Panasonic Tro-Reel Operation Manual

60A/150A/200A/300A(For indoor and outdoor use)

The product-life is different in use conditions and the service space, however, It is possible to use it for about t 10 years by regularly maintaining and the regular service in correct construction.

Before using, be sure to read through this Operation / Installation Manual and use the product correctly.

After reading, keep this Operation / Installation Manual with you for your reference.

Ask qualified electrician for troubleshooting and maintenance.

Please be sure to show this Operation / Installation Manual to that engineer.

We have quality, strive to improve reliability, however, It finally becomes difficult the continuing use due to the deterioration of the material. Deterioration is different in use conditions like the availability and the ambient environment, etc. butdegrading the year.

In the worst case degradation is the cause of the fire burning, so we recommend early inspection and replacement.

• For a long time - you use this product on your own, "Maintenance Table" Please always check regularly once a year based on the least.

· If you have trouble checking in, please contact the electrician.

•This product is an important asset - customers. Please check and the following things must be observed.

•This product is an important asset of customers. Please check and understand the following text carefully. In addition, safety precautions, to the extent expected by the Company are listed.

## Precautions on installation

Installation of the High-Tro-Reel must be performed only by a licensed electrician. To prevent injury or accidents, always pay attention to the following points.

## Warning

• Do not modify the Tro-Reel HS in any way. Otherwise, electric shock, fire or damage due to falling of equipment may occur.

• Do not use where exposure occurs. Otherwise, electric shock, fire or damage due to falling of equipment may occur

- Use at ambient temperature -10 ~ 40 . If you use outside this temperature range, please contact Panasonic Corporation.
- If any abnormalities occur, turn off the power immediately and contact a gualified electrician for inspection and repair. Otherwise, electric shock, fire or damage due to falling of equipment may occur.
- The replacement product is required for electrical worker qualifications.
- Do not use the collector shoes past replacement indication lines.
- Otherwise, a unit may produce sparks, causing fire, poor contact or separation of collector arms from wires.
- To prevent electric shock, be sure to turn off the power before starting any inspection. Otherwise, electric shock may occur.
- Be sure to do a pre-use test run of equipment and do periodic inspections.
- Otherwise, electric shock, fire or damage due to falling of equipment may occur.
- When damage and crack occurred in the insulating sheath of the duct, please change the duct.

Otherwise sparking may occur, causing fire, poor contact, or derailing of the trolley, etc.

## Caution

- This product is for general indoor use only. Do not use this product for a damp place, a place where corrosive gas is generated or a place where cutting oil is directly splashed. Electric shock, fire or damage due to equipment falling may occur.
- Collector shoes use a dry lubrication system. Do not apply any other lubricants to the collector shoes or a unit's conductor surface.poor contact may occur.
- If products are not used for a long period of time, the unit's conductor surfaces may become oxidized, resulting in poor contact. Clean the conductors before resuming operation and be sure to do periodic inspections to prevent fire or electric shock.
- During the inspection, wear protective gear such as helmets and gloves. Observe may cause injury.
- When mounting the duct to the hanger, stuff a duct into a hanger not to pinch a hand. Observe may cause injury to your fingers.
- When remove the duct from the joiners, pull it out while holding the tip of the duct. so that the duct may not jump out from Joyner. Observe, damage to the ducts, may cause injury.
- When filing the ends of the duct, use protective gear such as glasses. Otherwise, your finger may be injured.
- Be sure to remove burrs using file after cutting, drilling. Observe may cause injury to your fingers.
- When replacing the current collector arm, Be sure that collector arms are mounted parallel to the duct unit with no twisting. Failure to conform to this table may cause poor collector arm contact or separation from wires.
- When replacing the collector, be sure to confirm the duct unit phase (R.S.T) before connecting the leads to the load. Failure to do so may cause fire due to sparks.

Panasonic Corporation Power Components Business Unit 1048,kadoma,kadoma,oosaka,571-8686,japan Telephone:+81-06-6908-1131 ©Panasonic Corporation 2012



# **Tro-Reel Installation Manual**

60A/150A/200A/300A(For indoor and outdoor use)

Before assembling, be sure to read through this Operation / Installation Manual for correct assembly.
 The work must be performed by a gualified engineer.

After setup, Please pass this Operation Manual / Installation Manual to the customer.

## **Precautions on installation**

Installation of the High-Tro-Reel must be performed only by a licensed electrician. To prevent injury or accidents, always pay attention to the following points.

## 🕂 Warning

- Do not modify the Tro-Reel HS in any way.
- Otherwise, electric shock, fire or damage due to falling of equipment may occur.
- Do not use where exposure occurs.
- Otherwise, electric shock, fire or damage due to falling of equipment may occur.
- Use at ambient temperature -10 °C ~ 40 °C. If you use outside this temperature range, please contact Panasonic Corporation.
   Install this product according to the construction rules in Electrical Equipment Technical Standards .
- Especially for the primary side of power supply of the duct, use an adequate over-current breaker. • Installation must be carried out correctly according to this Installation/Operation Manual included with the products.
- Improper installation may result in electric shock, fire or damage due to equipment falling.

## ▲ Caution

• Do not use this product for a damp place, a place where corrosive gas is generated or a place where cutting oil is directly splashed. (When corrosion resistance is required, please use the stainless steel products.)

- Do not install this product at the place where corrosion-resistance is absolutely necessary, for example, at ocean district, cement factory or sewage treatment plant. Electric shock, fire or damage due to equipment falling may occur.
- In case of using outdoor or at a very damp indoor, use hanger with an insulator.
- Position the opening of a unit facing downward or sideways. If installed with the opening facing upward, a unit may produce sparks, causing fire, poor contact or separation of collector arms from wires.
- When damage and crack occurred in the insulating sheath of the duct, please change the duct.
- Otherwise sparking may occur, causing fire, poor contact, or derailing of the trolley, etc. • When mounting the duct to the hanger, stuff a duct into a hanger not to pinch a hand.
- Observe may cause injury to your fingers.
- When remove the duct from the joiners, pull it out while holding the tip of the duct. so that the duct may not jump out from Joyner. Observe, damage to the ducts, may cause injury.
- When filing the ends of the duct, use protective gear such as glasses.
- Otherwise, your finger may be injured.
- Be sure to remove burrs using file after cutting, drilling. Observe may cause injury to your fingers.
- Use products only within the specified rating and load capacity. Violation of specified ranges may cause burning or fire.
- Firmly fix this product to the material of construction and construct it. Otherwise, fire or damage due to falling of equipment may occur.
- Construct the material of construction that installs the product firmly.
- Otherwise, damage due to falling of equipment may occur.



## Maintenance schedule of Tro-Reel

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The product-life is different in use conditions and the service space, however, It is possible to use it for about t 10 years by regularly maintaining and the regular service in correct construction.

Please check by the maintenance table based on this maintenance schedule. Refer to the maintenance table for a concrete check item.

#### Maintenance done by the electrical work trader.

	At introduction	The 5th year	The 10t	n year
	<ul> <li>Check the presence of remarkab (Once every 3 to 6 months) → C</li> </ul>	le dirt of the surface of the condu lean it with the cotton waste etc.	ictor.	
	<ul> <li>Check the Tro-Reel unit doesn't to (Once every 3 to 6 months) →Re</li> </ul>	become it in a zigzag line. Eview the size between conductor	s in the joint.	
Tro-Reel unit	<ul> <li>Check the Tro-Reel unit is not aw (Once every 3 to 6 months) →Ins</li> </ul>	vay from the hanger. stall the Tro-Reel unit on thehange	er.	
	<ul> <li>Check whether there is not cracl (Once every 3 to 6 months)</li> <li>→Product exchange recommendation</li> </ul>	k and a lack of the insulation shea tion that exchanges the Tro-Reel ur	ith nit.	
	• Check the coil spring length. (Once	every 3 to 6 months) →Adjust to p	oroper length.	
End tension	<ul> <li>Check whether there is loosening (Once every 3 to 6 months) →Re</li> </ul>	g of the nut of the coil spring. tighten.		
	<ul> <li>Check whether the resin has not been damaged. (Once every 3 to 6 months)</li> <li>→Exchange products.</li> </ul>		n.	
. loiner	<ul> <li>Check whether there is loosening (Once every 3 to 6 months) →R</li> </ul>	g of the fixation screw or the term etighten.	ninal screw.	xchai Idatic
Center feed-in joiner	<ul> <li>Check whether the resin has not b         →Exchange products.</li> </ul>	een damaged. (Once every 3 to 6 r	months)	uct e) mmer
	$\cdot$ Check whether there is loosening of	the nut. (Once every 3 to 6 months)	) →Retighten.	rod
Hanger	<ul> <li>Check whether the resin has not b →Exchange products.</li> </ul>	een damaged. (Once every 3 to 6 r	months)	ЩΕ
End tension insulator· Check whether the resin has not been damaged. (Once every 3 to →Exchange productsGuide cap Insulating piece· Check whether the resin has not been damaged. (Once every 3 to →Exchange products		en damaged. (Once every 3 to 6 mor	nths)	
	$\cdot$ Check whether there is loosening of	the bolt. (Once every 1 to 3 months	s) →Retighten.	
Collector arm	<ul> <li>Check whether wear has reached the replacement line. (Once every 1 to 3 months)</li> <li>→Exchange the collector, when worn out to the replacement line.</li> </ul>			
	<ul> <li>Check damage of spring pin and rotati (Once every 1 to 3 months)→Exchange produ</li> </ul>	ion axis, wear-out of metal fittings of s ucts when damage or abnormality is found. Ple	pring receiving. ase keep normal.	

Notes

 $\stackrel{\scriptstyle \frown}{<}$ To Maintenance manager>

· Inspections item at the time of the pre-use test run(Checking at periodic inspection). For using safely, please inspect the system one month after starting regular operation.

The inspection cycle is mentioned below. However, determine your own inspection cycle based on the actual operating rate and environmental condition. Items in bold: Inspection items requiring particular attention.

Is not there the exposure of the conductor?

Are not there the cracks and damaged on a

Isn't there the slack of the connection bolt?

Are not there the cracks and damaged on a

Are not there a loser of the cover part, the falling off?

Isn't there the conductor of the joint have a gap and the step?

Are not there a loser of the cover part, the falling off?

Is not there the torsion?

resin part?

resin part?

Center fixed

Joiner

nsulato

				$\bigcirc$ : Exchange required
	Result		Measures	• : Finished with exchange
		imes : Abnormality		△: Adjustment required
				▲: Finished with adjustment

The check A title Check day Y П М person in charge Name **Contents of inspection** Remedy \* Result Measures Inspection cycle (standard) Check to see if there is any foreign particles Clean with a specific purpose cleaner or waste adhering on its sliding surface or if it is seriously contaminated? cloth. Is there any ark generated protrusion on its Remove any protrusion (convex) on the arc sliding surface? scratch using a file. Is there damage and crack at the insulating When damage and crack occurred in the insulating  $\square$ sheath ? sheath of the duct, please change the duct. Tro-Reel uni Is there sharpen at the insulating sheath ? When thickness of the insulating sheath is equal to or less than 1.2mm, please change the duct. Is the duct installed in parallel for a rail? Please adjust the duct so that it is parallel at a rail. С Isn't the unit dislocated from the hanger? Review for any dislocated position on the unit.  $\bigcirc$ Correct if any. Are not there remarkable torsion and the curve of the duct? Please revise turning remarkable torsion. If it exceeds a threshold amount of wear, please replace the main conductor Amount of wear of the conductor is correct? In case of wearing down to the replacement indication line at next inspection, Amount of wear of the conductor o : 0.5 mm or less please replace earlier than usual. Don't the insulated sheath and the resin part Check the amount of wear of the collector and 0 of collector spinning shaft touch? conductor of the duct, replace it if necessary. Are not there the cracks and damaged on a When damage and crack occurred in the fixed without bolt Fixed end insulator  $\bigcirc$ resin part? end insulator, please change it. Do stop it i in an insulating tape? Please install an insulating tape. Are not there the cracks and damaged on a When damage and crack occurred in the fixed С insulator (with bolt) Fixed resin part? end insulator, please change it. Is't there the slack of the lock bolt?  $\bigcirc$ Retighten enc Is not there the torsion?  $\bigcirc$ Please revise torsion. Is not there the exposure of the conductor? Please install a repair cover for sheaths  $\overline{}$ Is the coil spring set definitely? Please adjust it to reasonable length Once Length of the coil spring L =115-125mm When tighten the duct, Please tighten a nut of every the tightening bolt with balancing in turn. 3 to 6  $\bigcirc$ months Ambient temperature the case of less than 10°C 115mm End the case of  $11^{\circ}$ C  $\sim 40^{\circ}$ C 125mm tension insulator Does not a nut (a double nut) of the coil spring Retighten С part have the slack? Does not a bolt for electric wire connection of Retighten С the feeding-in terminal part have the slack? Are not there the cracks and damaged on a resin part? When damage and crack occurred in it, please change it. С When loser and the falling off occurred, confirm Are not there a loser of the cover part, the falling off? 0

Please install the cover.

Please revise torsion.

Please install the cover.

Please revise a gap, the step.

change it.

change it.

the state of the cover, and please install the cover.

When damage and crack occurred in it, please

Retighten (tightening torque  $6.9 \sim 7.9 \text{N} \cdot \text{m}$ )

When damage and crack occurred in it, please

C

С

С

 $\bigcirc$ 

0

 $\cap$ 

Please install a repair cover for sheaths

Name

Center feed-in joiner

Hanger

Contents of inspection	Remedy	*	Result	Measures	Inspection cycle (standard)
Isn't there the slack of a bolt for electric	Retighten				
wire connection of the feeding-in joiner ?					
Are not there the cracks and damaged	When damage and crack occurred in it,				
on a resin part?	please change it.	$\square$			
Are not there a loser of the cover part,	Please install the cover.				
the falling off?		$\square$			
Is the hanger installation pace equal to	Please install a hanger to become equal				
or less than 4m?	to or less than 4m.	$\square$			
As for the curve department and the	Please install a hanger to become equal				
hanger installation of both ends of the	to or less than 500mm.	$\cap$			
terminal tightening insulator, is the pace					
equal to or less than 500mm?		ļ			
Is not there the slack of the installation	Retighten	$\bigcirc$			
bolt?					
Are not there the cracks and damaged When damage and crack occurred in it,		$\bigcirc$			
on a resin part? Please change it.					
Is the center fixed insulator attached so Please adjust so that the gap between					
that the gap between the ducts may be	the ducts is set to 15mm $\pm$ 5mm.	$ \circ $			
set to 15mm ± 5mm?					
Is the coil spring set definitely?	Please adjust it to reasonable length.				
Length of the coil spring $L = 115$ -					
I25mm	Ambient temperature L				
	the case of less than 10°C 115mm				
	the case of $11^{\circ}C \sim 40^{\circ}C$ [125mm]	$\left  \bigcirc \right $			
Deep pet a put (a double put) of the soil	Patightan		<b>.</b>		Once
Does not a nut (a double nut) of the completing net boys the clock?					everv
spring part nave the slack?					3 to 6
wire connection of the feeding in joiner 2		$\bigcirc$			months
Are not there the cracks and damaged	When damage and crack occurred in it				
ALE HOL LITERE LITE CLACKS AND DAMAGED WHEN DAMAGE AND CLACK OCCULLED IN IL,					

Intermediate tension	Length of the coil spring L =115- 125mm	Ambient temperature L the case of less than 10°C 115mm the case of 11°C~40°C 125mm	0	 	0	
insı	Does not a nut (a double nut) of the coil spring part have the slack?	Retighten	0	 	every	
ulato	wire connection of the feeding-in joiner ?	Retignten	0		months	
	Are not there the cracks and damaged on a resin part?	When damage and crack occurred in it, Please change it.	0			
	Are not there a loser of the cover part, the falling off?	Please install the cover.	0			
Insul pie	Are not there the cracks and damaged on a resin part?	When damage and crack occurred in it, Please change it.	0			
ating 90e	Are not there a loser of the cover part, the falling off?	Please install the cover.	0			
Guide cap	Are the installation dimensions clearance? AK AK AK B AK B C AK B	Please revise it to dimensions in the clearance A B C length 10~30mm 5mm 7mm lower lower	0			
	Are not there a loser of the cover part, the falling off?	Please install the cover.	0			
	Does not the resin part have the abrasion?	When I am worn, please change				
	Are not there the cracks and damaged on a resin part?	When damage and crack occurred in it, Please change it.	0	 		

N.		Contents of increation	Damadu	×	Dent	Macause	Insusation and for the n
	me	Is installation dimensions H of the collector	Remeay Please correct so that the distance H	*	nesult	weasures	inspection cycle (standard)
		arms sliding surface	is set to $95$ mm(Central value of the collector arm permitted movable range $\pm$ 20mm) between the conductor sliding surface and collector arm mount rod. Please measure H size, where the collector shoes is touched in the hanger.	0			
		Does not the collector arm mount rod have the remarkable torsion?	When there is remarkable torsion, please revise the collector arm.	0			
		Does not the collector shoes have the	Please remove it with sandpaper.				
	Collector ar	Is there any serious wear to replacement indication line. Rplacement indication line	Collector shoes should be replaced when they partially wear down to the replacement indication line. Please exchange the collector shoes ahead of time when it will be worn out to the replacement indication line by the time of the next check.				Once
	m	The center of the both sides of the collector arm attachment and Tro-Reel unit arranges.	Please revise it so that the center matches.	0			every 1 to 3 months
		Is there any ark generated protrusion ?	Remove the protrusion (convex) on the				
		ls there any mounting put loosen?	arc scratch using a file. Retighten				
				0			
		Is there any curve or variation on the arm?	Replace the arm if there is curve or variation.				
		Is there any chip or broken?	Replace if chip or broken spring pin is found.				
		Is there any wear or hole loosen on spring	Replace the collector shoes if there is				
		Is there any damage on the sheath of lead wire?	If there is damage, replace the collector shoes.	0			
		Is the collector shoes pulled by the lead	If the collector shoes pulled, correct to	$\cap$			
<u> </u>		WIRE? Are there modification of a spring (6.2mm or more	nave extra length on lead wire. Deformation of the spring, if there is				
or tr	Colle	clearance between the spring) or rust on the spring?	rust, replace				
ansv	ort n	Are there abnormal wear?	If there is abnormal wear of the arm, replace the collector arm.	0			
erse	arm	Is there a loose the screws?	Tighten screws more.	0			

# When installing, pay special attention to this section.

Please read the following six precautions carefully before installing the Tro-Reel. Please be sure to confirm if follow or not the precautions during the work and after installation. Otherwise, fire, electric shock or damage due to falling of equipment may occur.

## **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°Cor 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.)



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 "
\$" and "a" to the same length.



# **Instllation Procedure**

Unit : mm



# **Standard Installation Procedures for Tro-Reel**

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







The asterisk (%) indicates the conductor sliding surface.

Installation size (mm) (mm)								
Size	A	size		B size				
Hanger types	Minimum	Standard	B1	B2	Вз			
Standard hanger	75	100	05	135	295			
Hanger with insulator			90	160	320			

Note: The B<sub>3</sub> size is applied for a L-shape bracket of  $40mm \times 40mm \times 5mm$ .

## Installation Procedures for Tro-Reel unit and hanger supporting distance

#### Tro-Reel unit mounting method and hanger intervals.



## **A** 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.

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# **Components for straight section installation**

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



#### 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.)



# **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, Hingers 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

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

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

## S-shaped line



## U-shaped line



#### L-shaped line





# 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.





# **Basic procedures for straight installation**

## 1 Mounting hangers on the bracket



## **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 and in the coil and provent unit twicting

to remove curl in the coil and prevent unit twisting.

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.



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

• When a fixed end insulator is used: 1. Drill a  $\phi$  5mm hole 20mm away from the end of the Tro-Reel unit, drive in a knock pin, and mount a fixed insulator.



• When a fixed end insulator (with bolt) is used: Mount the insulator the same way as 4-6 (Mounting an end tension insulator).

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



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

Insulating sheat

- 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  $\phi$  5mm hole into the Tro-Reel conductor and drive in a knock pin.



## 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.



## 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.



## **7** Tightening the Tro-Reel unit



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

#### • Length of coil spring

Insulator

Ambient temperature during installation	L	Tension (N)		
10°C 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.



## 9 How to mount collector arms

#### Standard installation



 Set the distance from the bottom surface of the Tro-reel conductor to the center of the collector arm mount rod (not included) to 95mm (in the center of the conductor cleraner mounting tolerance movable range 95±20mm)

•Arm must be attached parallel to the Tro-Reel unit without any twisting.

#### Use range of movable

When collector arm mount rod set up a reference position,

the operating range from 70mm  $\sim$  110mm of collector arm set up to be twisting. Adjust the arm mount rod between the High-Tro-Reel unit to become 110mm or less and 70mm or more at the center between hangers, and 70mm or more at the bracket.



#### Assembly in tandem configuration

•Two collector arms should be used together (tandem type) for circuit separation and line swiching, and especially in applications in which it is imperative that collector arms not be separated from wires. Tandem collector arms cannot be used horizontally. For horizontal installations, use a single-type collector arm.



# Horizontal installation

- •As shown in a figure,mounted collector arm support parts for transverse on base of the collector arm.
- Tightening torque of fixing screws  $\stackrel{\scriptstyle .}{\scriptstyle \cdot}$  0.98 N  $\cdot$  m  $\sim$  1.32 N  $\cdot$  m
- •Set the distance from the bottom surface of the Tro-reel conductor to the center of the collector arm mount rod (not included) to 95mm (in the center of the conductor cleraner mounting tolerance movable range 95±20mm)

Distance to the center of the collector arm from the center of the duct





## Horizontal installation with its opening facing into tandem-type

•Mounting the horizontal support parts in both the collector arms

# **Installation Procedures for other parts**

## 10 Conductor cleaner installation

 Set the distance from the bottom surface of the Tro-reel conductor to the center of the collector arm mount rod (not included) to 95mm (in the center of the conductor clerner mounting tolerance movable range 95±20mm)

#### Notes

- •The conductor cleaner must be mounted parallel to the Tro-Reel unit without any twisting.
- •When cleaning is complete, either remove the conductor cleaner, or tighten the adjustment screw so that the brush doesn't touch the conductor.



#### **Spacer** To straighten twists in the Tro-Reel unit.

#### • How to install a spacer

- Loosen clip screws and align B with the Tro-Reel unit installation intervals.
- 2. Snap the clips to the Tro-Reel units.
- 3. Make sure the screws are tightened securely. Failure to do so may cause damage due to falling of equipment.

#### • How to remove a spacer Insert a flat tip screwdriver between the

clip and the Tro-Reel and pry down with the screwdriver.



#### Sheath repair cover





Intermediate tension insulator Applies tension to a straight line of more than 100m or to an endless line, and absorbs expansion and contraction in the Tro-Reel unit due to temperature fluctuation.



#### Center fixed insulator This part is to be used in horizontal curves, and should be attached at the joint between straight and curved sections to apply tension in the straight section.



**Joiner** To connect Tro-Reel units together.

#### • 60A · 150A

- 1. Cut 40mm off of each end of the insulating sheath.
- Cut the insulating sheath completely off the recess on the side.
- 2. Sandwichthe conductor between joiner terminals. Tighten the bolts with a hex wrench tight [Setting Torque 6.9~7.9N·m]. Failure to do so may cause poor collector arm contact or damage due to falling of equipment.
- Fit on a Sheath repair cover . Apply the insulator along the center line of the insulating sheath cutaway.



#### 200A and 300A

- 1.Cut 40mm off of each end of the insulating sheath.
- Cut the insulating sheath completely off the recess on the side.
- 2.Connect the conductors with the terminal plates and drill φ5mm boles in the conductors.Insert
- knock pins through the holes. 3. Fit on a Sheath repair cover . Apply the insulator along the center line of
- the insulating sheath cutaway.

#### (Notes)

●Be sure to use a file of  $\phi$ 5 size. Failure to do so may cause poor collector arm contact or damage due to falling of equipment.



#### **Guide cap** To guide collector arms via turntables or traversers.



#### **Insulating piece** To Separate circuits electrically.

