed end bracket.

When the cable carrier travels between the fixed end of the cable carrier and the H channel platform in the direction in which the upper run becomes longer, the cable carrier slides over the H channel platform. This may cause noise and unusual wear on the inner circumference surface of the cable carrier and the channels.

* Channels are not installed level.

Buckling and increased sliding resistance may occur.

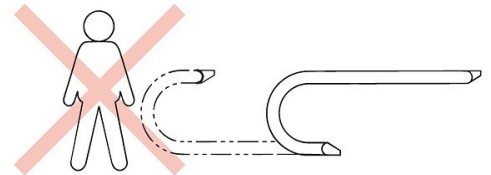
If you have any problems or questions, please contact a Tsubaki representative.

For Safe Use



WARNING Observe the following points in order to prevent hazardous situations.

- Do not use the cable carrier and its accessories (including Cleanveyor and Flatveyor) for anything other than their original purpose.
- Do not stand or ride on the cable carrier. There is a risk of damage and falls.
- Never perform additional work on the cable carrier or the accessories (except fitting connectors on Cleanveyor or Flatveyor).
 - Do not clean the cable carrier or the accessories with acids or alkalis, as they may cause cracking.
 - Never electroplate the cable carrier or the accessories, as this may cause cracking due to hydrogen embrittlement.
 - Do not weld the cable carrier or the accessories, as the heat may cause cracking or a reduction in strength.
- Observe all appropriate labor safety codes and standards for your region or area.
- When there is a need to replace a damaged (fractured) portion of a cable carrier or an accessory, always replace the whole cable carrier or the accessory with a new product rather than replacing only the damaged or fractured portion.
- Immediately stop using the cable carrier or the accessories if they come into contact with a substance that can cause embrittlement cracking (acid, strong alkali, battery fluid, etc.) and replace with a new cable carrier or accessory.
- Observe the following when connecting, installing, removing, servicing, and inspecting the cable carrier or the accessories.
 - Perform the procedure as specified in the instruction manual, catalog, or documentation specially provided to the customer.
 - Secure the cable carrier and the accessories so they do not move freely. The cable carrier may move on its own or collapse under its own weight.
 - Be careful not to pinch, crush, or entangle hands in the bending section of the cable carrier.
 - Wear suitable clothing and protective equipment for the work (such as safety goggles, gloves and safety shoes).
 - Always turn off the source power supply beforehand, and take care not to accidentally operate switches.
 - Only experienced personnel should handle the cable carrier.



CAUTION Observe the following points to prevent accidents

- Carefully understand the construction and specifications of the cable carrier or the accessories before handling.
- Inspect the cable carrier or the accessories for damage during transport before installation.
- The cable carrier or the accessories should be periodically serviced and inspected.
- Cable carrier capacity varies according to manufacturer. When selecting a chain based on a Tsubaki catalog always use the corresponding Tsubaki product.
- Always ensure that the final customer receives the instruction manual.
 - If you do not have the instruction manual, contact a Tsubaki representative with the product name, series name, and chain/model number to receive the appropriate manual.
- The product information given in this catalog is mainly for selection purposes. Thoroughly read the instruction manual before actually using the product, and use it properly.