

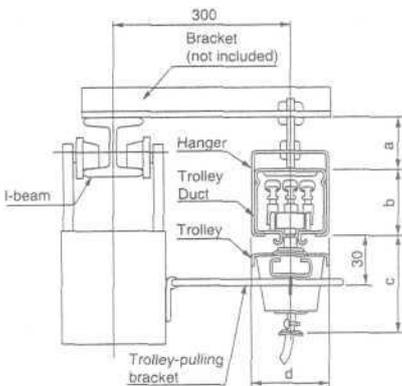
Trolley Duct installation procedures

The Trolley Duct can be simply installed by combining the duct, trolley, necessary parts and accessories selected to match the installation space conditions. Please be sure to correctly install the Trolley Duct by strictly following the procedure discussed below, in order to avoid fire, operator electrical shock, damage due to equipment falling and other hazards.

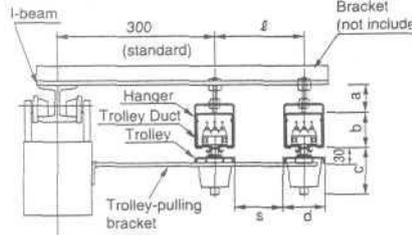
■ Trolley Duct installation dimensions

Dimensional relationships for I-beam or other building structures, the duct supporting bracket (not included), duct and trolley are as shown below. Use a trolley-pulling bracket for a pull-type trolley.

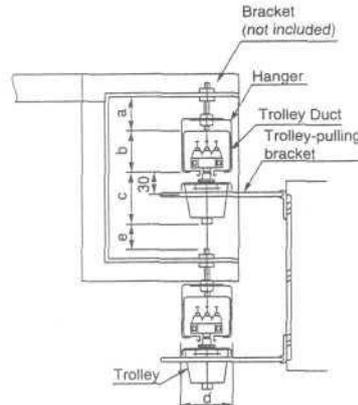
• Standard installation 30A/60A/100A



• Parallel installation 30A/60A/100A



• 2-stage installation 30A/60A/100A



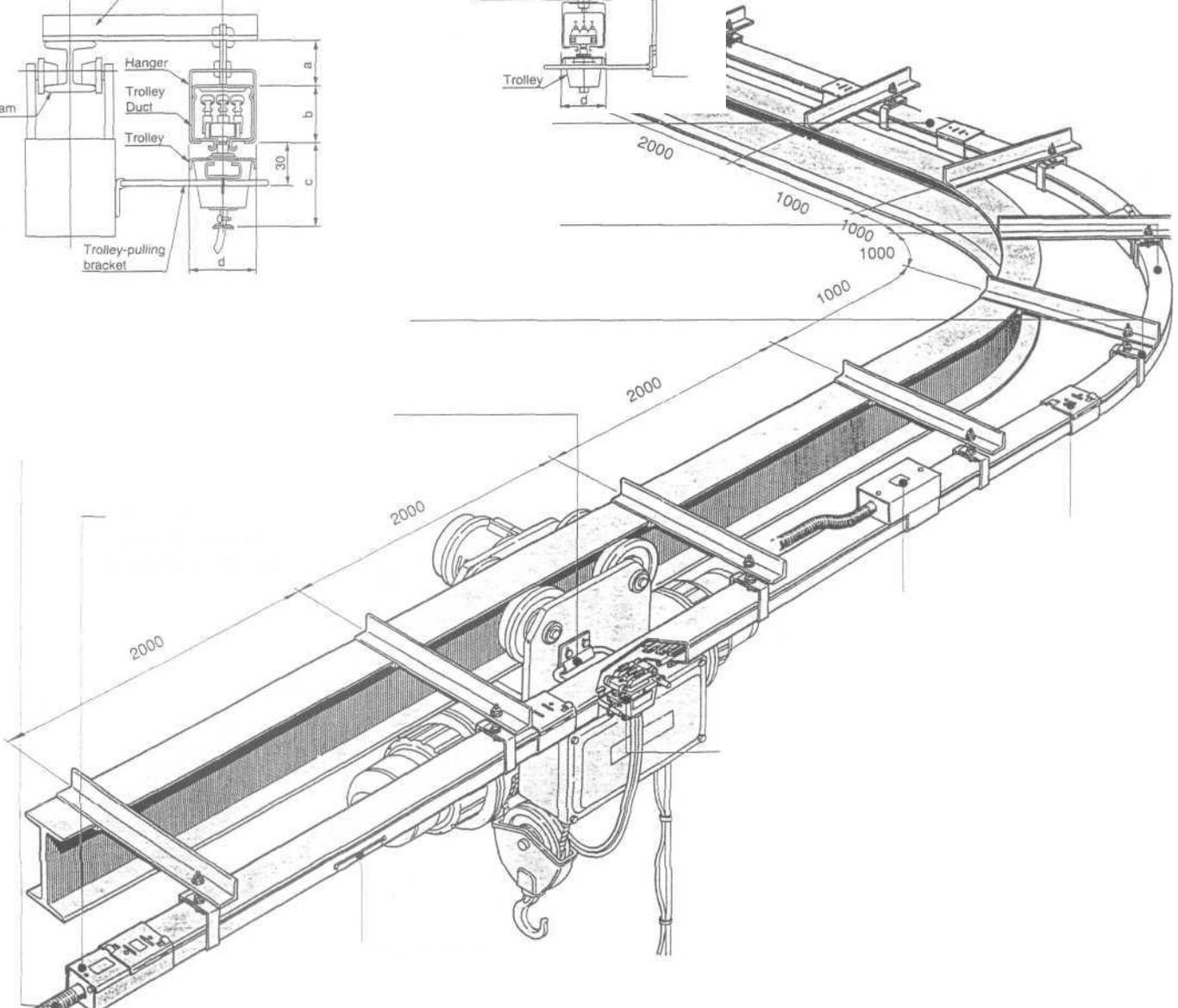
Unit mm

Duct rating	a	b	d	S	ℓ
2P 30V 30A	65	50	60	50	110
3P 60A					
4P 30V 30A	60	55	90		140
5P 60A					
2P 600V 100A					
3P					

(Caution)

"S" and "ℓ" on the above table indicate minimum dimensions.

Trolley rating	c	E
2P 300V 20A	92	Dimensions should be decided by taking lead slack allowance into consideration. Should sufficient length not be available for "e," use a side outlet cable trolley.
3P		
2P 300V 40A	100	
3P		
4P 300V 20A		
5P		



2P	600V	40A		
3P				
2P	600V	80A	120	
3P				

Caution

See table at right for dimensions.

- When installing the Trolley Duct, be sure to observe the following caution strictly, or fire, electric shock or damage due to equipment falling may result

end.

•Straight line duct

The basic Trolley Duct is available in standard lengths of 1m, 2m and 3m.

•Horizontally curved duct

For curved trolley line.

•Hanger

A supporting fixture for fastening the Trolley Duct to a building structure or machine

•Trolley-pulling bracket

For use with a pull-type trolley

•Hi-Flex (not included)

(Flexible conduit)

•Feed-in box

Mounted to the start end of the duct to feed power.

•Coupling plate (included with the duct unit)

For connection between ducts.

•Center feed-in box

For feeding power to the central duct connection section.

•Trolley

A branching device with a collector and traveling facility, for supplying power from the Trolley Duct to load.

1. Avoid using the Trolley Duct where:

- a) fine dust, steam, gas, and/or oil fumes are present in the environment.
- b) the ambient temperature is above 40°C

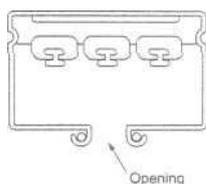
3.The Trolley Duct and trolley must be grounded to the electrical device being used.

•Drop-out duct

A duct with an opening for trolley insertion and removal

or sudden changes in temperature can occur.

2.The opening for the trolley should be placed at the bottom of the duct.



4.The hanger cannot be attached at the Trolley Duct connection section or at the trolley insertion opening of the drop-out duct.

5.Position the feed-in box and center feed-in box so that the cover can be opened and electrical wiring performed.

6.When two or more Trolley Ducts are installed adjacent to each other, a minimum space of 50mm must be between each.



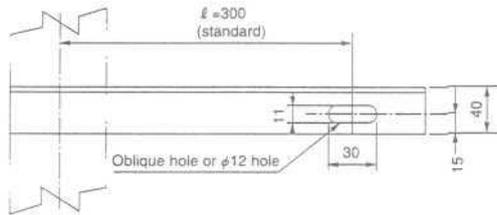
7.Do not install the Trolley Duct so it may warp or twist. 8.Do not subject the duct unit to shock or heavy loads. 9.Do not place heavy objects on top of the duct. The trolley is not meant to support a person's weight.

1 Making a bracket available

Brackets for mounting the trolley supporting hanger are not provided by Matsushita Electric Works, Ltd. Commercially available angles should be used.

Duct rating			Bracket
2P 3P	300V	30A 60A	L-40X40X5
4P 5P	300V	30A 60A	
2P 3P	600V	100A	

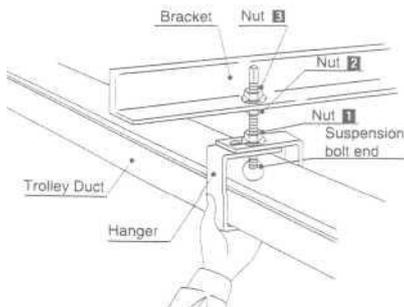
• Standard bracket dimensions 30A/60A/100A



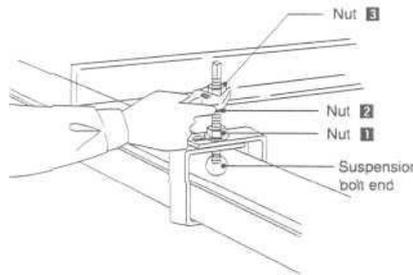
(Caution)

If brackets other than those shown above are to be used, the brackets must be of a material with strength equal to or surpassing the specified brackets, otherwise the Trolley Duct may fall. Determine "L" dimensions by taking the relationship with the device in use into consideration.

3 Installing the hangers



- Mount the hanger onto the bracket and temporarily secure the Trolley Duct as shown. Turn the bolt until its end slightly contacts the duct upper surface and tighten the nut 1 to secure the duct.

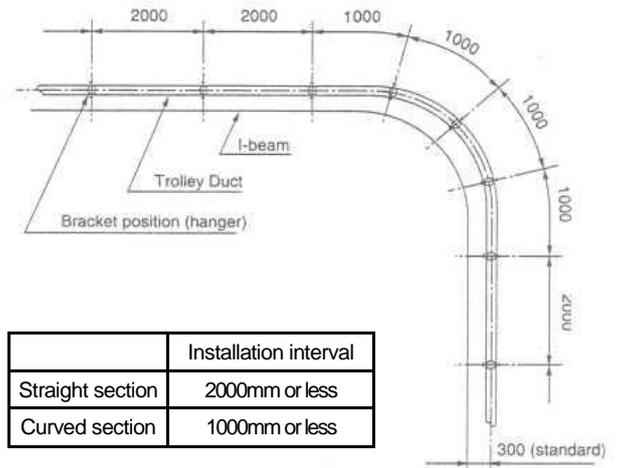


(Caution)

- For Trolley Duct connection, see section "4 Connecting the Trolley Duct sections."
- Check to see that the centers of the hangers and ducts are aligned correctly with each other; otherwise poor contact may occur or the trolley may separate from wires.
- Adjust duct height with the nut 3 and connect the sections of the duct. Securely attach the hanger to the bracket by tightening the nut 2. Make sure to tighten the nut 2 securely; otherwise the duct may fall.

2 Installing brackets

- Determine the bracket installation positions making sure that the hanger positions will not coincide with the Trolley Duct connections or drop-out duct openings for trolley insertion.
- Install the brackets on I-beams or other building structures.

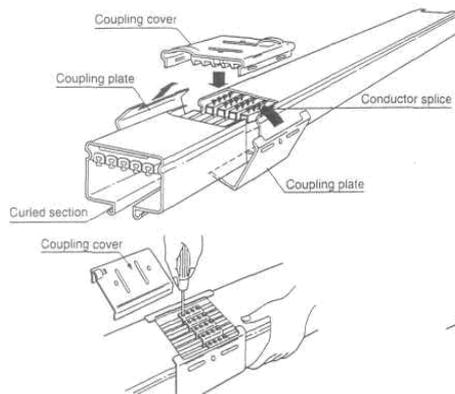


	Installation interval
Straight section	2000mm or less
Curved section	1000mm or less

(Caution)

- Standard installation intervals for brackets are shown above.
- Make sure to use at least one hanger for each duct, otherwise the duct may fall.

4 Connecting the Trolley Duct sections



Unit : mm

(Caution)

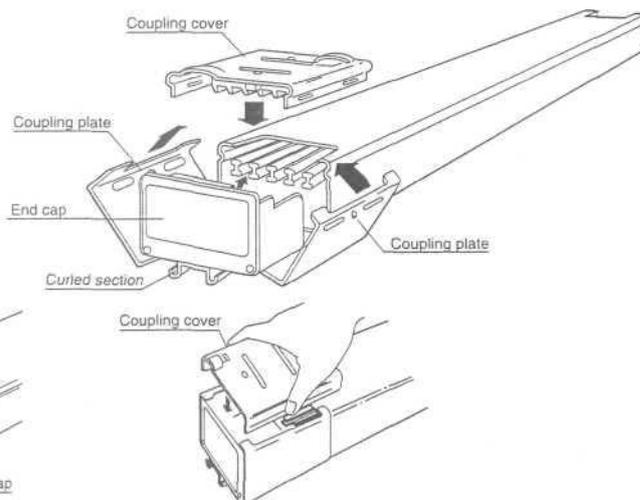
Drawing shows a 5P Trolley Duct.

① Insert the conductor splice into the conductor and connect the duct sections, and install the right and left coupling plates over the curled section as shown. Make sure to fit the left and right plates over the curled section correctly; otherwise the duct may fall.

② Move the conductor splice to the center of the connection section and tighten the screws securely. Then install the coupling cover. Screws must be tightened securely in order to avoid any danger from fire.

(Removing the coupling cover) The coupling cover can be removed easily by inserting a screwdriver into the hook of the coupling cover and lifting it up.

5 Installing the end cap



(Caution)

Drawing shows a 5P Trolley Duct.

① Fit the end cap onto the end of the duct and fit the left and right coupling plates over the curled section. Make sure to fit the left and right plates over the curled section correctly; otherwise the duct may fall.

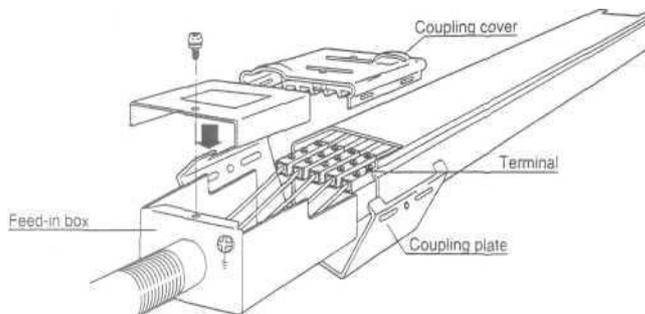
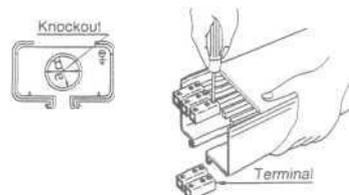
② Mount the coupling cover.

(Caution)

Be sure to install the end cap; otherwise electric shock may occur.

(Removing the coupling cover) The coupling cover can be removed easily by inserting a screwdriver into the hook of the coupling cover and lifting it up.

6 Installing the feed-in box



(Caution)

Drawing shows a 5P Trolley Duct.

•Knockout dimensions

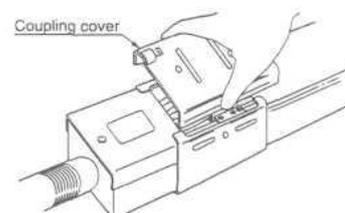
Rating	a	b
2P 300V 30A	φ 26.1	φ 32.5
3P 60A		
4P 300V 30A	φ 32.5	φ 38.8
3P 60A		
2P 600V 100A	φ 32.5	φ 38.8
3P		

Note

Remove the knockOut or make a hole in the end of the feed-in box before installing it to the Trolley Duct

① Insert the terminal into the conductor and tighten the screws securely. Fit the feed-in box onto the duct and install the left and right coupling plates over the curled section. Install the coupling plates securely over the curled section; otherwise the Trolley Duct may fall.

② Connect wires to the feed-in box terminal board. Hi-Flex (class 2 metal flexible conduit) is most appropriate for piping. Make sure to connect the wires to the terminal board correctly by securely tightening the terminal screws; otherwise fire may result.

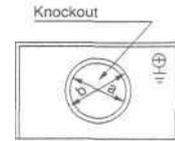
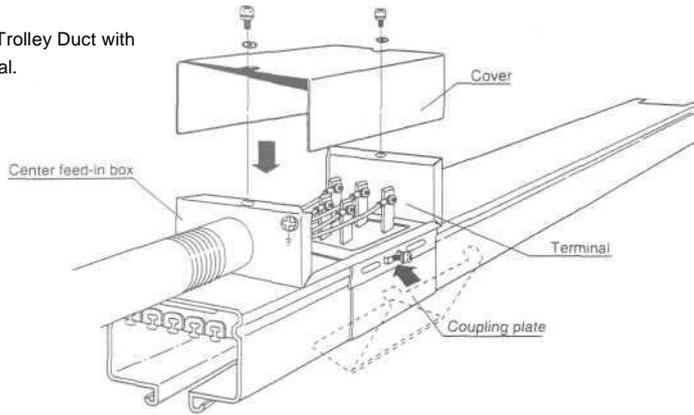


③ Install the coupling cover. To remove the coupling cover, insert a screwdriver into the hook of the coupling cover and lift it up.

7 Installing the center feed-in box

(Caution)

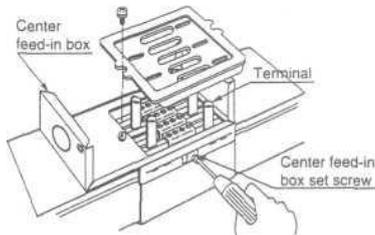
Drawing shows a 5P Trolley Duct with a longer center terminal.



• Knockout dimensions

Rating	a	b
2P 300V 30A	3P 60A	ϕ 26.1
4P 300V 30A	5P 60A	ϕ 32.5
2P 600V 3P	100A	ϕ 38.8

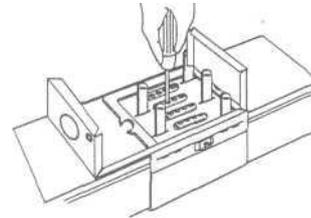
- ① Insert the terminals into the conductor as shown. Install the coupling plates, fit the cover and tighten the feed-in box set screws. Correctly install the coupling plates over the curled section; otherwise the Trolley Duct may fall.



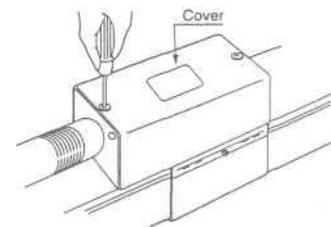
- ② Secure the terminals to the conductor. Hi-Flex (class 2 metal flexible conduit) is most appropriate for piping.

(Caution)

Tighten the terminal screws securely; otherwise fire may result.



- ③ After wire connections, place the cover.



8 Wiring

■ Connecting the power supply cables to the duct

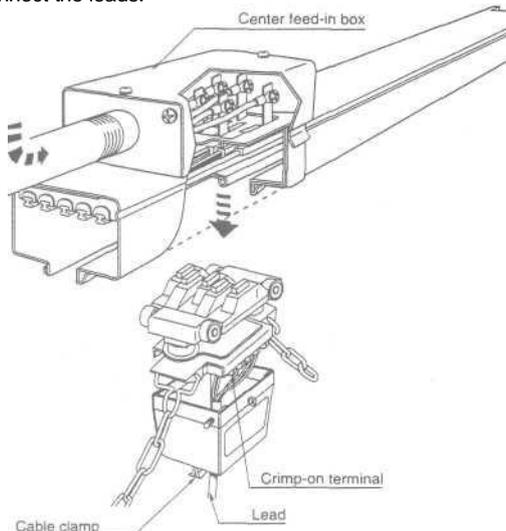
Connection of the power supply cables is accomplished within the feed-in box or center feed-in box. Compatible conduits and cables for each Trolley Duct are listed in the table at right.

■ Connecting wires to the trolley

Use cabtire cables for leads and tighten them securely using a crimp-on terminal. A 20A trolley comes with a 3.5mm² crimp-on terminal and the 40A trolley with a 5.5mm crimp-on terminal. With an 80A trolley, the leads should be directly connected to the terminal board. Use a cable clamp to securely connect the leads.

(Caution)

Tighten the terminal screws securely; otherwise fire may result. Connect leads with a comfortable margin of length in order to avoid subjecting the trolley to excessive force.



9 Installing and pulling the trolley

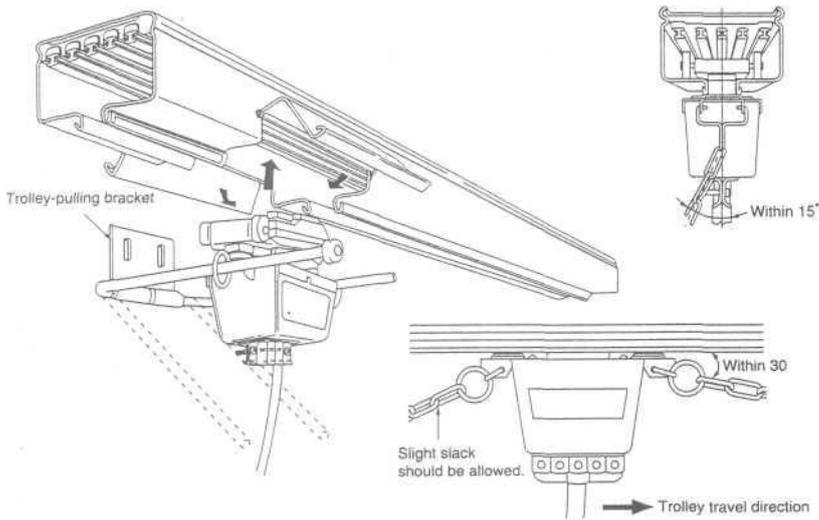
Trolley Duct type			Nominal dimensions of compatible flexible	Nominal cross-sectional area of compatible
Rated voltage	Rated current	No. of poles		
300V	30A	2·3 4·5	30	22mm ²
	60A		38	22mm ²
600V	100A	2·3	38	38mm ²

(Caution)

Select cables that match the load capacity. Using inappropriate cables may result in fire.

• Use cabtire cables for leads.

Trolley type			Compatible cables
Rated voltage	Rated current	No. of poles	No. of cores X nominal cross-sectional area X No. of cables
300V	20A	2	2 cores X 0.75 ~ 5.5mm ² X 1
		3	3 cores X 0.75 ~ 5.5mm ² X 1
		4	4 cores X 0.75 ~ 5.5mm ² X 1
	40A	2	2 cores X 0.75 ~ 5.5mm ² X 2
		3	3 cores X 0.75 ~ 5.5mm ² X 2
		5	4 cores X 0.75 ~ 3.5mm ² X 1
600V	40A	2	2 cores X 0.75 ~ 8.0mm ² X 1
		3	3 cores X 0.75 ~ 8.0mm ² X 1
		5	4 cores X 0.75 ~ 5.5mm ² X 1
	80A	2·3	2 cores X 0.75 ~ 8.0mm ² X 3
		3	3 cores X 0.75 ~ 8.0mm ² X 1
		5	4 cores X 0.75 ~ 5.5mm ² X 1



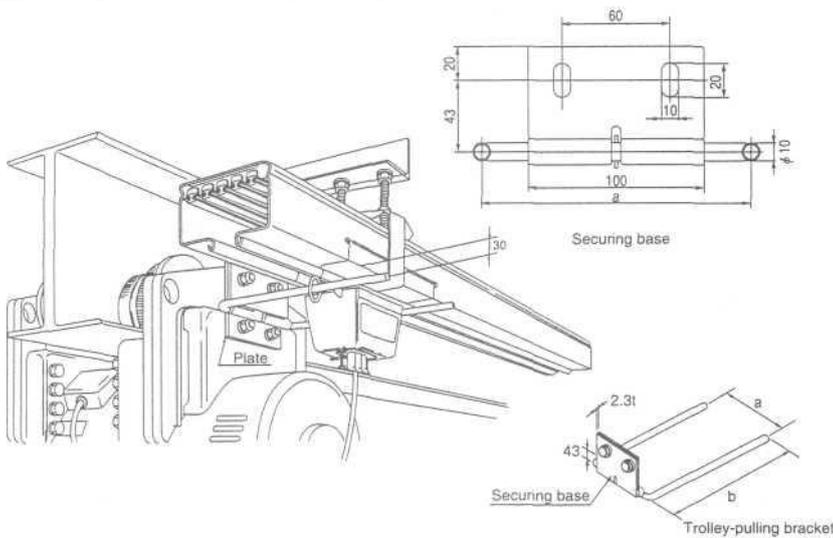
•Insert the trolley into the opening of the drop-out duct. The opening of the drop-out duct can be opened by grasping the lock pin and unlocking it. After installation of the trolley, securely close the opening. Incomplete locking may result in the trolley dropping down.

•After installing the trolley, hand-move it about 30cm to check to see that it moves smoothly and the collector and the duct conductor correctly contact each other. To pull the trolley in optimum conditions, using a trolley-pulling bracket is recommended.

•When using a chain for pulling the trolley, make sure that the trolley pulling angle is within the limit shown; otherwise poor contact may result or the trolley may separate from wires.

•Tighten the trolley-pulling bracket to the plate attached to the crane or hoist using bolts. The plate should be purchased separately. •A 30mm space should be allowed between the duct bottom surface and the trolley-pulling bracket rod. Installation position can be adjusted by changing the securing base direction and using the oblique hole. Use M8 bolts.

10 Using the trolley-pulling bracket



(Caution)

Strictly follow the installation dimensions shown; otherwise poor contact may result or the trolley may separate from wires.

Cat No.	DH6117	DH6119	DH6417
Product name	Trolley-pulling bracket A-1 (for single line)	Trolley-pulling bracket A-2 (for double line)	Trolley-pulling bracket B-1 (for single line)
Dimensions	a	145	145
	b	250	400
Compatible trolleys	2P20A 5P20A	3P20A 2P40A	4P20A 3P40A
			2P80A 3P80A

11 Connecting trolleys

Connecting two or more trolleys will facilitate smoother power collection in the following conditions. Use coupling fixtures when connecting trolleys.

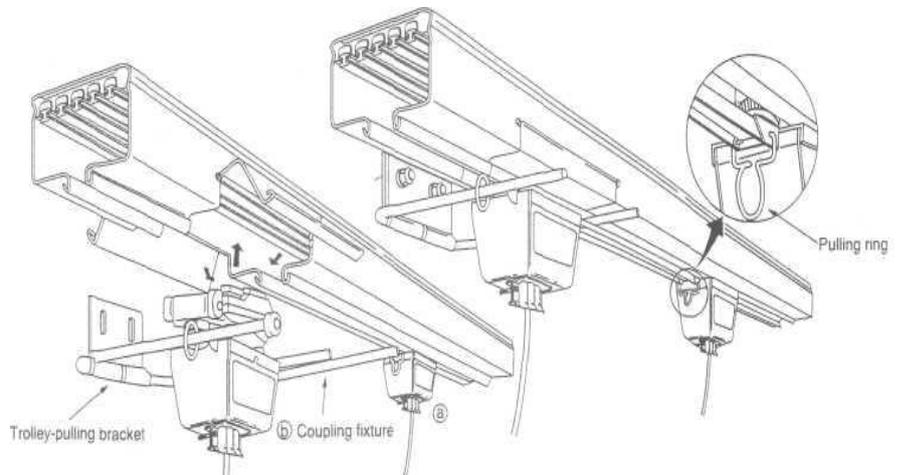
- (1)When a single trolley cannot provide enough capacity.
- (2)When trolley's separation from wires is a major problem. (When one trolley becomes separated from wires, the other can compensate for it, and vice versa.)
- (3)For point use. (There will be no insulated sections at switching points of ducts.)

•When mounting the coupling fixtures:

- 1)Insert the trolley ③ into the duct. 2)Hook the coupling fixtures onto the rings of trolley ③ and trolley ④ and insert the trolley ④ into the duct.

•When using the trolley-pulling bracket A-2 (for double line), do not use coupling fixtures.

•When connecting two trolleys, install the trolley-pulling bracket onto one of the two trolleys.



Cat. No.	Product name	Dimensions and shape	Trolley rating
DH6108	Coupling fixture A	25, 250, 10	2P20A • 40A 4P20A 3P20A • 40A 5P20A
DH6109	Coupling fixture B	30, 250, 13	2P80A 3P80A

(Caution)

When installing on curved ducts, the minimum radius must at least be 1,200mm; otherwise poor contact may result or the trolley may separate from wires.

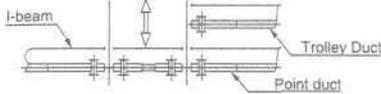
■ Sideway-traverse hangers

For applications where the I-beam or other structure onto which the Trolley Duct is installed is not stationary, but moves or rotates (e.g. crane girders, turntables, etc.), a sideway-traverse hanger capable of absorbing Trolley Duct vibration should be used, in order to avoid the duct dropping.

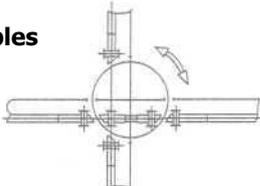
- Installing the sideway-traverse hanger
Press the ends of the sideway-traverse hanger suspension bolts against the duct upper surface.
- Locations where the sideway-traverse hanger should be used

① When using a point-use duct

• Traversers

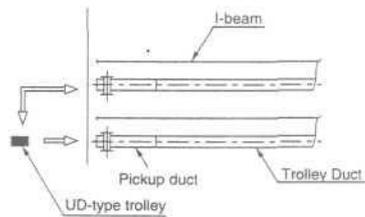


• Turntables



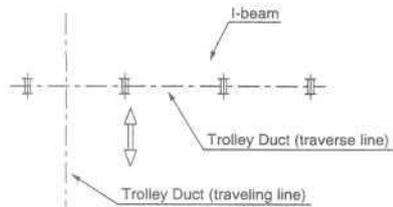
 : Locations where sideway-traverse hangers are used

① When using a pickup duct



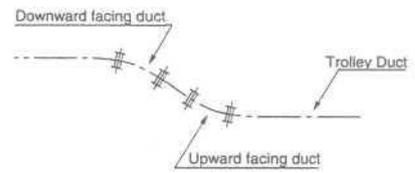
 : Locations where sideway-traverse hangers are used

② Trolley Duct for traverse movement



 : Locations where sideway-traverse hangers are used

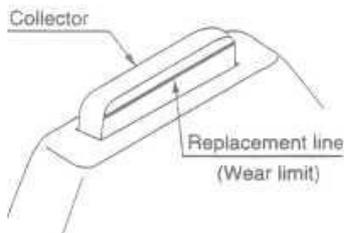
③ Vertically curved duct



 : Locations where sideway-traverse hangers are used

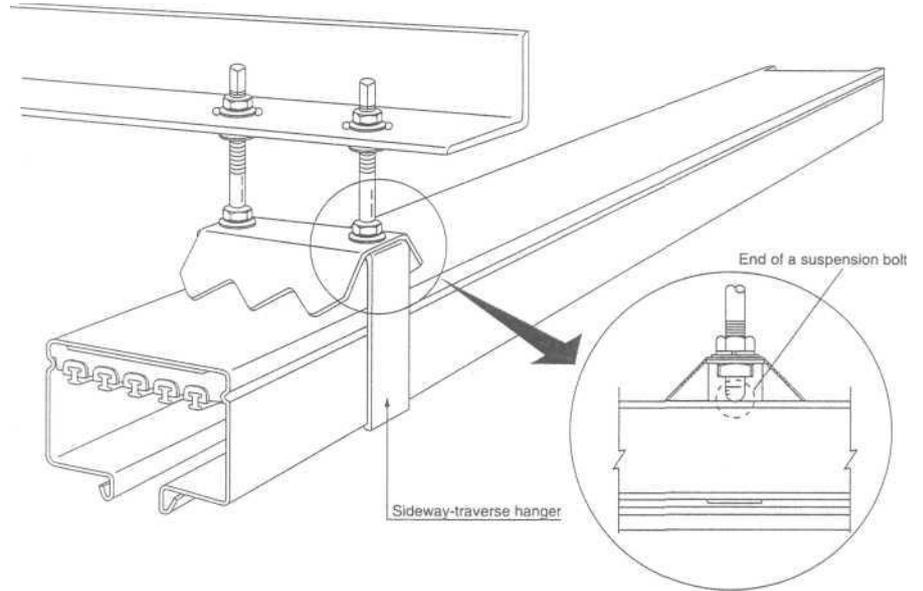
■ Replacement of collectors

Collectors have an engraved replacement line that indicates that replacement is necessary when wear up to the line is noticed.



(caution)

Wornout collectors may cause spark-induced fire, poor contact or the trolley may separate from wires.

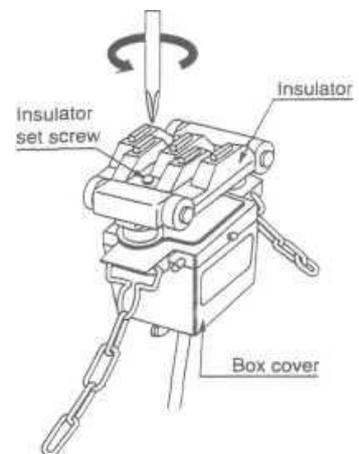


① Loosen the insulator set screw and remove the insulator.

② Remove the box cover.

③ CD Remove the lead clamping screw and terminal board and remove the collector.

※ Collectors are available separately



(Caution)

- When mounting the collector, make sure that the protruding section of the insulator correctly fits into the spring.
- Lightly press on the collector with a finger and check to see that it moves smoothly.

Conductor cutting methods

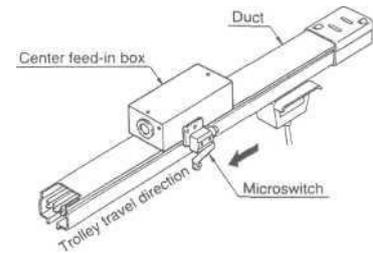
Name	Cutting point	Symbol
a -type cutting without neutral sections		
/J-type cutting with one neutral section)		
γ -type cutting with two neutral sections		

Circuit-separating duct type

Type	Standard duct length
α front-right	1,000mm
α front-left	"
α back-right	"
α back-left	"
β front-right	"
β front-left	"
β back-right	"
β back-left	"
γ right	"
γ left	"

Note

- 1: α, β, and γ, above, indicate conductor Cutting methods.
- 2: "Front" and "back," above, indicate the mounting direction of the center feed-in box (CTB) in terms of the trolley travel direction.
- 3: "Right" and "Left," above, indicate the microswitch mounting direction in relation to the trolley travel direction.



MS: microswitch Mg: Magnetic switch

- Note**
- 1: Magnetic switch connection is provided separately.
 - 2: A microswitch is included with a duct.
 - 3: An 80A trolley cannot be used.

Circuit-separating ducts

CTB mounting direction	Front		Back		Front/back
External view					
Conductor cutting point					
Symbol					

CTB: Center feed-in box, MS: Microswitch, G: Conductor guide

- Note**
- 1: The same cutting method should be applied to all the conductors to be cut (2P - 5P).
 - 2: Use a micro-rod attached trolley with a duct with a microswitch (see page 32 and 36).

Detailed information regarding switching points (traversers and turntables)

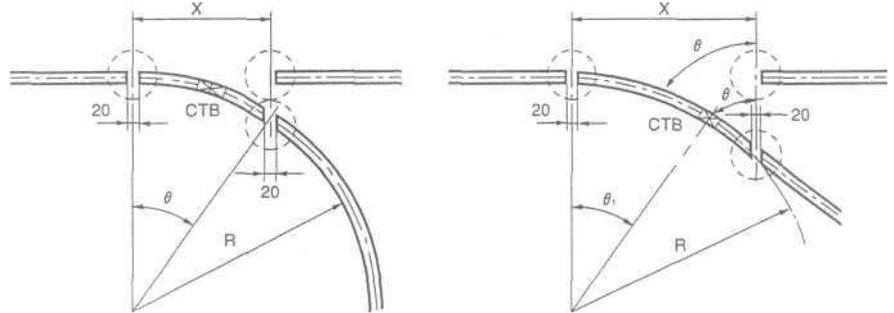
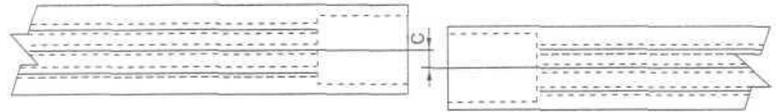
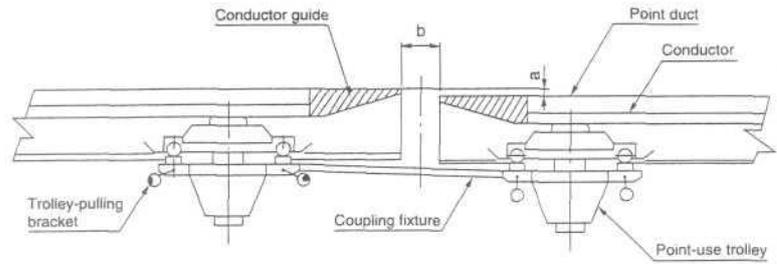
1. Connect the point-use trolleys using a coupling fixture. (For trolley connecting procedures (see page 43).)
2. Use a siowe/-traverse hanger for the point duct (see page 44).
3. Allowable installation errors (during operation, see listed below)

Allowable installation error	
a (level)	3mm max.
b(gas)	10-30mm
c (off)	5mm max.

•Standard point dimensions

Rating		Minimum radius	Φ	Φ_1
Voltage (V)	Port-use trolley	R	Max.	Max.
300V	2P 20A	1200mm	68°	22°
	3P 20A			
	4P 20A			
600V	5P 20A	2500mm	59°	31°
	3P 40A			
	3P 80A			

R	Max. X	
	60A	100A
1200mm	1112mm	1028mm
1500	1390	1285
1700	1576	1457
2000	1854	1714
2300	2132	1971
2800	2595	2399



• Standards for cutting points

CTB: Center feed-in box

Note: Dimensions for X should be determined by checking the spacing between the hoist/l-beam and the duct.

Providing an automatic control circuit

Automated conveyor lines require a control circuit to prevent conveyed items colliding or for automatic elevation of a hoist, in addition to the Trolley Duct for feeding power to the lines. A circuit-separating duct (including a section with no conductors) is used for the control circuit. Consult Matsushita Electric Works for conductor cutting methods and their applications.

•Types of conductor cutting

Name	Conductor cutting point	Symbol
α -type cutting	<p>Conductor 6 (Insulated section)</p>	
β -type cutting	<p>6 120 6</p>	

