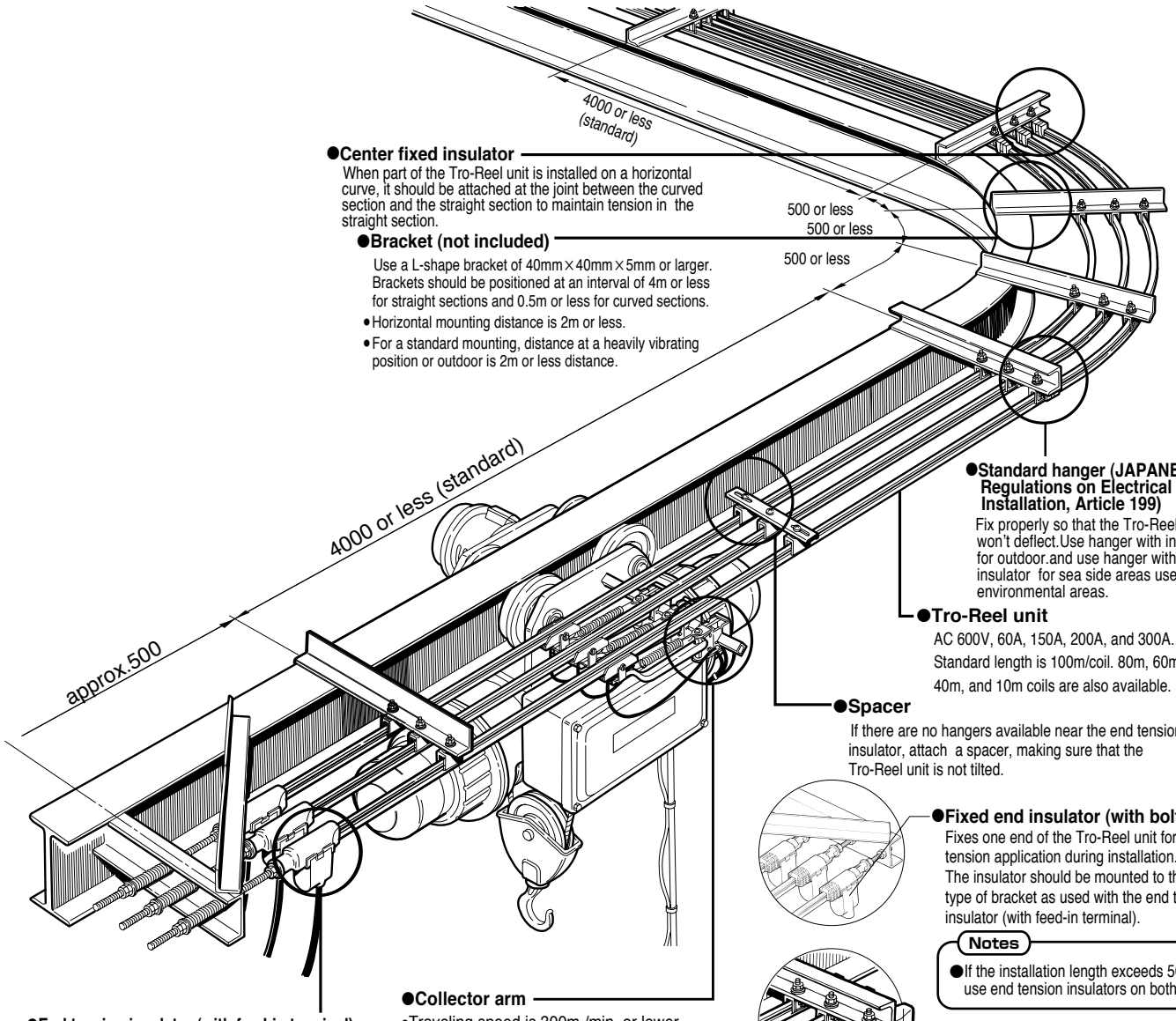
Installation Procedures for Tro-Reel



●Center fixed insulator

When part of the Tro-Reel unit is installed on a horizontal curve, it should be attached at the joint between the curved section and the straight section to maintain tension in the straight section.

●Bracket (not included)

Use a L-shape bracket of 40mm×40mm×5mm or larger. Brackets should be positioned at an interval of 4m or less for straight sections and 0.5m or less for curved sections.

- Horizontal mounting distance is 2m or less.
- For a standard mounting, distance at a heavily vibrating position or outdoor is 2m or less distance.

●Standard hanger (JAPANESE Regulations on Electrical Installation, Article 199)

Fix properly so that the Tro-Reel unit won't deflect.Use hanger with insulators for outdoor.and use hanger with porcelain insulator for sea side areas use or bad environmental areas.

●Tro-Reel unit

AC 600V, 60A, 150A, 200A, and 300A.
Standard length is 100m/coil. 80m, 60m, 40m, and 10m coils are also available.

●Spacer

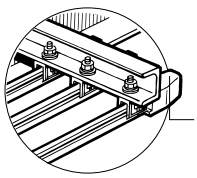
If there are no hangers available near the end tension insulator, attach a spacer, making sure that the Tro-Reel unit is not tilted.

●Fixed end insulator (with bolt)

Fixes one end of the Tro-Reel unit for easy tension application during installation.
The insulator should be mounted to the same type of bracket as used with the end tension insulator (with feed-in terminal).

Notes

- If the installation length exceeds 50m, use end tension insulators on both ends.



●Fixed end insulator

Fixes one end of the Tro-Reel unit for easy tension application during installation.
Drill a hole in the end of the Tro-Reel unit and put a pin through the hole.

Notes

- If the installation length exceeds 50m, use end tension insulators at both ends.
- When a hanger with the porcelain insulator is used,use fix end insulators(with bolt).

●End tension insulator (with feed-in terminal)

Applies tension to the Tro-Reel unit to absorb sag or expansion and contraction due to temperature fluctuation.
It supplies a power supply from here.

●Collector arm

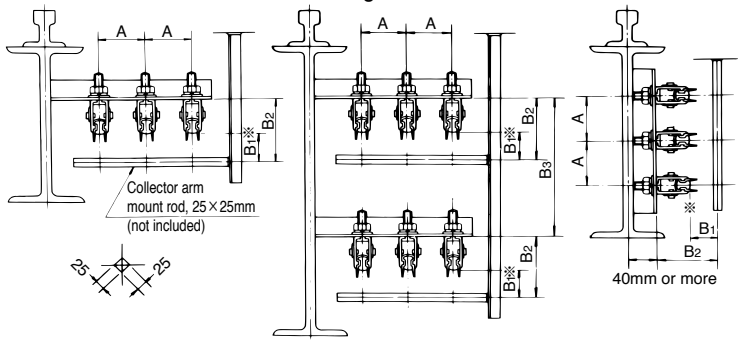
- Traveling speed is 300m /min. or lower.
- For a tandem configuration,easily assemble it at the job site if you use two collector arms.
- If you use on a horizontal run way, set a Collector arm support parts(for transverse). (Collector arm mount rod (25×25mm) is not included.)

Unit:mm

Standard Installation Procedures for Tro-Reel

The following drawing shows the dimensions for mounting I-beams and other building structures, support brackets(not included) and Tro-Reel unit to I-beams and other building structure.

●Standard installation ●Two-stage installation ●Horizontal installation



The asterisk (※) indicates the conductor sliding surface.

Installation size

(mm)

Hanger types \ Size	A size		B size		
	Minimum	Standard	B_1	B_2	B_3
Standard hanger	75	100	95	135	295
Hanger with insulator				160	320

Note:The B_3 size is applied for a L-shape bracket of 40mm×40mm×5mm.

Installation Procedures for Tro-Reel unit and hanger supporting distance

■Tro-Reel unit mounting method and hanger intervals.

Hanger intervals	Standard installation	4m or less
		When installedoutdoors or in a place exposed toheavy vibration such as for horizontalwiring in cranes: } 2m or less
	Horizontal installation	2m or less

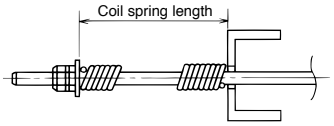
⚠Caution

Do not step on or bang the Tro-Reel unit on the ground to straighten.

The insulating sheath of Tro-Reel unit is made of rigid PVC, which becomes fragile and stiffen under low temperatures. As this may damage the unit. Use a straightener to straighten the coils before installation. Failure to do so may cause poor collector arm contact or separation from wires.

Critical six points on installation

1 Sufficient tension must be applied to the end tension insulator.



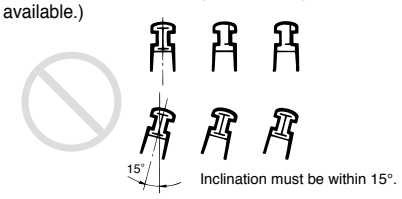
● Ambient temperature during installation and coil spring tightening length

Ambient temperature	Coil spring length
10℃ or lower	115mm
11-40℃	125mm

If tension is not sufficient, the collector arm may be derailed or fallen.

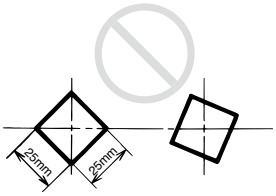
2 Avoid tilting or twisting in the Tro-Reel unit.

If the Tro-Reel unit is tilted, the collector arm will separate from the wires.
Be sure to correct any tilting found during installation. (A spacer to prevent tilting and twisting is also available.)



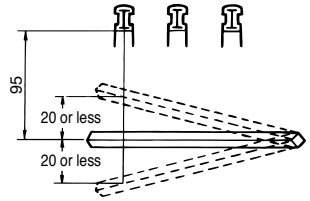
Inclination must be within 15°.

3 The collector arm mount rod must be properly mounted without any twisting.

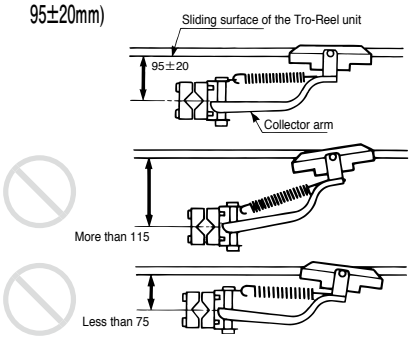


4 Be sure to check for tilt in the collector arm mount rod.

Be sure that arm swing is within 20mm, even during travel.

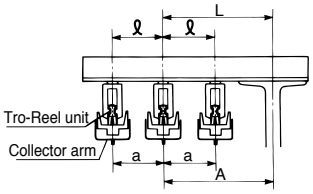


5 Set the distance between the collector arm mount rod and the sliding surface of the Tro-Reel unit to 95mm.(Central value of the collector arm permitted movable range 95±20mm)



6 The Tro-Reel unit must be aligned with the center of the collector arm.

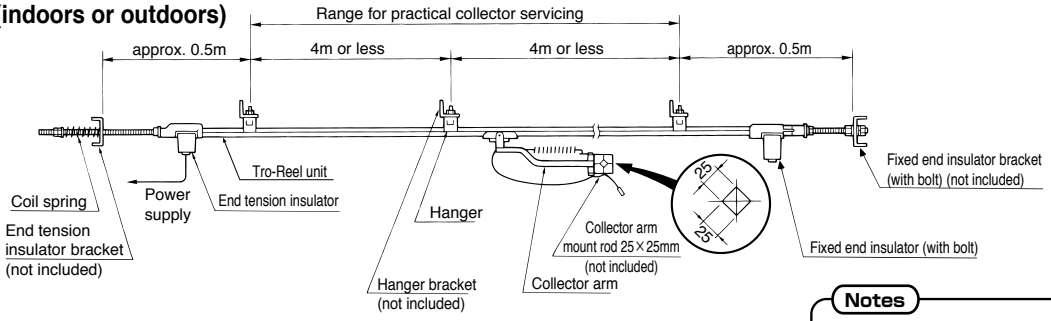
Set the length of "L" and "A"as well as "ℓ" and "a" to the same length.



Components for straight section installation

■ Line length less than 50m(Use an end tension insulator on only one end.)

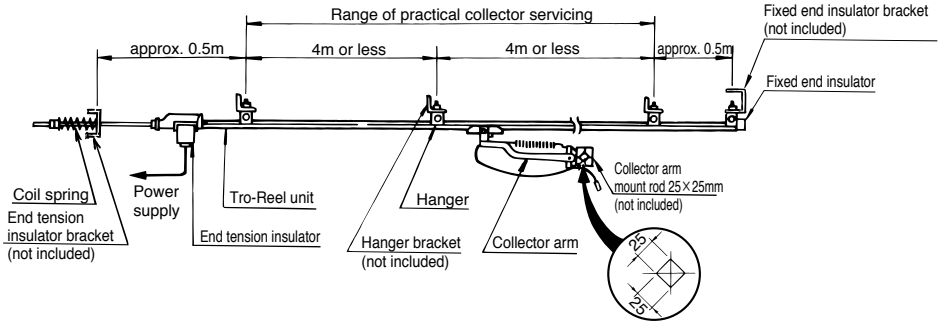
● **Both area (indoors or outdoors)**



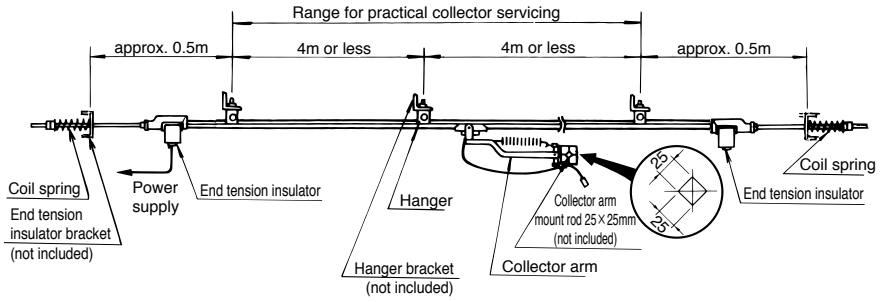
Notes

●**When using the Tro-Reel unit outdoors, use end tension insulators (with bolt) on both ends.**

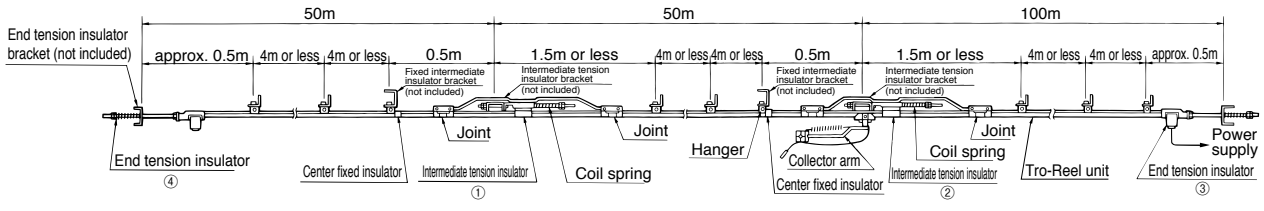
● **Indoor area only**



■ Line length of 50-100m (Use end tension insulators on both ends.)



■ Line length of 100m or longer (Use tension insulators on both ends and intermediately.)



For brackets adjacent to Center fixed ediate insulators, use a [-shape bracket 75mm×40mm×5mm or larger.

Notes

●**If using an intermediate tension insulator, a fixed intermediate insulator is also necessary.**
●**Installation (tension application) procedures (tension application) should be performed in numerical order: ①, ②, ③ and ④.**

Unit:mm

Components for curved section installation

When installing the Tro-Reel on curved sections, tension must not be applied to curved sections. Therefore, for installation on curved sections, the line must have some straight sections where center fixed insulators, end tension insulators, or intermediate tension insulators can be installed for tension application.

Notes

Please follow the instructions below to prevent poor collector arm contact and separation from wires:

- Be sure to attach center fixed insulators at the joint between the curved section and the straight section to maintain tension in the straight section.
- Hangers should be positioned at an interval of 0.5m or less for curved sections and 4m or less for straight sections.but the place where the vibration is intense,and outdoor use, Hngers should be positioned at interval of 2m or less for straight sections.
- If using hangers with insulator, be sure to use twoof them in places where center fixed insulators are mounted.
- Do not position joints in curved sections.
- Power must be supplied to the Tro-Reel unit in straight sections.

● Minimum curve radius

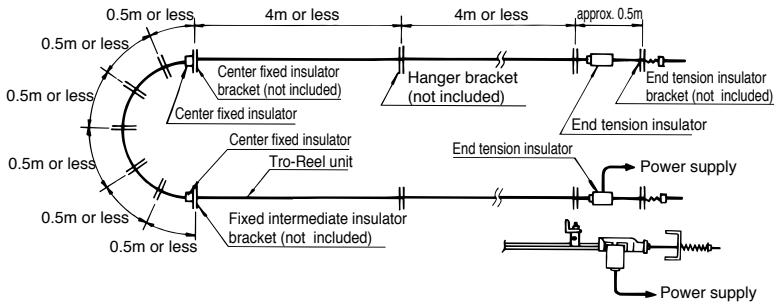
Rated current of collector arm	Minimum curve radius
30A	800mm
60A	1200mm
100A	2400mm

● Hanger interval

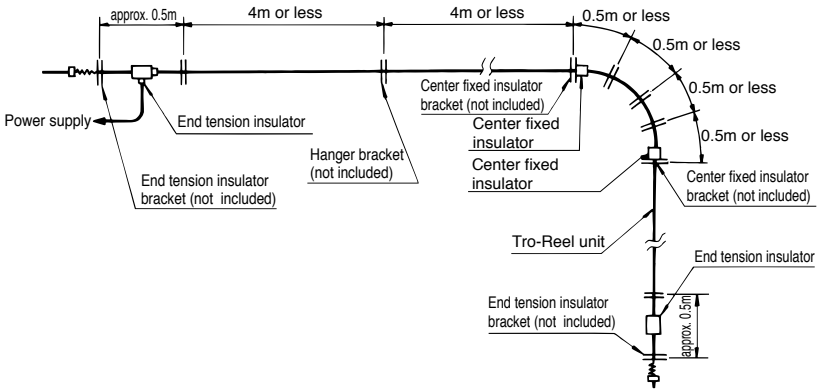
Hanger interval	curved sectoin	0.5m or less
	staight section	4m or less
		case of the outdoor areas and areas exposed to heavy vibration. 2m or less

For brackets adjacent to center fixed insulators, use a ⊏- shape bracket 75mm×40mm×5mm or larger. Failure to do so may cause poor collector arm contact or separation from wires.

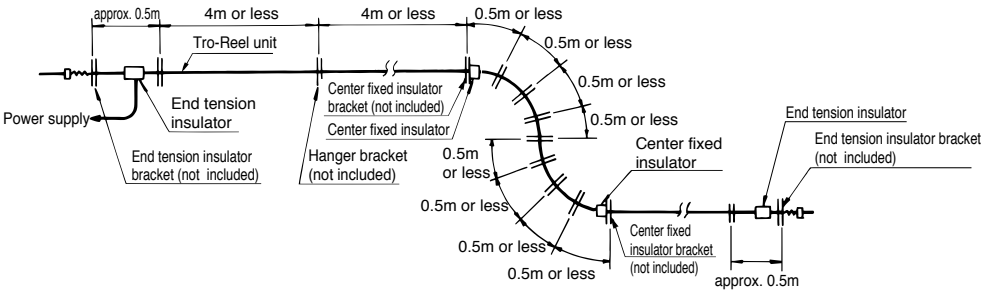
■U-shaped line



■L-shaped line

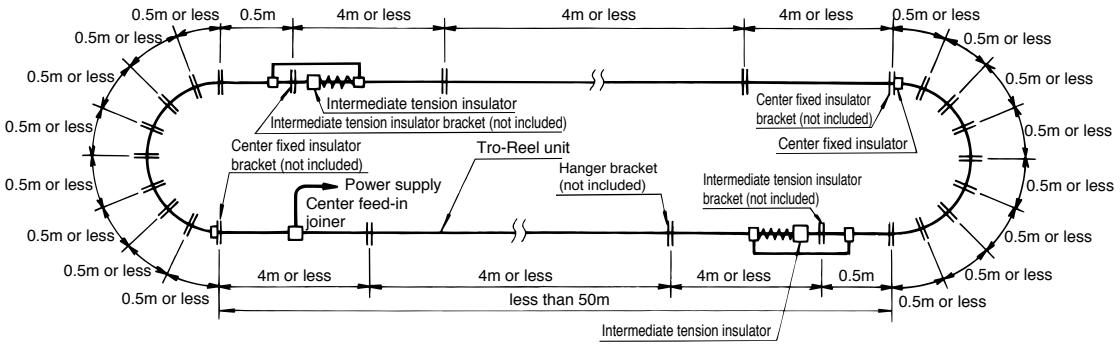


■S-shaped line



■ Endless line

(1) Straight line of less than 50m

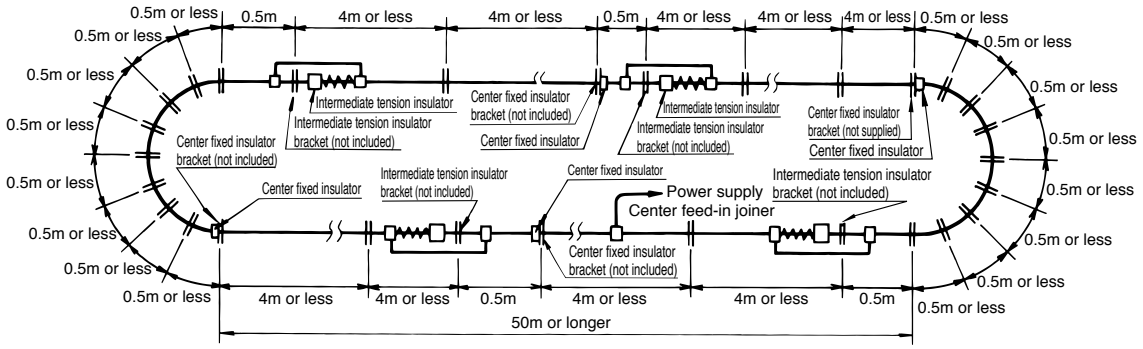


Notes

●If using a intermediate tension insulator, a center fixed insulator is also necessary.

(2) Straight line of 50m or longer

Intermediate tension insulators must be positioned at 50m intervals.



Notes

●If using a intermediate tension insulator, a center fixed insulator is also necessary.

Unit:mm

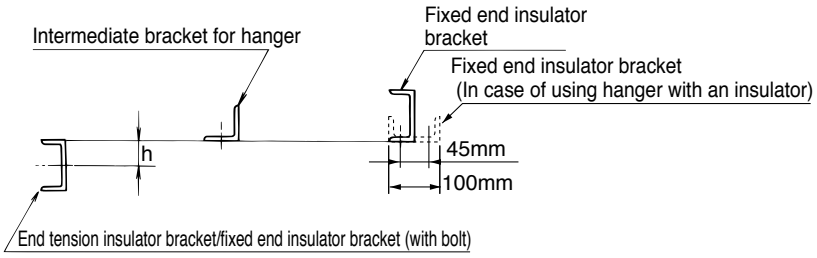
Bracket dimension and installation position

Make sure to have enough brackets for the entire length of the line.
two kinds of brackets are required: end bracket and intermediate bracket.

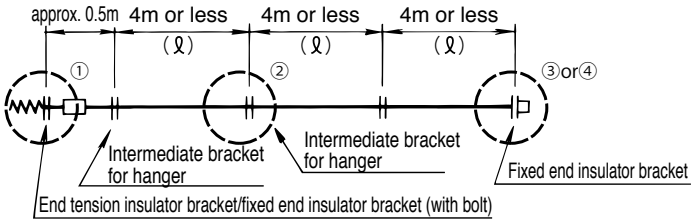
Notes

Since brackets are not included, it is necessary to prepare them before installation.

Straight installtion



Hanger types	h
Standard hanger	32mm
Hanger with insulator	57mm

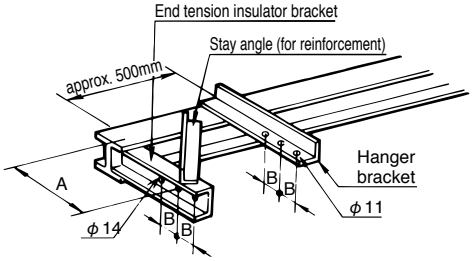


Type and use of bracket	Angle size	A size	B size	
			Minimum	Standard
For hanger	L -40×40×5	250～300mm	75mm	100mm
For end tension insulator	⊏ -75×40×5			
For fixed end insulator				
For fixed end insulator(with bolt)				
For fixed end insulator (In case of using hanger with an insulator)	⊏-100×50×5			

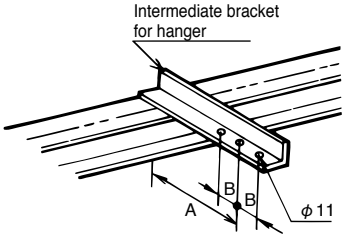
Notes

- **If using brackets other than specified above, use brackets of the same or superior strength.**
  Failure to do so may cause damage due to falling of equipment.
- **When mounting end tension insulators, attach an intermediate bracket 500mm away from the end bracket.**
  Failure to do so may cause poor collector arm contact.
- **End brackets must be reinforced with proper stay angles.**
  Failure to do so may cause damage due to falling of equipment.

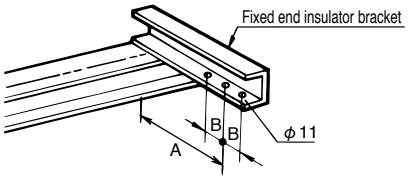
① End tension insulator section/fixed end insulator section (with bolt)



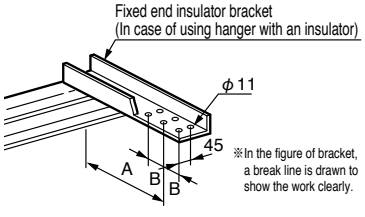
② Standard hanger section



③ Fixed end insulator section



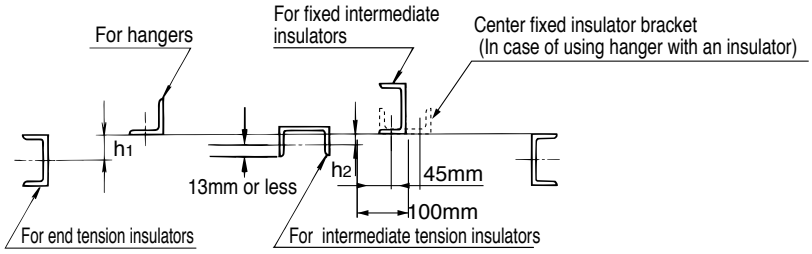
④ Fixed end insulator section
(In case of using hanger with an insulator)



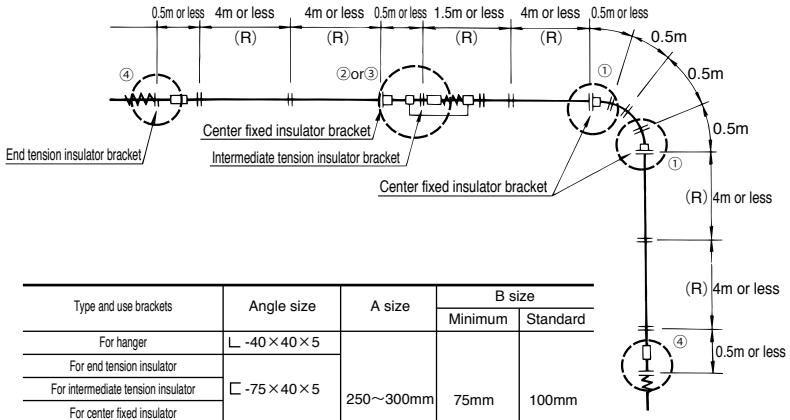
Notes

- **Mount the fixed end insulator brackets (for using a hanger with an insulator) of ⊏-100×50×5 size in the direction as shown in the figure.**

Curve installation



Hanger types	h1	h2
Standard hanger	32mm	8mm
Hanger with insulator	57mm	33mm

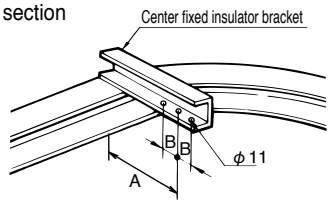


Type and use brackets	Angle size	A size	B size	
			Minimum	Standard
For hanger	L -40×40×5	250～300mm	75mm	100mm
For end tension insulator	C -75×40×5			
For intermediate tension insulator				
For center fixed insulator				
For intermediate tension insulator (In case of using hanger with an insulator)	C-100×50×5			

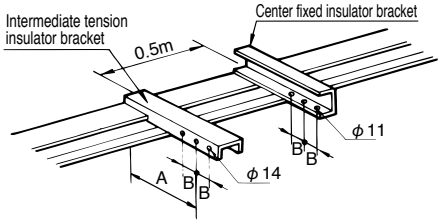
Notes

- **If using brackets other than specified above, use brackets of the same or superior strength.**
  Failure to do so may cause damage due to falling of equipment.
- **When mounting end tension insulators, attach an intermediate bracket 500mm away from the end bracket.**
  Failure to do so may cause poor collector arm contact.
- **End brackets must be reinforced with proper stay angles (reinforcing structure).**
  Failure to do so may cause damage due to falling of equipment.

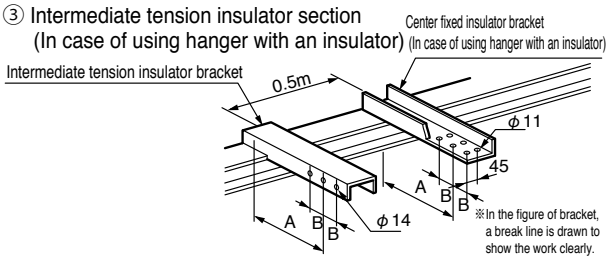
① Center fixed insulator section



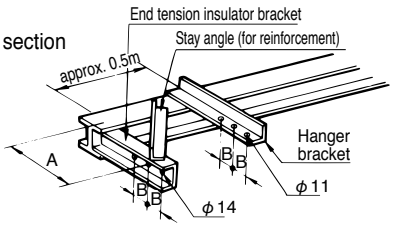
② Intermediate tension insulator section



③ Intermediate tension insulator section
(In case of using hanger with an insulator)



④ End tension insulator section



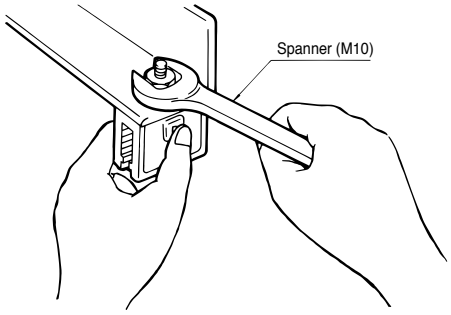
Notes

- **Mount the fixed end insulator brackets (for using a hanger with an insulator) of C-100×50×5 size in the direction as shown in the figure.**

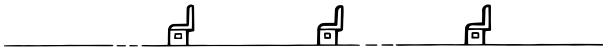
Unit:mm

Basic procedures for straight installation

1 Mounting hangers on the bracket



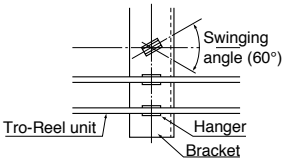
- Hangers should be mounted on the bracket beforehand on the ground.



Notes

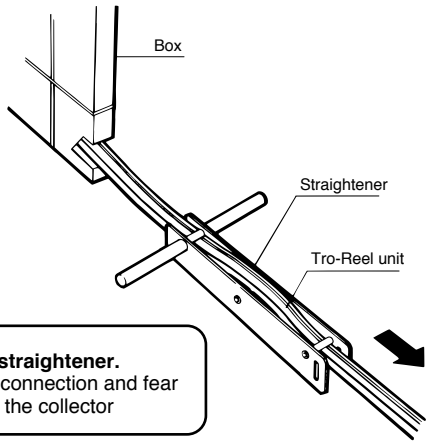
●**Brackets must be mounted parallel to the line.**
Failure to do so may cause poor collector arm contact or separation from wires.

- A hanger can rotate on its axis. Confirm rotate angle on its axis (Max 30 degrees) after mounting it to a racket.



2 Unpacking and cutting the Tro-Reel unit.

Stand the Tro-Reel box upright and pull out the unit out from the bottom of the box. Use the straightener to remove curl in the coil and prevent unit twisting.



Notes

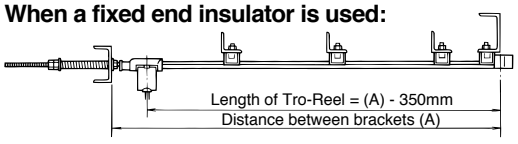
●**Please use the straightener.**
There are a bad connection and fear of the dropout of the collector

■ Cutting the unit to the length of the line.

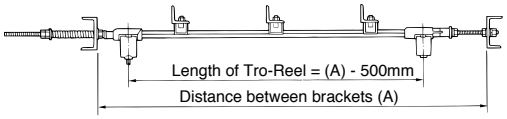
Measure the distance between the brackets at both ends (the range of practical collector servicing ＋1m) and cut the unit to that length.

■ One-end tension system

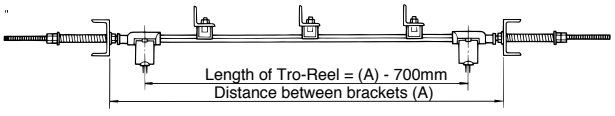
- **When a fixed end insulator is used:**



- **When a fixed end insulator (with bolt) is used:**



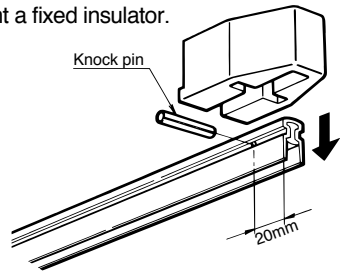
■ Both-end tension system



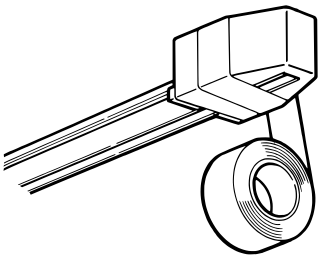
3 Mounting the fixed end fixture (for less than 50m)

● **When a fixed end insulator is used:**

1. Drill a ϕ5mm hole 20mm away from the end of the Tro-Reel unit, drive in a knock pin, and mount a fixed insulator.



2. Use insulation tape on the fixed insulator to prevent damage due to falling of equipment.



● **When a fixed end insulator (with bolt) is used:**

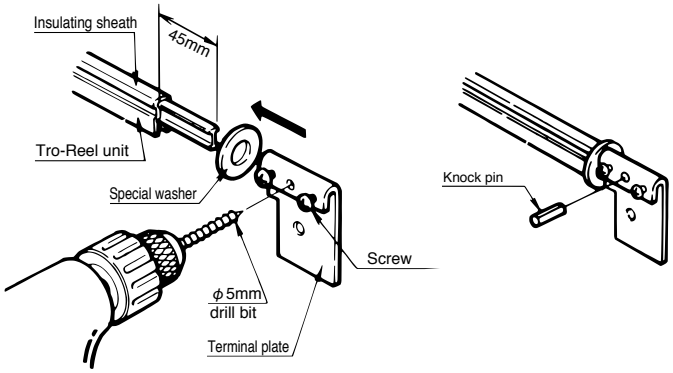
Mount the insulator the same way as ■-■ (Mounting an end tension insulator).

4 Mounting the end tension insulator terminal plate to the Tro-Reel unit

1. Cut 45mm off of the end of the Tro-Reel insulating sheath. Attach the special washer and terminal plate. Tighten the terminal plate screws.
2. Drill a ϕ5mm hole into the Tro-Reel conductor and drive in a knock pin.

Notes

● **Be sure to mount the special washer.** Failure to do so may cause damage due to falling of equipment.

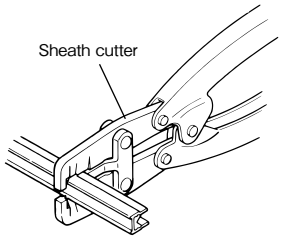


● There is a sheath cutter for Tro-Reel that enables smooth cutting of insulation sheath. (For use of 60A, 150A and 200A units)

Notes

● **The sheath cutter cannot be used for 300A unit.**

● Attach insulators after the Tro-Reel unit is mounted on the ceiling. Attaching insulators beforehand makes it difficult to lift the unit.

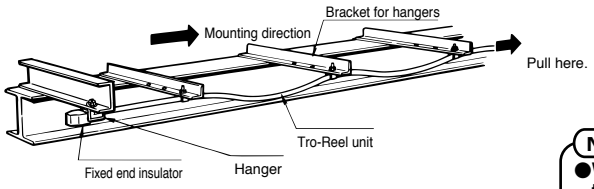


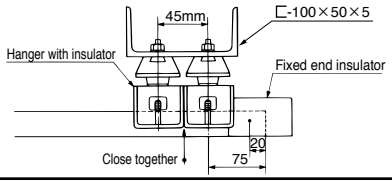
Unit:mm

5 Lifting the Tro-Reel unit and securing it to the brackets starting on the fixed end insulator side

Temporarily mount the unit on the hangers in order starting at the end. Pull the unit with a rope, and make sure that it doesn't sag.

● **When a fixed end insulator is used:**

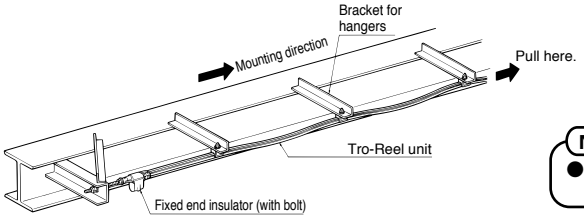


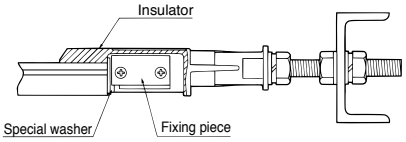


Notes

●**When using hangers with insulators, be sure to mount two of them with close together.**
Failure to do so may cause damage due to falling of Tro-Reel unit by the damage of the hangers with insulators.

● **When a fixed end insulator (with bolt) is used:**

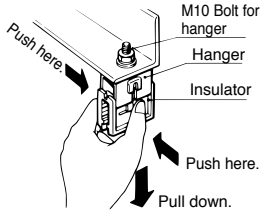




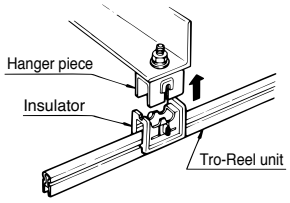
Notes

●**Be sure to mount the special washer.**
Failure to do so may cause damage due to falling of equipment.

■ How to mount the Tro-Reel unit

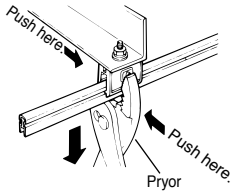


1. Remove the insulator from the hanger.



2. Fit the removed insulator into the Tro-Reel unit and push them securely into the hanger (as before). Failure to do so may cause damage due to falling of equipment.

■ How to remove the Tro-Reel unit



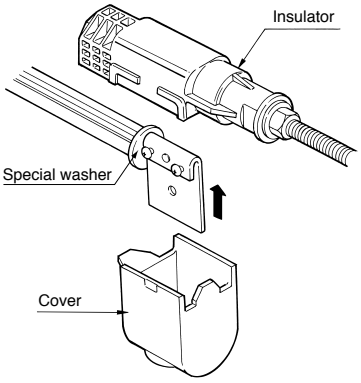
Grip the insulator buttons with pliers and pull it down.

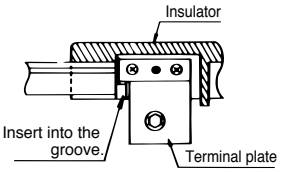
6 Mounting an end tension insulator to a terminal plate

1.Insert the terminal plate into the groove of insulator.
2.Mount the cover to the insulator.

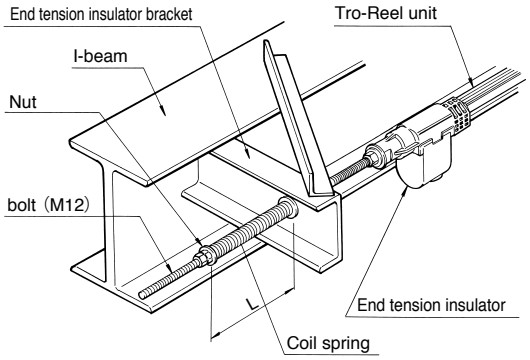
Notes

- **Be sure to mount the special washer.**
  Failure to do so may cause damage of the insulator.





7 Tightening the Tro-Reel unit



Pull the Tro-Reel unit tight and tighten the end tension insulator nut snugly.

- **Length of coil spring**

Ambient temperature during installation	L	Tension (N)
10℃ or lower	115mm	2254
11～40℃	125mm	1568

Notes

- **After completing installation, run the hoist or crane ten or more times and reconfirm the spring tightening length.**
  Failure to do so may cause poor collector arm contact or separation from wires.
- **After installation, let the hoist and crane travel for more than 10 times and recheck the tightness of spring. If this job is not properly done, bad contact or detailing of collector arm may occur.**

8 Feeding power to the Tro-Reel Power can be fed from the line end via an end tension insulator.

Connect the power wire to the terminal plate using a crimp-on terminal.

⚠ Caution

Terminal screws must be securely tightened.
Failure to do so may cause fire.

Applicable crimp-on terminals: ≤50mm^2 (60A, 150A)
≤100mm^2 (200A)
≤150mm^2 or 100mm^2 × (300A)
Crimp-on terminals are not included.